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STATE of CALIFORNIA
CALIFORNIA ENERGY COMMISSION

In the matter of,)
2021 Integrated Energy Policy) Docket No. 21-IEPR-06
Report (2021 IEPR)) Re: Energy Efficiency:
) The Role of Energy
) Efficiency in Building
) Decarbonization

IEPR COMMISSIONER WORKSHOP ON THE
ROLE OF ENERGY EFFICIENCY IN BUILDING DECARBONIZATION

REMOTE ACCESS ONLY

TUESDAY, AUGUST 24, 2021

SESSION 1 OF 2: The Importance of Energy Efficiency

9:30 A.M.

Reported By:
Elise Hicks

APPEARANCES

Commissioners Present

J. Andrew McAllister, 2021 IEPR Lead Commissioner

Patty Monahan, CEC Commissioner

Siva Gunda, CEC Commissioner

Clifford Rechtschaffen, CPUC Commissioner

Darcie L. Houck, CPUC Commissioner

Also Present

Jessica Granderson, White House Council on Environmental Quality, Executive Office of the President

IEPR Team

Heather Raitt, CEC, Assistant Executive Director, Policy Development

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Staff Present

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APPEARANCES

Panelists Panel 1

Ken Rider, CEC, Moderator Panel 1

Steve Nadel, American Council for an Energy-Efficient Economy (ACEEE)

Pierre Delforge, Natural Resources Defense Council (NRDC)

Geof Syphers, Sonoma Clean Power

David Jacot, Los Angeles Department of Water and Power (LADWP)

APPEARANCES

Panelists Panel 2

Jessica Allison, CPUC, Moderator Panel 2

Coby Rudolph, CPUC

Ingrid Neumann, CEC

Eric Cutter, Energy & Environment Economics (E3)

Public Comment

Sean Soni, SoCalGas

INDEX

	Page
Introduction	
Heather Raitt, CEC, Assistant Executive Director, Policy Development	7
Opening Remarks	
J. Andrew McAllister, Lead Commission for 2021 IEPR	8
Siva Gunda, CEC Commissioner	17
Patty Monahan, CEC Commissioner	25
Clifford Rechtschaffen, CPUC Commissioner	
Darcie L. Houck, CPUC Commissioner	20
1. Presentation: Federal and California State Action For Building Decarbonization	
Jessica Granderson, White House Council on Environmental Quality, Executive Office of the President	25
2. Panel: The Role of Energy Efficiency in a Decarbonized Future	
Moderator: Ken Rider, CEC	36
A. Steve Nadel, American Council for an Energy- Efficient Economy (ACEEE)	40
B. Pierre Delforge, Natural Resources Defense Council (NRDC)	43
C. Geof Syphers, Sonoma Clean Power	45
D. David Jacot, Los Angeles Department of Water and Power (LADWP)	48
Discussion	51
Zoom Q&A - Moderated by Ken Rider	85
3. Panel: Metrics - Translating Between Efficiency and Emissions	
A. Jessica Allison, CPUC	90
B. Coby Rudolph, CPUC	99
C. Ingrid Neumann, CEC	106
D. Eric Cutter, Energy & Environment Economics (E3)	113
Discussion	120
Zoom Q&A - Moderated by Ken Rider	130

INDEX

	Page
Public Comments	138
Closing Remarks	140
Adjournment	143
Reporter's Certificate	144
Transcriber's Certificate	145

1

P R O C E E D I N G S

1
2 AUGUST 24, 2021

9:30 A.M.

3 MS. RAITT: All right. Well, good morning
4 everybody and welcome to today's 2021 IEPR Commissioner
5 Workshop on the Role of Energy Efficiency and
6 Decarbonization.

7 I'm Heather Raitt, the Program Manager for the
8 Integrated Energy Policy Report, or the IEPR for short.

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

13 The public can participate in the workshop
14 consistent with the direction in the executive order.

15 Today's workshop has a morning and afternoon
16 session, with different log-ins for each.

17 To follow along, the schedule and slide decks
18 are being posted on the Energy Commission's website.
19 They're not there now, but they will be there shortly.

20 All IEPR workshops are recorded and a recording
21 will be linked with CEC's website shortly following the
22 workshop. And then, a written transcript will be
23 available in about a month.

24 Attendees have the opportunity to participate
25 today in a few different ways. For those joining

1 through the online Zoom platform, the Q&A feature is
2 available for you to submit questions. You may also up
3 vote a question submitted by someone else. To do that,
4 click the thumbs up icon. Questions with the most up
5 votes are moved to the top of the queue.

6 We'll reserve a few minutes near the end of the
7 panels to take questions, but likely will not have time
8 to address all the questions submitted.

9 Alternatively, attendees may make comments
10 during the public comment period at the end of the
11 morning and we'll have another one in at the end of the
12 afternoon session. Please note that we will not be
13 responding to questions during the public comment
14 period.

15 Written comments are also welcome and
16 instructions for doing so are in the workshop notice,
17 and written comments are due on September 7th.

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

20 COMMISSIONER MCALLISTER: Okay, thank you very
21 much, Heather.

22 I want to thank everyone for attending. This is
23 going to be a great day, I've really been looking
24 forward to this. And I want to thank Heather and your
25 team, just for just all the competence and, you know,

1 just volunteerism, and professionalism, and just
2 excitement that you bring to all of the IEPR topics, and
3 certainly the ones this year, you know, your team just
4 really shines. It's amazing, you make it look easy and
5 we all know that it's just not easy. It's actually
6 really challenging sometimes to put these high quality
7 workshops together. So, thank you.

8 And also to Division staff, in the Efficiency
9 Division for this day today, and there's another
10 workshop on Thursday. So, today we're looking at energy
11 efficiency, specifically, and I'll make a few comments
12 to sort of locate that topic in the grander scheme of
13 things.

14 On Thursday we're having a workshop, just so
15 that everyone here knows, on Embodied Carbon in the
16 morning, and then HFCs, hydrofluorocarbons, in the
17 afternoon. Those are two really key elements for our
18 carbon transition, our global warming gas reduction.
19 You know, embodied carbon is important, just an
20 expansion of the discussion really into that area, which
21 is taking on more salience. And then HFCs, you know,
22 much of the topic today, the conversation today will be
23 on the proliferation of heat pumps, and so HFCs come
24 along with that and we really need a strategy in
25 reduction, to reduce. So, we're going to talk about

1 that on Thursday.

2 And then, on the 10th of September, we're going
3 to have a workshop on Existing Buildings and Quality
4 Installations. So, the existing buildings are obviously
5 a really huge topic that will definitely come up today.
6 But, you know, really we're going to dig in on the 10th
7 and looking at how we get high quality installations.

8 So, that's sort of the trajectory of the next
9 few IEPR workshops on building decarbonization.

10 I'll note for everyone's attention, as well,
11 tomorrow there is a hearing in the Assembly, Utilities,
12 and Commerce Committee, Assemblyman Chris Holden's
13 Committee, on existing buildings, decarbonizing the
14 existing building stock in California. So, tomorrow
15 afternoon look out for that. And that will be streamed
16 on YouTube, I think, or on the channel, on the
17 Assembly's channel.

18 So, with that we have huge challenges ahead of
19 us in our transition to a carbon-free economy. We also,
20 luckily, have a lot of great technologies, a lot of
21 great programmatic solutions and policies that really
22 are nudging us ever more strongly in that direction.

23 And, you know, we're doing a lot in California
24 to transition to a clean energy economy and a carbon-
25 free economy.

1 I'm really happy to be joined by several of the
2 Commissioners, both in our Commission, at the Energy
3 Commission, and also the Public Utilities Commission
4 that are leading various aspects of that transition.
5 And I believe we have Commissioners Gunda from the
6 Energy Commission and Commissioner Houck from the PUC.

7 Have any of the other Commissioners on this list
8 here joined us, Heather? Commissioner Monahan or
9 Rechtschaffen?

10 MS. RAITT: Not yet. They may be joining later.

11 COMMISSIONER MCALLISTER: Not yet, okay. Okay,
12 great. So, hopefully, they'll have a chance to join us
13 as well.

14 You know, so we're doing a lot to transition our
15 economy. We're also -- you know, we're facing
16 incredible challenges. Everyone who's listening in and
17 certainly all of those of us on the dais, and on the
18 staff of the Commissions, just I think feel a palpable
19 and increasing sense of urgency to get it done. You
20 know, to really try to lead to the best of our abilities
21 in our particular areas of responsibility and oversight
22 to, you know, really face this challenge. We're in a
23 moment where there's an incredible amount of creativity
24 coming to this space. And that's in response to the
25 just spectacular urgency that we have. You know, the

1 heat waves, the fires, the droughts, all of these
2 resources that over the -- you know, over the -- in our
3 lifetimes we've really taken for granted.

4 And we have to question it all and we have to
5 really plan in new ways. We have to come up with
6 solutions that allow us to embrace this breadth of
7 uncertainty that we're facing really every year, it
8 seems, increasingly. You know, just at every scale,
9 really. You know, globally, nationally, regionally
10 across the west, at the state level here in California,
11 and down to the county, and city, and locality. You
12 know, neighborhood and community levels.

13 And then all the way down, you know, if you
14 think about the challenges that individual families and
15 residents face. We just have an overlapping set of
16 concerns that all of us face every day at different
17 levels, and sometimes it's hard to kind of keep our
18 heads around it.

19 And I think the one constant in energy policies
20 throughout the course of my lifetime has been energy
21 efficiency. You know, doing more -- doing, you know, at
22 least as much, but really doing more as our economy
23 grows with less. You know, our per capita energy
24 consumption has remained roughly constant as our, you
25 know, as our economic activity has grown, as our economy

1 has grown and flourished.

2 And so, energy efficiency really was a driving
3 force behind the formation of the Energy Commission in
4 the first place, in the 1970s. Building standards,
5 appliance efficiency standards and that has remained,
6 really, the constant I think, the -- a core component, a
7 core part of the identity of California in the clean
8 energy sphere.

9 So, many of you know we adopted the new building
10 standards for 2022 and are pushing those over, now, to
11 the Building Standards Commission so that they can
12 approve the whole building standards update in December.
13 And that was a big step forward in terms of our pivoting
14 our buildings to a low carbon and clean energy future.

15 So, the focus of the building standards is
16 largely new construction. So, again, the existing
17 buildings are really key. That was a huge step forward
18 and I think, you know, we'll sort of continue that
19 conversation today in the context of energy efficiency
20 specifically.

21 So, we have two statutory -- I'll just set up
22 this conversation, just for everyone's kind edification
23 here. The reason we titled this workshop the Role of
24 Energy Efficiency in Building Decarbonization is that we
25 really have two statutory goals that are complementary,

1 but they're not actually the same thing.

2 Over time, you know, we've had increasing
3 efficiency aspirations and so the SB 350 doubling of
4 energy efficiency goal is one that we've assessed a
5 couple of times now. We've done a lot of analysis on
6 the electricity side, on the gas side, and we've sort of
7 projected forward where we think we're going, how many
8 resources will be necessary to kind of get to a
9 doubling.

10 And so, we've, you know, been planning for this
11 doubling of efficiency savings, trying to figure out
12 what that would take.

13 In the meantime, you know, more recently we have
14 carbon-based goals for the transition of our energy
15 economy, so that's a decarbonization goal. And SB 100,
16 I think is the most sort of salient definition of what
17 that means. And then, we also have the executive order
18 that is economy-wide decarbonization by 2045.

19 So, energy and carbon, as we transition to
20 decarbonized energy systems, energy efficiency and
21 decarbonization, they kind of head in the same
22 direction. You know, we're sort of sailing towards
23 similar waypoints, but they're not exactly the same
24 waypoint.

25 You know, as we decarbonize our electric system

1 and as we shift away from fossil gas to electricity,
2 energy efficiency doesn't necessarily come along with
3 every step of that path.

4 And so, part of the goal today is to kind of
5 unpack that and understand, you know, where efficiency
6 and decarbonization most -- have the most synergies.
7 And certainly, we can call out heat pumps as an example
8 of that, where they're inherently efficient, and they
9 are electric and, therefore, piggy-back on the cleaning
10 up of our electric grid.

11 But we really wanted to dig into that and sort
12 of redefine the efficiency doubling goal in terms of
13 carbon. So, we've shifted our metrics, the way we gauge
14 cost effectiveness and energy efficiency more towards a
15 source energy metric that aligns with carbon pretty
16 well.

17 So, as we make that shift, we want to make sure
18 that we're reflecting that in the SB 350 doubling goal,
19 and doing it in a way that is sort of internally
20 consistent.

21 So, a little bit of the conversation today, the
22 framing of it is pretty California-specific because it
23 really does respond to two statutes in California. But
24 I think it's also helpful to really think about how we
25 can both increase our energy efficiency which, you know,

1 decreases the overall scale of our clean energy problem.
2 Right. If we decrease sort of the demand of energy,
3 then the investments we have to meet that demand go
4 down. I think we've seen that in the SB 100 analysis,
5 that energy efficiency and even load flexibility as it
6 comes alongside energy efficiency can actually decrease
7 the unit cost of electricity. You know, the kilowatt-
8 hour cost goes down at the margins with better
9 efficiency and more flexibility.

10 So, all of these -- these are kind of new topics
11 to some extent. The ability that we have to be flexible
12 with our demand, with our loads is something that the
13 digital economy really enables. And the technology
14 costs are coming down to be able to automate and do
15 communications and controls, you know, down to even the
16 appliance level, certainly the building level.

17 So, we can leverage all these technologies to
18 provide services to consumers and businesses in a way
19 that does manage costs. That does not, you know,
20 compromise the level of service in any way, but that
21 does make it relevant and responsive to the grid needs
22 as well and, therefore, it manages costs and increases
23 reliability.

24 So, efficiency redefined can play a key role in
25 this evolution. And I think we just -- today we want to

1 be -- we want to develop the tools and the language to
2 be more specific about that, about that synergy.

3 And so with that, I think I want to thank
4 everyone for kind of bearing with me on that background.
5 And, you know, this is a fairly California-specific
6 conversation in some ways, but I think it also is just
7 really salient as we think about the scale of
8 investment, and the direction of the investment we need
9 to make in the electricity grid up and down the chain.
10 You know, the smallest demand can sort of shake hands
11 with the bulk power issues, you know, and everything in
12 between.

13 And so, I think setting up our systems, our
14 electric system and our energy systems generally to
15 support that idea is something we can now do, and it's
16 really going to benefit California over
17 time.

18 We have a great set of panelists in the morning
19 and the afternoon today. I'm really excited about this.

20 And with that, I think I'll cede the mic and
21 invite Commissioner Gunda and Commissioner Houck to make
22 some opening comments.

23 Thanks everyone, again, for being here.

24 COMMISSIONER GUNDA: Thank you, Commissioner
25 McAllister. Good morning everybody. This is just a

1 wonderful opportunity to discuss another important
2 thread of this year's IEPR, which is the building
3 decarbonization.

4 I think I just want to begin by thanking
5 Commissioner McAllister's leadership on this year's
6 IEPR, but also his decade-long leadership in energy
7 efficiency and, more broadly, the building
8 decarbonization.

9 And I'm really appreciative, Commissioner
10 McAllister, of the way you framed the discussion today,
11 the evolving nature of efficiency and the confluence of
12 what we are observing between the decarbonization goals
13 and the broader efficiency goals, and how do they make
14 sense as we move forward in a cohesive fashion that we
15 don't leave any of them behind, but work together.

16 It's always an honor and a pleasure to share the
17 dais with you, Commissioner McAllister, and also with
18 the colleagues from CPUC. Thank you, Commissioner Houck
19 for being here today.

20 I want to take this opportunity to thank Heather
21 and her team, and the incredible amount of work that the
22 Efficiency Division has been particularly doing this
23 year with the recent adoption of the Building Code, as
24 Commissioner McAllister noted, and their continued
25 leadership in the building decarbonization work as a

1 whole.

2 I think we have some of the, you know, nation's
3 foremost thought leaders in this Commission and I'm just
4 appreciative of staff's diligence and integrity in
5 pursuing these important goals.

6 As Commissioner McAllister noted, you know,
7 California has a history of leading the nation in energy
8 efficiency. You know, we as Californians use
9 significantly less energy, about 31 percent lower than
10 the national average, which is definitely an indication
11 and close to the state's policies on standards and
12 buildings, efficiency standards for buildings and
13 appliances.

14 I think a couple of things I just want to
15 quickly note and pass it back to Commissioner Houck. As
16 I think through the lens of reliability and then the
17 broader system decarbonization, whether it's electric
18 grid or the natural gas system, I think it's important
19 to note some of the decarbonization barriers we have,
20 especially with the buildings.

21 As Commissioner McAllister noted, you know, 75
22 percent of the residential buildings that we have were
23 built before 1990. And by 2030, fewer than 10 percent
24 of residential buildings will have been built following
25 2019 codes or later.

1 So, that's a lot of old stock of buildings that
2 we really need to think about how do we decarbonize that
3 building stock and really make them a part of the
4 solution.

5 And the importance of energy efficiency is noted
6 everywhere. It still is one of the lowest hanging
7 fruits I know to reduce the carbon footprint of the
8 economy as a whole. And then buildings, you know,
9 through direct and indirect sources still account for
10 approximately a quarter of the GHG emissions.

11 So, it's a very important topic. It's a very
12 meaty topic and a topic that requires all of us to work
13 together.

14 So, I just want to be thankful for everybody's
15 participation. To the panelists for your time to be
16 here and share your knowledge and thinking on how we can
17 move the state forward.

18 Thank you, Commissioner McAllister. With that I
19 yield to Commissioner Houck.

20 CPUC COMMISSIONER HOUCK: Good morning and thank
21 you for including me in today's IEPR workshop. This is
22 a really important issue.

23 I want to also thank the CEC, in particular
24 Commissioner McAllister, for your leadership on the
25 building code standards, and the recent adoption that

1 you had mentioned. That is significant progress.

2 I think, you know, world leaders in California
3 and that work is largely attributed to the Energy
4 Commission and the work that you and the Efficiency
5 Division are doing.

6 I also -- you know, I don't want to repeat the
7 comments that you or Commissioner Gunda had made, but
8 increasing efficiency, while we're looking at how to
9 decarbonize, particularly existing buildings, is going
10 to be critical in meeting our SB 100 goals.

11 And I also wholeheartedly agree there is a
12 sense, of you know, urgency. We are facing climate
13 impacts. And we also need to make sure while we're
14 going forward with our energy efficiency goals and our
15 decarbonization that we're not leaving the most
16 vulnerable communities behind, who disproportionately
17 are going to be living in existing buildings.

18 So, looking at opportunities and programs to
19 decarbonize and electrify existing stock is going to be
20 very important. And I'm excited to hear the
21 conversations today.

22 And I am -- Commissioner Shiroma's our Lead
23 Commissioner on Efficiency at the PUC and Commissioner
24 Rechtschaffen is our Lead Commissioner on the
25 Decarbonization proceeding. I am B-K'ed with both of

1 them in those areas, so I'm excited to be working with
2 Commissioner McAllister and the Energy Commission on
3 those issues, and my fellow Commissioners. And I look
4 forward to hearing the presentations today. So again,
5 thank you for including me on the dais this morning.

6 COMMISSIONER MCALLISTER: Thank you so much,
7 Commissioners. And I'll just make one final note before
8 we kick off. Another complementary sort of input to
9 this conversation, we also adopted at the same business
10 meeting earlier this month, with the Building Standards,
11 was the Assembly Bill 3232 Report. And that was an
12 assessment of the decarbonization kind of pathway for
13 our existing buildings.

14 And I think that's an important input to this
15 conversation. It does sort of highlight, assesses the
16 various strategies to get -- the various pathways, the
17 various strategies that we can pursue to decrease the
18 emissions related to -- you know, from existing
19 buildings.

20 And, you know, it highlights some of the
21 challenges, certainly the opportunities and challenges.
22 In particular, you know, we're getting a better idea of
23 how many resources are going to be necessary to pump
24 into our existing buildings over a sustained period of
25 time. And it's in the billions of dollars per year, you

1 know, globally billions of dollars per year for the next
2 20 years, you know. And so, that's a lot of resources.

3 And to your point, Commissioner Houck, about the
4 equity piece of this, we really need to frame that topic
5 as channeling resources to, you know, the bottom third
6 of residents of the state that really don't have
7 disposable income, or sort of motivation, or ability to
8 -- ability, really, more than -- more than anything to
9 invest in those buildings. You know, they're renters.
10 Even if they do own the building, they don't have
11 disposable income to make that happen.

12 And so, our programmatic approaches really need
13 to focus on, you know, first of all how the state can
14 sort of make the framework appropriate, and provide
15 resources, but also, you know, through a handshake with
16 private sector resources to figure out what those
17 business models could look like.

18 So, those are the topics that -- a little bit
19 today, but also on the -- on September the 10th. And
20 also tomorrow, hopefully, in the Assembly hearing we'll
21 be starting to make some progress there. So, hopefully,
22 you know, that challenge of the existing buildings,
23 which both of you have rightly highlighted, you know, it
24 really -- it really is a -- we have a very large,
25 diverse state and understanding that building stock in

1 order to target programs to the opportunities for energy
2 efficiency is an ongoing challenge, but one we're making
3 progress on. The data environment is improving. You
4 know, at the Commission -- at both Commissioners,
5 really, we're working with much better, more robust, and
6 more granular, certainly, information to understand the
7 building stock and, therefore, design programs that can
8 attack the right problems in a sustained way.

9 So, I'm very optimistic about that. And there
10 are a whole ton of trends that we need to, you know,
11 keep working together on. So, I'm really gratified to
12 have both of you and your colleagues, Commissioner
13 Shiroma and Rechtschaffen, also, and President Batjer.
14 I mean, all the Commissioners at the PUC are committed
15 to this and it's just super gratifying for all of you
16 and your leadership to be engaged.

17 And I have to also recognize Commissioner Gunda
18 for really your amazing ability to connect the dots
19 here. You know, from the macro scale all about the
20 reliability and the bulk power system, and reliability
21 and that realm, with the system, you know, up and down.
22 So, really, really appreciate your being here today to
23 share with us.

24 So, with that I'll pass it back to Heather to
25 get us started. We're lucky to have Jessica Granderson

1 kicking us off this morning.

2 COMMISSIONER MONAHAN: Commissioner McAllister,

3 I know --

4 COMMISSIONER MCALLISTER: Oh, there she is.

5 Hey.

6 COMMISSIONER MONAHAN: -- I am late to the
7 party, but I just wanted to tell you that I am here.

8 COMMISSIONER MCALLISTER: Yeah. Well, please go
9 ahead.

10 COMMISSIONER MONAHAN: I'm looking forward to
11 today's workshop.

12 COMMISSIONER MCALLISTER: Great. Sorry about
13 that. Did not see that you join. Thanks for being
14 here, this is great.

15 Okay, so with that back to you, Heather, and
16 kick us off with Jessica Granderson.

17 MS. RAITT: Great.

18 COMMISSIONER MCALLISTER: From the White House.

19 MS. RAITT: Okay. Super, thank you so much.
20 Yes, I'm very pleased to introduce Jessica Granderson.
21 She's the Director for Building Technology at the White
22 House Council on Environmental Quality, in the Executive
23 Office of the President.

24 So, we're very pleased to have you here,
25 Jessica, go ahead.

1 MS. GRANDERSON: Thank you, Heather. Good
2 morning. Thank you, Commissioners, for having me. It's
3 really a pleasure to kick things off with you today.

4 I am currently working at the White House
5 Council on Environmental Quality, on the Building
6 Emissions and Community Resilience Team, on leave from
7 my position at Berkeley Lab.

8 It's a privilege to be working for the
9 Biden/Harris administration as we all collectively seize
10 the moment in front of us to meet the challenges of
11 climate change and environmental justice.

12 And I'm glad for the opportunity to address you
13 all today, recognizing the nation-leading work that
14 California continues to do. We're a ground zero for
15 climate-driven disasters, but also for innovation in the
16 policy, technology, and programs that are confronting
17 those challenges head on.

18 So, I want to tee up four areas that are front
19 and center in pretty much any conversation about
20 building sector decarbonization, and share with you
21 relevant activity at the federal level and its
22 relationship to work here in California.

23 So, we'll talk some about equity,
24 decarbonization of electricity supply, electrification,
25 and efficiency.

1 President Biden has made historic commitments to
2 use every lever at his disposal to advance environmental
3 justice and spur economic opportunity for disadvantaged
4 communities.

5 And the new Justice 40 initiative is core to
6 that commitment. It gives us a mechanism to ensure that
7 our federal agencies do the work with state and local
8 communities, so that we can deliver at least 40 percent
9 of the benefits from our federal investments in climate
10 and in clean energy back to our disadvantaged
11 communities.

12 Just last month the administration's Office of
13 Management and Budget, Counsel on Environmental Quality,
14 and Office of Domestic Climate Policy issued
15 implementation guidance for agencies, launched the
16 Justice 40 pilot program, and introduced accountability
17 and transparency tools to support agencies in their
18 success.

19 As equity is centered in the executive agenda,
20 it's also prioritized in California's current activities
21 and future plans. We know that it's more important than
22 ever to ensure that our most vulnerable, our black and
23 brown, and frontline communities do not continue to bear
24 the brunt of climate change. And that they be fully
25 engaged in the design and implementation of our

1 solutions to adapt and mitigate the impacts.

2 Building electrification, for example, is going
3 to really require a doubling down of attention to ensure
4 that our intentions are truly realized in people's lived
5 experience. And California, like in so many things, has
6 a great leadership role to embrace here.

7 So, how are we going to decarbonize the building
8 sector in California, but also nationwide? One of the
9 most important drivers, of course, is going to be
10 decarbonization of electricity generation. It's how we
11 will get at those indirect, scope-to-emissions that we
12 attribute to the use of electricity in our buildings.

13 Now, over the last decade and some, the
14 emissions intensity of California's electricity sector
15 has decreased dramatically. And that's really due to
16 policies, like our renewable portfolio standard,
17 emissions performance standards, and a host of other
18 factors.

19 And California's RPS requirements will only
20 escalate to 60 percent in 2030, and 100 percent
21 renewable and zero carbon resources by 2045.

22 This carbon-free electricity goal mirrors those
23 being pursued at the federal level by the
24 administration, where we're targeting an 80 percent
25 carbon-free electricity supply by 2030 and 100 percent

1 nationwide by 2035.

2 As we continue to drive that grid side
3 decarbonization, electrification of our demand side
4 loads is going to become more and more important to
5 bringing home full decarbonization of the building
6 sector. It's how we're going to get at those direct,
7 onsite, scope one emissions.

8 So, two critical issues that we know we'll face
9 in any aggressive electrification scenario. One, the
10 cost to retrofit existing buildings. And, second,
11 technology availability. For example, heat pumps for
12 large commercial and for cold climate applications.

13 To address these challenges we'll need a
14 coordinated complement of activities that target
15 financing, retrofit interventions, market
16 transformation, and technology development.

17 And finally, efficiency. This is our tried and
18 true strategy that's brought us extraordinary consumer,
19 system, and greenhouse gas benefits for decades. And
20 it's going to remain critical to our success in
21 decarbonization. Our building energy codes will
22 continue to ratchet. And they can be used to push
23 broader adoption of heat pump space and water heating.
24 California is already leading in this regard.

25 Efficiency will continue to play a role in

1 controlling demand in the face of that growth of
2 electric loads from electrification with material
3 benefits to customer costs, system costs, and
4 reliability. And that's particularly true when paired
5 with load flexibility.

6 And then, those same co-benefits of comfort,
7 health, and productivity that we've always looked to
8 will still be delivered, even as they remain somewhat
9 difficult to quantify and appropriately value.

10 Now, just as a sidebar, for those of you who
11 know me, you know that I'm always interested in how
12 we're measuring and quantifying the performance and the
13 impacts of our building improvement efforts. And as
14 decarbonization comes into play as a, if not the primary
15 indicator of success, it's going to be essential for us
16 to constantly evolve how we're thinking about cost-
17 benefit and evaluation constructs, and how we're
18 thinking about value streams and metrics.

19 Now, we're like simultaneously looking to
20 understand customer, and energy, and emissions impacts
21 at multiple levels of resolution, with all sorts of
22 implications for data acquisition, modeling, and
23 longitudinal tracking. And that's going to be really
24 fun to unpack, but also pretty thorny to figure out in
25 the face of this constant urgency to act now.

1 California is already doing so much to advance
2 equity and building decarbonization. And I want to talk
3 about a few administration priorities that can be
4 brought to bear in either amplifying those efforts or
5 enabling others to do similarly.

6 The president's Build Back Better Agenda will
7 invest in our communities and expand access to
8 affordable housing by building, preserving, and
9 retrofitting more than 2 million homes and commercial
10 buildings.

11 In support of that agenda, the bi-partisan
12 infrastructure bill that has passed the Senate and is
13 now going to the House contains several items of note.
14 The first being three and a half billion dollars in
15 funding for the Weatherization Assistance Program.

16 Another billion plus for Energy Efficiency
17 Conservation Block Grants, and grants to our nation's
18 public schools.

19 That follows with another half billion or so for
20 grants to capitalize State Revolving Loan funds, and for
21 energy and resilience code implementation across the
22 country.

23 There's also a \$40 million allocation to train
24 energy audits as a down payment on the massive workforce
25 investments that we know we're going to need to meet our

1 sector-wide goals.

2 There's also a couple efforts that we're
3 pursuing within the Building Emissions and Community
4 Resilience Portfolio at the CEQ that I want to be sure
5 to mention. And first is building performance
6 standards.

7 We see BPS as truly transformative policy that
8 allows us to move from new construction and major
9 renovation to be able to address existing buildings.
10 They're as-operated-performance across the 50 plus years
11 of their lifecycle, nationally 75 percent of our 2050
12 stock is already built and in operation. So, we know
13 how important these kinds of levers will be.

14 We were proud to announce earlier this summer
15 the first ever building performance standards for the
16 federal stock, and the interagency work to develop that
17 standard has begun with representatives from the GSA,
18 VA, Department of Energy, EPA, and Department of
19 Defense.

20 And we're first looking internally to ensure
21 that the federal government leads by example. But we're
22 also exploring how we can partner with state and local
23 governments to accelerate the uptake of building
24 performance standards nationally.

25 I was really happy to see there's a session on

1 this later today. And to note that Chula Vista is one
2 of the nation's earliest adopters of this kind of policy
3 and there's certainly potential for further uptake in
4 California.

5 Second, we're making sure that we lean very
6 heavily into advancing building energy codes nationally
7 and for federal programs, improving the performance of
8 new and affordable housing. In July, the Department of
9 Energy released final determinations for ASHRAE 90.1
10 2019, and the IECC 2021.

11 That was followed in July by HUD sharing with
12 stakeholders that they had begun the process of
13 developing a proposed determination in consideration of
14 those new codes for the HUD and USDA covered programs.

15 And just now, in August, DOE posted a pre-
16 publication Federal Register supplemental notice for a
17 proposed rule to establish energy conservation standards
18 for manufactured housing.

19 Third, we've launched a full portfolio of
20 interagency work targeting coordinated federal action on
21 resilience. That's coastal resilience, flood, wildfire,
22 extreme heat, and drought. Of this collection, the most
23 related to building decarbonization is our work in
24 extreme heat.

25 For example, just a couple weeks ago we held a

1 stakeholder meeting on the intersection of buildings,
2 extreme heat, equity, and decarbonization. And the
3 objective was to inspire replication of innovative urban
4 heat mitigation strategies at the municipal level, while
5 also giving our federal agencies an opportunity to hear
6 directly from those implementing these solutions so they
7 can better inform meaningful federal action.

8 So, in closing, I really want to emphasize that
9 it doesn't really matter where you look these days. It
10 could be the new IPCC Report, our enduring drought
11 conditions, you know, the fires and heat waves that
12 we're living through. The urgency that we're all
13 feeling to act aggressively, quickly, and with a laser-
14 focused intention has never been greater.

15 And personally, I'm continuously encouraged by
16 the response and the redoubling of efforts that we're
17 seeing across the country from the federal, to the
18 state, and local level, and back again. California's
19 ongoing leadership and partnership is so critical to
20 meeting our national goals, as well.

21 And I'm really looking forward to today's
22 sessions. And thank you for your attention this
23 morning.

24 COMMISSIONER MCALLISTER: Thank you very much,
25 Jessica. We really appreciate your being here and your

1 really taking the time from LBL up to the federal level,
2 and just bringing all your expertise to that, to the CEO
3 and the administration is just such a -- such a
4 wonderful -- you know, it's in tune with the great
5 appointments that the administration has made really
6 across the board in this space.

7 But really thank you for stepping up and, you
8 know, just rolling up your sleeves and getting to work
9 with us. And we really look forward to having
10 increasing collaboration with you and the team there
11 going forward.

12 And really happy to hear about the manufactured
13 housing initiative and really, also, looking forward to
14 working with you on metrics, and some of the data issues
15 as well. So, thanks for being here.

16 I would love to be able to ask you more
17 questions, but I think we're already about seven minutes
18 overtime. If you have a chance to listen in and maybe
19 even take a few questions after the first panel, that
20 would be great. And we understood if you don't but --

21 MS. GRANDERSON: Thank you, Andrew.

22 COMMISSIONER MCALLISTER: Sure. Okay, well
23 thanks for being here with us, appreciate that.

24 Okay, Heather, back to you.

25 MS. RAITT: Sure.

1 COMMISSIONER MCALLISTER: And moving on with Ken
2 Rider and the first panel. So, thanks a lot.

3 MS. RAITT: All right. Super, yeah. So, yes
4 we'll just continue the conversation with Ken Rider on
5 the first panel, on Energy Efficiency and a Decarbonized
6 Future. And Ken is the Chief Policy Advisor to Chair
7 Hochschild at the Energy Commission.

8 So, go ahead, Ken.

9 MR. RIDER: Yeah, good morning everyone. Yeah,
10 I'm the moderator for the first panel of today's
11 workshop, which has the very exciting title of The Role
12 of Energy Efficiency in a Decarbonized Future.

13 One of the first things I learned working at the
14 Energy Commission is that energy efficiency is the
15 cleanest and cheapest way to meet our energy needs. And
16 that remains true today.

17 But however, you know, an ever-increasing focus
18 on greenhouse gas reduction has implications to the
19 strategic deployment of energy efficiency. While energy
20 efficiency can reduce greenhouse gases directly, it also
21 has an important role of bringing the decarbonization of
22 the grid, buildings, and industry within manageable
23 parameters. In other words, energy efficiency makes our
24 challenges smaller in size and, therefore, easier to
25 overcome.

1 Next slide, please. To illustrate this
2 principle, I put together a chart of different resource
3 mixes in 2030 and 2050 using E3's Pathway Model. The Y-
4 axis for the chart there is the capacity of California
5 in gigawatts. In both 2030 and 2050 there are two
6 scenarios plotted.

7 One is named CEC 2050, which was a core scenario
8 used in the work that CEC funded and has very aggressive
9 energy efficiency embedded.

10 And the other is called CEC 2050 1 x AAEE, which
11 stands for additional achievable energy efficiency. And
12 that scenario has less energy efficiency.

13 And you can see that the difference between
14 those amounts of efficiency results in very different
15 amounts of needed capacity. The 2030 scenario here is
16 showing a difference of 15 gigawatts of capacity and the
17 2050 scenario shows a difference of 45 gigawatts of
18 capacity, or roughly 15 percent difference in each case.

19 Now, to put that into context, you know, a rule
20 of thumb for capacity, you can assume about \$1 billion
21 cost per gigawatt. And so, you can imagine there that
22 we're talking on a scale of \$15 billion in 2030 and \$45
23 billion in 2050, not including transmission and other
24 costs. So, that's a lot of avoided capital cost.

25 Now, this is just one tool and one set of

1 analyses, and there have been others that have followed
2 since Pathways, but it's demonstrative of two important
3 things. Even if all the greenhouse gases were gone from
4 the electricity grid, energy efficiency can reduce
5 capital costs and raise the affordability of the grid.
6 It can also still provide impressive environmental
7 benefits by avoiding unnecessary power plants. Next
8 slide.

9 This chart also shows why energy efficiency
10 needs to be considered first in order to gain maximum
11 benefit. If we follow the red or upper pathway and
12 focus on building, let's say, the 15-gigawatt larger
13 system from the previous slide, and then as a secondary
14 effort to reduce demand, we end up with an overbuilt
15 system and miss-timed the opportunity to save capital
16 costs.

17 Conversely, benefits can be maximized by
18 focusing on deploying energy efficiency and demand
19 reduction first, and then building the capacity for what
20 remains.

21 While this is already recognized in the loading
22 order, its importance is even greater with a grid that
23 is comprised mostly of fixed cost assets like solar PV
24 plants, instead of more variable cost resources like
25 natural gas power plants.

1 This balancing act is actually one of the
2 original tasks given to the Energy Commission, where we
3 used the demand forecast to balance the need of new
4 resources in light of demand reduction programs like
5 energy efficiency. The next slide, please.

6 A similar principle applies to building and
7 industrial decarbonization. Take, for example, a home
8 that carbonizes its HVAC system, its heating and
9 cooling, in one year, and then chooses to upgrade its
10 insulation the next year, as illustrated by the red
11 upper pathway.

12 Just as in the grid example, that pathway leads
13 to unnecessary costs and worse environmental outcomes.
14 That's because upgrading the insulation first allows for
15 smaller capacity heating and cooling equipment to be
16 installed, saving both money and lowering the amount of
17 refrigerant needed. Again, the differences in costs and
18 benefits points to the importance of considering
19 efficiency first. The next slide, please.

20 Efficiency is also a cornerstone strategy to
21 building decarbonization. This graphic comes from the
22 Energy Commission's recently adopted California Building
23 Decarbonization Assessment, conducted for AB 3232.

24 The assessment used efficient heat pump electric
25 equipment as a basis for its electrification pathways to

1 building decarbonization. What this chart shows is that
2 even with the more efficient equipment set significant
3 energy and bill cost savings can be achieved by pushing
4 energy efficiency further by using the best technologies
5 that we have.

6 In this specific analysis conducted using the
7 aggressive electrification scenario, efficiency could
8 avoid 19 percent of the additional electricity needed
9 and reduce bills by \$2.2 billion annually.

10 Therefore, energy efficiency opportunities
11 remain large in the effort to decarbonize and key to
12 keeping costs low.

13 And with that, let's move on to our panelists.
14 Each will give some initial remarks and then we'll move
15 on to discussion.

16 I would like to introduce our first panelist,
17 Steven Nadel, Executive Director of the American Council
18 for an Energy Efficient Economy.

19 Go ahead, take it away Steve.

20 MR. NADEL: Okay, thanks Ken. Thanks
21 Commissioners. I look forward to the discussion here.

22

23 And if you can just go to the next slide and
24 we'll be brief here with the opening remarks.

25 I think a lot of you know ACEEE. We're a 40-

1 year old organization that does research, education, and
2 program policy, technical assistance, and advocacy. Ne
3 next slide.

4 A couple of years ago we did a study looking,
5 and this is national, not just California, and we found
6 that energy efficiency can get us halfway to
7 decarbonization. That worked out to be 50 percent
8 reduction in energy use and also 50 percent reduction in
9 greenhouse gas emission. Next slide.

10 And here you could see how those savings are
11 split out. I'm going to particularly point out the
12 blue, what are the building blocks. It's zero energy in
13 commercial buildings, zero energy new homes. You could
14 substitute zero carbon instead of energy, if you want.
15 Smart buildings and homes. Building retrofits as well
16 as home retrofits, and then electrification. But all of
17 these things act in tandem, together. It's about a
18 quarter of the savings. Oh, and the purple is appliance
19 and equipment efficiency standards, most of which is in
20 buildings, but some of which is industry as well. So
21 together that's more than like a third of the savings,
22 greenhouse gas savings that can come from efficiency.
23 Next.

24 One of the reasons to do efficiency is that it
25 is generally cheaper. On the far left shows energy

1 efficiency, the average cost from our most recent study.
2 And LBL did a very similar study and came up with a very
3 similar figure. It works out to about 2.4 cents
4 levelized per kilowatt hour. Even renewables, generally
5 a little bit more expensive, obviously the other sources
6 have even more. But efficiency tends to be low cost and
7 this doesn't even include the cost of storage for a lot
8 of the renewables. The next one.

9 As Ken pointed out, efficiency reduces the size
10 of systems, reducing costs. Next slide.

11 And in California, peak demand is expected to
12 increase both summer and winter, and efficiency can help
13 reduce those costs, the amount of power that needs to be
14 built, as Ken pointed out.

15 Skip the next slide and go to the slide after
16 that. And I'd also point out that efficiency really
17 helps with personal comfort, whether it's reducing
18 radiation from people, which depends on the temperatures
19 of surrounding surfaces. Think insulated walls, rather
20 than un-insulated walls. Convection and air motion,
21 think infiltration, as well as evaporation, think
22 humidity control. So, these are things that should be
23 addressed, that efficiency can address.

24 Final slide. So, my conclusion for now is that
25 efficiency and renewables are like peanut butter and

1 jelly, it's hard to do one without the other.

2 And with that, I'm happy to hear the other
3 people and look forward to the discussion in terms of I
4 can add a few things on both the federal reconciliation
5 package, as well as some thought from our research about
6 areas that California can pursue. So, thank you.

7 MR. RIDER: Thank you, Steve, good points.

8 And next we will hear from our next panelist.
9 Pierre Delforge, Senior Scientist at the Natural
10 Resources Defense Council. Welcome Pierre.

11 MR. DELFORGE: Thank you, Ken. Good morning
12 Commissioners, good morning staff, and everybody. So,
13 I'm Pierre Delforge, at the NRDC, Natural Resources
14 Defense Council, where we focus on mitigating the
15 climate crisis and safeguarding a future that is clean,
16 equitable, healthy, and prosperous for all people.

17 So, energy -- so, NRDC has a long legacy in
18 energy efficiency. My colleagues have been roaming the
19 halls of CEC and CPUC for decades. And I stand proudly
20 in that tradition.

21 But energy efficiency also needs to evolve to
22 meet the moment, and in particular two of the main
23 crises that we are facing today, the climate crisis and
24 the racial and social equity and justice crisis.

25 So, on climate we need to -- you know, our goal

1 is to get to zero emissions and that means that we need
2 not just to consume less energy -- by the way what --
3 can you please move to the next slide? I only have one
4 slide, so might as well show you. Thank you.

5 So, to meet the climate crisis we need to evolve
6 from, you know -- energy efficiency is still fundamental
7 and we need to continue to deploy it as, you know,
8 smartly and strategically. But we also need to use
9 clean energy with electrification being the primary
10 solution to do that. And we need to do it in a way that
11 enhances and supports the grid decarbonization, so using
12 energy at the right time.

13 Energy efficiency also needs to help meet the
14 equity and justice crisis because, not just -- mostly
15 because of equity's sake, right, it's just the right
16 thing to do to ensure that the benefits of energy
17 efficiency are accessible to all. But also because, you
18 know, low- and medium-income households make up 43
19 percent of all U.S. households, and we cannot
20 decarbonize and meet our decarbonization goals without
21 focusing, you know, on this sector.

22 The underserved communities are the ones who
23 need energy efficiency the most, and they also are the
24 ones who are the least able to afford it, and who are
25 the most at risk of being left behind.

1 So, it is critical that our energy efficiency
2 policies focus on addressing this sector in order to be
3 able to scale to the level that we need it.

4 So, this framework informs NRDC's priorities for
5 energy efficiency and building decarbonization. I know
6 I'm short of time, so I'm not going to cover those
7 priorities in this opening statement, but would love to,
8 you know, mention and discuss them in our discussion.
9 And two aspects in particular. One is market
10 transformation and the other one is about retrofitting
11 affordable housing.

12 So, with this I'm going to pause here and look
13 forward to the discussion.

14 MR. RIDER: Thank you so much, Pierre.

15 Our next panelist is Geof Syphers. He's the CEO
16 of Sonoma Clean Power. Geof, go ahead and unmute and
17 tell us about --

18 MR. SYPHERS: Good morning and thank you, Ken,
19 and thank you Commissioners. Many of you already know
20 Sonoma Clean Power. We're a public power CCA, serving
21 Sonoma and Mendocino counties.

22 And for today I'll spotlight the Advanced Energy
23 Center we've recently built and in a partnership with
24 the Energy Commission to provide zero interest on-bill
25 financing for people making the transition to super

1 efficient appliances, and away from burning fossil
2 methane.

3 And think after our first hundred retrofit
4 projects in the last couple of months, we're starting to
5 learn about what's working with that transition. So,
6 I'll share some of those highlights.

7 First, we're learning that we really do need the
8 pair deep energy efficiency to make decarbonization
9 affordable. You're going to hear that theme a lot, I'm
10 sure. Simple appliance changes are the easy part. But
11 that overall efficiency package on buildings is often
12 needed to avoid having to upgrade an electrical panel,
13 or even a neighborhood transformer.

14 And those avoided costs, we're finding, can be
15 significantly larger than all other costs on the
16 project, and so we really need to take those into
17 account.

18 Second, we're learning that induction cooking is
19 a surprisingly effective way to get into efficiency and
20 decarbonization. By encouraging people and engaging
21 them on how they cook, it opens a dialogue about water
22 heating, and space conditioning, and electric cars, and
23 everything.

24 So, I'd highlight we check out portable
25 induction kitchen burners, and that is amazingly

1 effective at getting people to actually upgrade to
2 cooking with induction.

3 Third, we're learning that home retrofits are a
4 really good time to add demand response capabilities.
5 And I know we're mainly talking about efficiency in this
6 forum, but we need to be cautious not to end up
7 hardening demand. That's that dangerous place our water
8 districts are in right now by having promoted water-
9 efficient toilets and irrigation, only to watch cities
10 issue new building permits, and bring usage back up to
11 previous levels. And so now, they're finding it harder
12 and harder to conserve during a drought because the
13 demand is hardened.

14 And that kind of demand hardening can also
15 happen with electric energy. And so, creating that kind
16 of flexibility with dispatchable controls, and phone
17 apps that allow us to pay customers to change their
18 usage patterns, all of that becomes incredibly valuable.

19 And one immediate advance we can make to address
20 summer capacity issues would be to integrate into our
21 grid-savvy demand response program all the devices that
22 other providers have incentivized in our territory, like
23 PG&E, which are currently uncontrolled. And we just
24 need that data to list those devices and start
25 dispatching them for flex alerts.

1 And I think, lastly, cities are really looking
2 to use deep efficiency to upgrade neighborhoods to all-
3 electric buildings. And they've identified the
4 potential avoided cost of gas line infrastructure
5 repairs as a financial means to that transition, but
6 have been stymied by a lack of data from the IOUs about
7 the gas infrastructure costs and conditions.

8 And so, having good access to that gas cost data
9 will be incredibly valuable in achieving affordable
10 transition.

11 Thanks.

12 MR. RIDER: Thank you, Geof. That's great.

13 Now, our next panelist is David Jacot. He's the
14 Director of Efficiency Solutions for the Los Angeles
15 Department of Water and Power. Take it away, David.

16 MR. JACOT: All right, Ken, thanks so much, and
17 thanks Commissioners. It's a pleasure to be here.

18 So, Geof comes from the CCA world. I come from
19 the still vertically integrated municipal world, so it's
20 interesting to see the perspectives. But I'm very
21 heartened by all the discussion thus far and I won't
22 spend a lot of time preaching to the choir on the value
23 of energy efficiency, except how we're operationalizing
24 it here at DWP. The next slide, please.

25 So, we've partnered with NREL to study how to

1 make the entire grid decarbonized by 2035, and we came
2 up with a very detailed scenario analysis that shows
3 it's feasible. But it also has a wide range of costs,
4 between \$50 and \$80 billion. Obviously, we want to be
5 at the lower end of that, as opposed to the higher end.
6 How do we get there? Energy efficiency is how we get
7 there.

8 Distributed energy resources, and energy
9 efficiency in particular make everything smaller. We've
10 heard that already, but I'll say it again.

11 The other key is that we need electrification to
12 get more revenue kilowatt hours to spread these costs
13 across. So, it's a twofold strategy here where
14 electrification, transportation and buildings,
15 transportation is really the largest opportunity, but
16 buildings are significant as well, props up our revenue.
17 So, it gives us more kWhs to spread the fixed cost
18 across, and energy efficiency makes those fixed costs
19 smaller. Next slide, please.

20 So, I won't belabor this one, except to point
21 out the green lines. The green lines are what matter on
22 this slide. This was the scenario analysis of the
23 potential rate impacts from the LA100 Study, the ten
24 different pathways we looked at. The green lines are
25 the important ones.

1 The bottom green line, that's the cheapest,
2 that's the least rate impact and that is our complete
3 decarbonization of the grid by 2035, with a high level
4 of electrification revenue.

5 The top line, the top green line is the same
6 thing with low electrification. And so, it's
7 dramatically different. We see us topping out around 25
8 cents a kilowatt hour out by 2045, with the optimal
9 scenario. And if we don't have the electrification we
10 need for the revenue, the rates go through the roof and
11 they go through the roof quickly.

12 So, it's two sides of the same coin here again.
13 We need the electrification to bring the revenue and we
14 need the energy efficiency to reduce the infrastructure,
15 the infrastructure needs.

16 One other point I'd make, and we can elaborate
17 more on this in the discussion, is that I see the time
18 sensitivity of energy efficiency going down somewhat as
19 we have more, and more, and more storage, both
20 distributed and utility-scale storage.

21 Energy efficiency in the afternoon will become
22 important again because we'll want to save as much of
23 that renewable generation to get through the night. And
24 energy efficiency at 4:00 in the morning will be
25 important again so we don't need so much storage to get

1 through the night. So, I actually think the time
2 pressure on energy efficiency is going to decline as we
3 get more and more storage on the system.

4 Thank you.

5 MR. RIDER: That's great. Thank you for the
6 presentation.

7 So, we'll move on to panel discussion. I have a
8 few questions and so we'll start with Steve: Can you
9 tell us more about ACEEE's priorities for energy
10 efficiency and building decarbonization at the national
11 and state level?

12 MR. NADEL: Sure. So, we are particularly
13 working at the moment on the federal level because there
14 is so much opportunity. Maybe later I can talk a little
15 bit about some of the things that are very much in play.
16 But we are looking at what can we do in the bipartisan
17 infrastructure bill and the reconciliation bill to
18 dramatically scale up funding for buildings, retrofits,
19 also the tax credits for new and existing buildings.
20 There's also a lot we're doing on industry and
21 transportation and that's kind of beyond the focus here.

22 But at the state level we are working on how to
23 get more states to adopt appliance efficiency standards,
24 following the lead of California. How to get states to
25 move towards zero net energy codes. And I say zero net

1 energy because most states that's the data they have.
2 Zero net carbon is absolutely fine. I think eventually
3 a lot of states will do that, but most of them don't
4 have the data.

5 And then just in general, support energy
6 efficiency programs, particularly as Jessica pointed
7 out. Retrofits, if we're going to decarbonize we really
8 have to do a much better job on our retrofits and what
9 we can do with our homes -- with our multifamily
10 buildings, with the commercial buildings. Those latter
11 two I particularly point out the opportunity when
12 existing buildings need to go through major renovations,
13 typically every 20 years, and have you do a deep
14 retrofit there.

15 So, that's a summary of some high points, and
16 why don't I stop there.

17 MR. RIDER: Thank you very much, Steve.

18 I'd like to ask Pierre: What are -- can you
19 build on and what are some of NRDC's priorities for the
20 equitable building decarbonization you mentioned?

21 MR. DELFORGE: So, thank you, Ken. I mentioned
22 to major priorities. When is market transformation and
23 the other one is affordable housing retrofits. The
24 market transformation is critical to get the
25 decarbonization technology solutions that we need to be

1 affordable and available so that they can scale at, you
2 know, the pace and scale that we need.

3 We've been doing a lot of work and there's still
4 some to do on removing regulatory barriers, like three-
5 pong test, and some of the building code barriers that
6 were removed back in the previous code cycle, in 2019.
7 There's still a few, like line extension allowances and,
8 you know, cost effectiveness metrics, and others that
9 are stymieing the level of funding that we are able to
10 put out there. AB 3232, the report that the Energy
11 Commission put out recently makes it clear that the
12 longer the wait, the more expensive it is going to be to
13 decarbonize buildings because we're going to have to
14 have more early replacements versus replacement on burn
15 out.

16 So, the sooner we invest and the more we invest
17 now, the easier and the cheaper it's going to be to
18 decarbonize buildings. So, really need to scale up the
19 investments in energy efficiency and decarbonization,
20 and look at vehicles like the TECH Program, the SGIP
21 Program that are being rolled out or soon to be rolled
22 out, and look at how these vehicles can be used to
23 really scale investments in market transformation.

24 And this is a quick, last point to the other
25 part of our priority is around affordable housing

1 retrofits. So, market transformation is important, but
2 for those, you know, communities who cannot participate
3 in markets, others who are renters, or who just don't
4 have the means to, you know, install new systems we
5 really need to have policies that fund retrofits of
6 particularly affordable housing. And we're looking at
7 programs like the Low-Income Weatherization Program, the
8 Energy Assistance -- the Energy Savings Assistance
9 Program to be key vehicles to help those communities
10 transition off the gas system, so they are not left
11 behind on the system as it is, you know, other customers
12 transition away and volume reduces, and costs increase.

13 MR. RIDER: Thank you, Pierre.

14 A question for -- maybe we'll do Geof and then
15 David. You know, as folks with customers, can you tell
16 us a little bit more about your plans to connect your
17 customers to efficiency in these decarbonization
18 opportunities.

19 MR. SYPHERS: Sure. Well, you know, I think our
20 construction of the Advanced Energy Center is a great
21 experiment and so far, so good, despite that it is a
22 physical storefront during COVID. We're actually
23 getting about 20 people a day dropping in, and many more
24 online.

25 And I think having that kind of tactile

1 experience where people can see what we're talking
2 about, trying out cooking with induction, literally look
3 at what a heat pump water heater is and how normal it
4 looks compared to a regular water heater, that takes a
5 lot of the mystery out of things. And I think that's
6 really critical.

7 And I wanted to pick up on something that David
8 just mentioned about time of efficiency not being so
9 important. I think that's right generally. But one of
10 the things we're finding in working with customers on
11 going either off-grid or building a 100-percent
12 renewable microgrid is that winter efficiency is the
13 cost driver, because that is anti-correlated with solar
14 output.

15 And so one of the things, if we're scaling up
16 these little projects to thinking about the big grid,
17 we're going to have to start caring about the wintertime
18 efficiency because that's what drives the cost of
19 storage, and much more than summertime.

20 And so, there might be a seasonal efficiency
21 more than a time-of-day efficiency, so I wanted to pick
22 up on that.

23 MR. RIDER: Good point. David?

24 MR. JACOT: Yeah, I think that's a great point.

25 You know we talk all the time about the intermittency of

1 renewable generation and we usually think in diurnal
2 terms, but seasonal is every bit as important, if not
3 more so, especially when we're looking at having to
4 store for a week or two weeks of cloudy weather. So,
5 absolutely that's a consideration.

6 A couple of thoughts. I'm going to be a little
7 bit contrarian here and highlight something that, you
8 know, I showed on the rate graph earlier.

9 If you recall from the upper green line on the
10 rate graph, we need massive -- we need massive
11 electrification revenue coming onboard in the next three
12 to five years. Buildings are very important, but the
13 churn rate on buildings and the major renovations that
14 Steve mentioned, we're not necessarily going to be able
15 to count on building electrification to give us what we
16 need in terms of a revenue bump to make the 2035 target.

17 Transportation electrification is where our
18 largest focus is. It's already economical for the
19 customer. We don't have questions about what the energy
20 burden -- you know, what direction the energy burden
21 goes in pre- and post-electrification. Products are
22 available, with the challenge is simply getting the
23 market awareness and the chargers out there.

24 Building electrification is much more
25 complicated. You know, we all agree it needs to happen,

1 it needs to happen aggressively. We don't think
2 building electrification's going to happen fast enough
3 to give us that revenue bump we need. And so,
4 transportation electrification is a huge, huge push
5 since it's already economical and there's no questions
6 on the energy burden.

7 That said, what are we doing on the
8 electrification side, the building electrification side?
9 And we are in the process of launching what we call the
10 Comprehensive Affordable Multifamily Retrofits Program,
11 which is -- basically, it's our take on the state's LIWP
12 program, the Low-Income Weatherization Program that's
13 run by California CSD, Community Services Department.

14 And it is going to have a heavy focus on
15 building decarbonization. In fact, that's how the
16 rebate structure is phrased. It's that, it's in terms
17 of GHG reduction.

18 So, deep energy efficiency combined with
19 building electrification, combined with onsite renewable
20 storage, and that's -- renewable generation, with
21 storage, EVs and demand flexibility to be built in
22 subsequently.

23 So, the beauty of it is you get the deep energy
24 efficiency, which makes the bill go down, and electrify
25 which may make the bill go up, but then you offset that

1 with the onsite generation which, again, then makes the
2 bill go down.

3 So, overall the energy burden is less but it
4 combines those three in that order. Deep energy
5 efficiency first, electrification second, onsite
6 renewable generation third.

7 And then, like I said, we plan to build in -- as
8 we get to having a standard around battery storage
9 systems, we'll add that in, and we can add in other
10 modules, if you will, as well. And we hope to get that
11 launched here in the next few months.

12 MR. RIDER: So, just to follow up really quickly
13 with you, would you say that the transportation
14 electrification is key to being able to drive up the
15 rate of investment in efficiency in buildings and
16 whatnot, just off of the available revenue stream?

17 MR. JACOT: No, we're fine in funding, you know,
18 in terms of building electrification. The revenue bumps
19 we anticipate and need from transportation
20 electrification are going to be primarily invested in
21 achieving the SB 100 targets by 2035. So, the utility
22 scale investments we have to make, there will be -- you
23 know, there will be funding support for distributed
24 energy resources as well. But of that \$50 to \$80
25 billion estimate for what it's going to take to get to a

1 100 percent decarbonized grid by 2035, the vast majority
2 of that is going to be for infrastructure investment.

3 MR. RIDER: Great. We've got a little bit more
4 time, so I'm going to give you each an opportunity to
5 take another bite of the apple here and then we'll move
6 on to the Commissioner comments and questions.

7 So, you know, just each of you highlight one
8 additional key aspect of energy efficiency or, perhaps,
9 how it connects to decarbonization. And we'll go in the
10 order that we did the presentations, so start with you,
11 Steve.

12 MR. NADEL: Okay. I'm going to say if -- well,
13 you can go to my last slide on federal opportunities. I
14 think that is worth showing. And while you are pulling
15 that up, I will note building performance standards are
16 also very important. I know L.A. and San Francisco are
17 working on them, and quite a few jurisdictions. So, I'd
18 encourage California to think about that statewide.

19 But do you have that slide? So, this is our
20 best estimate of what's in play for reconciliation and
21 these are things that should very much help California
22 with their building decarbonization efforts.

23 More money for the Weatherization Assistance
24 Program, exactly how much is unclear. But Pierre
25 mentioned that.

1 There's very likely to be a new Hope for Homes
2 Residential Retrofit Program, incentives for retrofits
3 to help complement Retrofit California. There's going
4 to be very likely incentives for heat pumps and other
5 electrification measures. Probably some money for
6 affordable multifamily retrofits. And then various tax
7 incentives will be updated, typically adding higher
8 tiers and more money.

9 So, it's all very unclear. As we speak, the
10 House is voting on the budget. But over the next month
11 to two months, the details will become clear. But we
12 are talking on the order of \$100 billion across all
13 these items, plus or minus a few 10 billion, we'll say.

14 MR. RIDER: Thank you, Steve. About one minute
15 each and we'll continue on with Pierre. You're muted,
16 Pierre.

17 MR. DELFORGE: All right, with that I want to
18 second Steve's point that we need to be ready and smart
19 about the infrastructure money that is, hopefully,
20 coming down the pike soon. And how do we spend this
21 smartly to help our decarbonization objectives?

22 So, you know, we have a good idea with the AB
23 3232 Report on what are the key challenges and what are
24 the key sectors where it needs to be spent. And, you
25 know, as I outlined early on, I think we have market

1 transformation opportunities. We have, you know,
2 retrofit opportunities.

3 I want to highlight the LIWP, or Low-Income
4 Weatherization Program, again, which is I think a very
5 good example. And David mentioned the L.A. version of
6 that, which is a Cap and Trade funded program, which is
7 GHG focused. So, greenhouse gas emissions focused. And
8 has had very good results at retrofitting affordable
9 housing in a way that reduces emissions and occupancy
10 build very significantly because it's complete
11 flexibility in how that funding is allocated between
12 energy efficiency, electrification, and onsite
13 generation. And that's a good formula which I think we
14 should look at in terms of our scaling affordable
15 housing retrofits.

16 MR. RIDER: Great. Geof, your turn.

17 MR. SYPHERS: Two things quickly. One is
18 domestic hot water in a heat pump form is turning out to
19 be one of the most flexible dispatchable loads that
20 we've ever found. Twenty-four hours a day it's either
21 running or not. And statistically across just a few
22 thousand, we have a resource with a high degree of
23 confidence of being able to ramp it up or down. So,
24 that up or down is so much more valuable than just
25 ramping down. And so, that's one lesson.

1 The other is we're definitely wanting to find
2 that secret sauce about avoided costs for gas line
3 repairs. We've got a number of cities really trying to
4 figure out how to trim the gas line system by fully
5 electrifying neighborhoods or blocks. And we're finding
6 the partners that are most engaged with us, in addition
7 to the city staff, are long-time housing owner-
8 developers. They have a history of product that is
9 already either all electric or it is in need of
10 upgrades. And they are wonderful to work with.

11 And so, where I thought we'd have the most
12 challenge, we're actually having the most progress in
13 terms of partnering with low-income housing developers
14 to say how can we go after joint funding, do whole
15 blocks or whole projects together.

16 And I'm really encouraged because I think all of
17 us have put our finger on the structural problem that
18 can happen by accident, which is all the rich people do
19 these retrofits, and then all the stranded costs of the
20 gas system get borne by the poorest people in
21 California. And that could still happen if we don't do
22 this right.

23 And so, I'd encourage others to maybe start
24 reaching out to those long-time developers and then
25 tackle the rental market next, which is a harder market.

1 The one-off rental market in the private sector is going
2 to be much more challenging, but we're finding at least
3 a foothold there.

4 MR. RIDER: Excellent. Thanks, Geof.

5 And now from you, David.

6 MR. JACOT: Thank you, Ken. Just a couple of
7 points I wanted to make on the equity front. One is --
8 and I don't want people to take away from this that DWP
9 is in this massive load building stage. Yes, we are
10 from the electrification standpoint and those increased
11 revenues. But we're very conscious of what the bottom
12 line energy burden impact is to the customer.

13 We know that gasoline, when you convert from a
14 gasoline car to an electric car, the equivalent cost per
15 gallon is about a dollar fifty to two dollars, as
16 opposed to the four dollars plus we see. So, we know
17 that's a winner for customers. It's a winner for us and
18 it's a winner for customers.

19 It gets a little trickier with building
20 electrification. That's why we're building the onsite
21 solar into the CAMR program I mentioned.

22 The other piece, and which is hugely important,
23 especially to us, as a major department in the City of
24 Los Angeles, is the job creation aspect of these
25 programs, skilled job creation.

1 Our version of LIWP is going to include what I
2 kind of think is a fairly revolutionary requirement. A
3 customer, in order to receive the rebate must hire a
4 contractor who pays prevailing wage, and complies with
5 skilled and trained workforce requirements if the
6 project is large enough.

7 And we have very generously upgraded our
8 incentives based on initial estimates of what kind of
9 cost adder that's going to have.

10 We really want to promote not just job creation
11 through energy efficiency, but skilled job creation,
12 good jobs, long-lasting jobs. So, we want to grow that
13 ecosystem at the same time that we're making major
14 inroads into affordable housing, deep energy efficiency,
15 and electrification.

16 MR. RIDER: Thank you, David. Well, thanks, and
17 thank you for our all our panelists for the great
18 discussion.

19 We now turn to Commissioner McAllister and the
20 dais for questions and comments, after which we'll take
21 Q&A from Zoom.

22 COMMISSIONER MCALLISTER: Great. Thanks a lot,
23 Ken, great job. And really want to -- we could spend
24 all day with just with you four, with you five, and you
25 four panelists, you particularly. And I just want to

1 thank you all again for your thought leadership and for
2 being here today.

3 So, I want to recognize, first of all, that
4 Commissioner Rechtschaffen has joined us. Commissioner
5 Gunda did have to drop.

6 But really, I think the presence of two, you
7 know, of the primary PUC Commissioners on this set of
8 issues. It's just a testament to the fact, one how
9 important it is, two I think how closely the commissions
10 are collaborating on these issues.

11 And clearly, you know, many of the points you
12 brought up, some of them are kind of more with the PUC
13 and others more with the Energy Commission, and I think
14 it's a great opportunity for us to sort of, you know,
15 get and remain on the same page, and sort of strategize
16 together to leverage our respective authorities. And
17 so, I think that's really, really promising.

18 So, there's so many synergies here and I think
19 particularly I want to -- just a couple of comments
20 about those common themes here.

21 You know, number one the importance of low
22 income. Everybody so far as brought that up. I think
23 we have to -- it's absolutely true that the 40 percent
24 or so we have to focus on early, and primarily, and in a
25 sustained way. And it's really great to hear, you know,

1 Geof, Pierre, Steve, and David, all four of you
2 mentioned that, that you're having some success there.

3 And one takeaway already I think we can say is
4 that the LIWP program, as an example of true
5 integration, is something that we need to look for ways
6 to fund more deeply and more robustly, and replicate.
7 So, it's great to see those successes, really, in the
8 low income.

9 Also, the various aspects of electrification.
10 Geof, you brought up sort of induction as a gateway, a
11 gateway drug to electrification, which is really great.
12 It sort of flips the conventional wisdom and I think
13 that shows that has a lot of promise. So, thanks for
14 sort of your point there, as well as the robustness of
15 load flexibility in water heating. Because I think
16 that's also a little bit counter intuitive, so we're
17 looking forward to digging into that.

18 So, I don't want to take up too much time
19 because I know that my other -- my fellow Commissioners
20 here are going to have some great questions.

21 I guess one question I had is that -- so, some
22 of you, most of you mentioned data of some form or
23 another. And I want to kind of invite, maybe
24 particularly Geof in terms of the data sort of interface
25 that's seen between you and the utility, in your

1 particular case.

2 But, you know, data as a tool to target programs
3 and funding in an intelligent way and figure out, you
4 know, that there's a longer term sort of how do we
5 leverage state funding in our own particular ecosystem
6 to get private capital to come to this sector. So,
7 that's a little bit of a secondary question.

8 But in terms of information, data that can help
9 us target our policies, I'm interested in understanding
10 anything we can do at the state to help kind of nurture
11 that discussion and solve any barriers that might exist.
12 So, that's number one.

13 And then my second question has to do with
14 automation. How critical do you think automation is for
15 really sort of checking all these boxes, particularly
16 efficiency and flexibility at the same time. So, number
17 one is data and number two is automation.

18 MR. SYPHERS: Thank you, Commissioner. I think
19 one piece of data that would be immensely valuable for
20 all IOUs to share with their participating CCAs in
21 territories would be information about which customers
22 have engaged in which utility programs, and purchased
23 devices or smart controls as part of a utility program.

24 We have, you know, several thousand resources
25 under our dispatch now that we've directly incentivized

1 ourselves. But the utilities have a number of resources
2 that have been incentivized that are not being
3 dispatched. And those are also our customers. So,
4 they're distribution customers of the IOU, but they're
5 power generation customers of ours.

6 And so, we have the ability to roll those
7 resources into our demand response program immediately
8 if we know which customer has them. And so, that's an
9 example of a data sharing that could immediately bring,
10 probably in our territory in the neighborhood of 5 to 10
11 thousand resources in instantly, into being dispatchable
12 for summer capacity, and other reasons.

13 And I think your question on automated dispatch
14 versus other kinds of flexibility, it's all of the
15 above, right. There are some resources that just lend
16 themselves to automated dispatch, like electric vehicle
17 charging, heat pump water heaters, smart thermostats.
18 Those all lend themselves to automated dispatch.

19 But lots of people don't want automated
20 dispatch. They'd rather have a behavioral program where
21 they're being asked a question on an app, or being
22 incentivized as with a text message.

23 And I think you reach two different segments by
24 having, by offering both. So, we do. We actually have
25 both sides of that. And I think -- I don't see any

1 reason not to because the cost of having both is --
2 there's no additional cost, really, other than building
3 out an app that does behavior components.

4 I think the phone call to a giant industrial
5 partner is still a way that the utilities run demand
6 response. I think that's getting pretty antiquated, but
7 I think it can work, but you better have a pretty big
8 customer to warrant the value of that phone call.

9 And so, I think we got to get past that, and we
10 can. The technology's out there to do that in a more
11 automated way and have customers elect, you know, when
12 they allow that kind of dispatch to happen.

13 COMMISSIONER MCALLISTER: Thanks very much. I'd
14 point out the load management standards in the appliance
15 -- the flexible demand appliance standards that we're
16 developing to help really enable that automation and
17 really top to bottom, you know, have that ecosystem
18 really fleshed out over the next couple of years, few
19 years.

20 Anybody else want to -- please, I would invite
21 everyone else to comment on these two issues.

22 MR. JACOT: This is David. Thanks Commissioner.
23 I would just offer up that we also see it as an all of
24 the above. You know, we're a vertically integrated
25 utility. We recognize that we have hot spots in the

1 distribution system, overloaded circuits, so we have our
2 own data on all the -- frankly, it's not electric. We
3 don't have any policy or structural issues to it, and in
4 a lot of cases we just don't have very good data on our
5 own system.

6 But where we do, we know our congested lines and
7 we're actively targeting specifically those congested
8 feeders on a pilot basis for distributed energy resource
9 program, anything that we think will help. We can take
10 a look at what the primary customer load is on those
11 circuits and target programs specifically.

12 One word of caution on that approach, you know,
13 economists would love to say, well, that's your highest
14 value so you should invest in those there in terms of
15 your rebate levels. The problem is those congested
16 circuits are usually the rich ones. And so, we get into
17 very -- quickly we get in an optical situation of where,
18 oh, you're going to pay the rich people twice as much to
19 do what they should already be doing, they're the ones
20 causing the problem. So, that's something, you know, we
21 have to be conscious of.

22 So, basically the way we do it is we don't
23 increase the incentives, per se, but we try and increase
24 the awareness in those particular areas to buy us some
25 capacity through DERs on those congested feeders.

1 MR. DELFORGE: Can I just add a comment on the
2 automation question? I think automation and seeing
3 demand flexibility as a default, like an opt-out more
4 than an opt-in is critical for scale. You know, when
5 you have opt-in you get, you know, 5, 10 percent
6 participation. And what we really need is, you know,
7 people have a smart heat pump water heater which is
8 going to save them money, that is installed to be, you
9 know, flexible and grid responsive. Then, they don't
10 have a reason to opt out. They can if they want, but
11 why would they because it saves them money, there's the
12 same hot water they need.

13 And if we want to achieve the grid flexibility
14 potential that we need, we need to be more of a, you
15 know, default opt-out system.

16 And I want to recognize all the work that the
17 CEC and CPUC are doing on scaling and enabling grid
18 flexibility, as Commissioner McAllister mentioned, on SB
19 49, the load management standards, the Joint Appendix 13
20 for the Building Code, and the Self Generation Incentive
21 Program which is now leveraging those standards and
22 specifications to the market, but we're really just at
23 the beginning, we are providing the specs and
24 infrastructure. We need to continue to provide the
25 funding that is going to help this market transform.

1 But we do think that's got a major role to play in, you
2 know, helping decarbonize buildings.

3 COMMISSIONER MCALLISTER: Anyone else? Steve,
4 did you want to comment on either of these issues before
5 we go to other Commissioners?

6 MR. NADEL: No.

7 COMMISSIONER MCALLISTER: Okay.

8 MR. NADEL: I'll let the other Commissioners
9 comment.

10 COMMISSIONER MCALLISTER: Well, thanks. And I
11 wanted to thank you, Steve, for all of your work on the
12 infrastructure front and, you know, the two primary
13 bills, the infrastructure bill and the reconciliation
14 topics, and just that's a -- I've been somewhat engaged
15 on that through NASEO, as you know, and really there's
16 nothing like being in the trenches like you are. So,
17 thanks for all your advocacy there. I think it's going
18 to make a huge difference for California and all the
19 other states. So, thank you.

20 MR. NADEL: Make hay while the sun shines.

21 COMMISSIONER MCALLISTER: Yeah, fingers crossed.

22 All right, so other of my colleagues, I'll
23 invite any of you, all of you to ask your questions,
24 which I'm sure you have.

25 COMMISSIONER MONAHAN: I have a question, but I

1 want to make sure, Commissioner Houck if you have a
2 question, you can go before me.

3 CPUC COMMISSIONER HOUCK: No, go ahead.

4 COMMISSIONER MONAHAN: Well, I wonder could you
5 -- could somebody show Steve's slide on the allocation
6 of efficiency savings? It's that pie chart. I just
7 wanted to comment for a minute on the fact that
8 efficiency, the definition of efficiency has changed a
9 lot over time. And I know Steve is really close to
10 this, I'm sure others on this panel are as well.

11 But I was really struck by how, you know, half
12 of the allocation is transportation and it's efficiency
13 in the old definition, I would say of efficiency, not
14 the new definition of efficiency which is that EVs are
15 much more efficient than ICE engines, just on an energy
16 basis.

17 And we've seen the definition of efficiency
18 change on the building side, right? Where building
19 electrification and fuel switching is now part of an
20 efficiency solution. And just a comment about how I
21 think it's perhaps time to think about that on the
22 transportation side.

23 Because a lot of the efficiency savings, when we
24 think about a move to zero, we're talking
25 electrification of almost everything. And kind of I

1 don't want to say wasting money on ICE engines, you
2 know, on improvements to engines, but a lot of the --
3 you know, if you spend a lot of time and money on just
4 efficiency, you don't get to zero and you waste money on
5 solutions where you need to maybe focus more on the zero
6 carbon or, you know, electric vehicle, zero emission
7 vehicle investments.

8 So, just maybe a comment about how we really
9 have seen a shift on the building side, it's probably
10 time to think about that same migration on the
11 transportation electrification side.

12 And one more question for the panel, and I guess
13 we can get rid of this allocation of efficiency
14 standard. So, what we've seen in California is really
15 that solar pays for decarbonization strategies on the
16 building side. We're seeing a lot of -- and
17 Commissioner Houck is very close to this but, you know,
18 sensitivity on our rates and especially for low-income
19 families. And if you just electrify without adding
20 solar, at least that's what the analysis indicates in
21 California, you're going to be paying more money, or you
22 could potentially be paying more money for that lower
23 carbon, more efficient solution.

24 And I wonder if you could, if panelists could
25 just comment on that and whether you see some out for

1 California besides this marrying of solar plus building
2 decarb.

3 MR. JACOT: I'd be happy to comment on that.
4 Yeah, we see the same thing and that's why, you know,
5 we're building solar into the Building Electrification
6 Program, along with the energy efficiency.

7 But one thing that I think we're going to have
8 to start focusing on more and more in this state is
9 getting distributed storage out to every application
10 that already has distributed solar. You know, the
11 economics are working for the customers now because
12 we're still on some residual net metering capacity.
13 And, you know, we do have the over supply issue. We
14 need to be storing it. We need utility scale storage,
15 but we also need our customers to have onsite storage.

16 That will increase their costs because that's
17 more infrastructure, but that's really where it's going
18 to bring value to the utility. And because it brings
19 value to us, obviously we'll cover a good portion of
20 that through rebates, we'll be able to internalize that
21 and support, you know, a good chunk of that cost.

22 But absolutely that's going to be a big part of
23 this, making this work.

24 MR. SYPHERS: Can I add to that, that this
25 really depends on location and it also depends on the

1 existing conditions of our region. So, for example,
2 Sonoma County, one of the counties we serve, almost 35
3 percent of our peak is met by customer generation of
4 solar. And what that means is marginal solar, we have
5 to handle it at the distribution level and not send it
6 up to the transmission level. And that's difficult in
7 spring. That's actually quite challenging in spring.
8 And what that does, if we don't handle it locally, is it
9 actually creates a cost on all customers because the
10 wholesale value of that net-metered flow is often
11 negative, or it's certainly negative relative to fixed
12 price contracts that we have for wholesale power.

13 And so, it's really driving us to kind of work
14 with customers on sizing solar to meet their needs
15 alone, and really deemphasizing netting. And this is a
16 meta issue because it's not just the customer side, this
17 is whole utility scale issues. So, we've built a
18 portfolio where we're attempting and have for seven
19 years, achieved the ability to not net into the
20 wholesale market almost ever. So, we have a portfolio
21 that tries to not produce more energy in real time than
22 our customers are consuming, even though that's allowed
23 by all the regulation.

24 And so, there is this kind of issue of kind of
25 right-sizing solar. And, obviously, in hot markets,

1 when you're dealing with air conditioning the first
2 thing we say is like focus on the efficiency, like get a
3 mini split to replace that old air conditioner, and then
4 size your solar to meet it.

5 And so, solar is like this incredibly important
6 tool, but it needs to be applied surgically so that
7 we're not like adding cost to the system unnecessarily.

8 And so, local storage is going to matter, and
9 tons of cooling efficiency is going to matter I think
10 even more so than the marginal solar.

11 MR. NADEL: I just want to add a couple of
12 comments here.

13 MR. RIDER: Go ahead, Steve.

14 MR. NADEL: Yes. Regarding solar, solar makes a
15 lot of sense particularly for those homes and buildings
16 that have solar access, not everybody does. Nationwide,
17 NREL has estimated maybe half the buildings have solar
18 access, half do not. I'm guessing it's a bit higher in
19 California, but recognize it's not a simple solution.

20 And then, to go back to your comment about
21 transportation efficiency, Commissioner Monahan, our
22 analysis does include electrification wherever it's more
23 efficient. Electrification which is, you know, 95
24 percent plus, we have concluded. So, a lot of those
25 transportation savings are actually from EVs, but we

1 also look to having an as efficient an ICE vehicle as
2 possible, until we convert everything to EVs.

3 COMMISSIONER MONAHAN: Well, that's exactly --

4 MR. NADEL: One, you get the savings in the near
5 term --

6 COMMISSIONER MONAHAN: You might want to break
7 it out so you could tell, just like you do with
8 buildings, you know, what's the EV piece, what's the
9 efficiency piece.

10 MR. NADEL: Yeah, we probably could. There are
11 underlying assumptions there, yes.

12 MR. DELFORGE: If I can comment on the energy
13 cost of electrification and the use of solar, first I
14 think the question of energy cost is nuanced. It really
15 depends on the local rates and which rates are used. If
16 you take a default rate, it might not be cost effective
17 or, you know, depending on the situation. But if you
18 take an electrification rate, like Edison has an
19 electrification rate, PG&E's designing one, those can be
20 cost effective.

21 And particularly, also installing efficient heat
22 pumps, not just the minimum efficiency but, you know,
23 efficient space conditioning heat pumps or heat pump
24 water heater changes the economics. So, it's not just
25 about the storage, it's definitely one way of making it

1 cost effective, but choosing efficient equipment,
2 packaging it with energy efficiency in the home, rate
3 design or rate reform is going to be critical to make
4 electrification affordable at scale.

5 So, I think we have a lot of different tools in
6 the toolkit to make electrification affordable, both
7 from a, you know, first cost and from an operating cost
8 perspective.

9 MR. RIDER: If I could just build on what Pierre
10 just said, you know, the CPUC's avoided cost calculator
11 gives an idea of what the marginal cost of electricity
12 is. And I think it was something around 12 -- they keep
13 -- there's a few versions of it, but one I saw was
14 around 12 cents per kilowatt hour, which is certainly a
15 lot less than what current rates are. So, you know,
16 there are ways, you know, if electrification customers
17 can see some rates that are closer to that marginal cost
18 you could see, you know, an improvement in the economics
19 for electrification.

20 MR. JACOT: Yeah, I would add in regards to my
21 earlier comments about, you know, how we anticipate
22 electrification revenues helping us manage the
23 transition by 2035.

24 Pierre's point's exactly raise why we're looking
25 to transportation to be more of the big ticket revenue

1 stream than building electrification because we don't
2 need to subsidize or do an electrification rate for
3 transportation. The economics already work for the end
4 user. In fact we could raise rates it will still work.

5 But on the building side, that's where of gets a
6 little trickier.

7 So, we are doing some preliminary analysis on
8 electrification rates. But just remember that kind of
9 swims crosswise against what we're trying to do from a
10 revenue standpoint to drive this transition.

11 COMMISSIONER MCALLISTER: So, I would just add
12 that, you know, the difference between the avoided cost
13 and the rate itself, really does vary widely across the
14 state. So, if you're talking DWP or SMUD, they're
15 closer. In the investor-owned utilities, they tend to
16 be quite a bit different. And so, that NEM incentive
17 really does depend on where you're located, which
18 service territory.

19 And I do want to pivot now and invite
20 Commissioners Houck and Rechtschaffen to ask questions,
21 just to make sure we have enough time to give them an
22 opportunity.

23 COMMISSIONER RECHTSCHAFFEN: Go ahead,
24 Commissioner Houck.

25 COMMISSIONER HOUCK: Oh, thank you, Commissioner

1 Rechtschaffen.

2 I appreciate the conversation. I know we only
3 have a couple of minutes left. I don't know if you want
4 to touch on how distribution grid planning relates to
5 some of the issues that we've talked about and what we
6 may need to be looking at in reenvisioning the
7 distribution side of the grid planning.

8 MR. SYPHERS: I think it's a giant question.
9 And so, obviously, some of the drivers of distribution
10 infrastructure aren't just, you know, building
11 electrification which when paired with really deep
12 efficiency can have a medium-sized impact. But it takes
13 us back to transportation because that's an entirely new
14 load and it's a really major load.

15 And what we're seeing is with trucks, busses,
16 delivery vans, those kind of uses, the rate of charging
17 is high enough that the local impact can be pretty
18 significant. So, if you're looking at fleet areas, or
19 municipal bus fleets, or school districts, you may be
20 seeing localized increases in load that are in the
21 megawatt to 10 megawatt scale for charging.

22 And so, timing that becomes incredibly
23 important. And so, from an infrastructure standpoint it
24 may still require reconductoring, or new transformers,
25 and it probably will in many cases.

1 But I think -- I think what I would say as a
2 general answer, to be quick, is keep your eye on
3 transportation as the major driver for distribution grid
4 changes, and buildings as a medium to small driver. I
5 think that would be my takeaway.

6 MR. JACOT: Yeah, just to put it in perspective
7 and I'll leave it at this. But we generally retail
8 about 24,000 gigawatt hours a year. We estimate
9 transportation's going to take that up, it's going to
10 double that up to about 48 to 50, and then buildings
11 another 50 percent of our current load on top of that,
12 another 12 on top of that. So, we're looking at about
13 60 to 62 thousand gigawatt hours a year retail versus
14 the -- under a full electrification of buildings and
15 transportation scenario versus the 24,000 we retail now.

16 Now, granted we need as much energy efficiency
17 as possible to bring that number down, but it does kind
18 of put into perspective, some pretty sobering numbers.
19 We're looking at, you know, your average truck stop
20 electrified into a charging station, high speed
21 charging, a 20 megawatt point load. Just massive,
22 massive challenges.

23 MR. SYPHERS: And I would just add I agree that
24 as I understand the data in California, because the
25 peaks are generally summer, building electrification

1 will have less of an impact on peak. But a local area,
2 places like Tahoe and Squaw Valley, you probably will
3 get winter peaks and electrification can have a real big
4 impact there. So, something for PG&E and Edison to pay
5 attention to.

6 COMMISSIONER MCALLISTER: Great. Commissioner
7 Houck, did you have any follow-up questions before I
8 move to Commissioner Rechtschaffen?

9 CPUC COMMISSIONER HOUCK: No, no, you can go
10 ahead.

11 COMMISSIONER MCALLISTER: Okay. Great. Well,
12 thanks so much, really appreciate that.

13 Commissioner Rechtschaffen, would you like to
14 ask any questions?

15 CPUC COMMISSIONER RECHTSCHAFFEN: I have one
16 question of Geof. Unfortunately, I lost service for
17 part of your presentation. I'm wondering if you have
18 any one or two lessons for the PUC from your Zero
19 Interest On-Bill Financing pilot that you started. Does
20 that require a showing of bill neutrality, or what --
21 anything else, any concrete advice you can give us as we
22 consider low-cost financing options for electrification?

23 MR. SYPHERS: Well, one takeaway is the -- this
24 isn't an easy problem to solve. But the bill
25 presentation, you know, what's written on a bill is so

1 intensely regulated that actually explaining what the
2 charges are, you know, to the customer over time is a
3 challenge. Because when they take out the financing and
4 they sign their agreement, and so forth, but then those
5 charges show up on a bill.

6 And that sounds like this very administrative
7 thing that's easy to solve, but we've hit a brick wall
8 with that. It's really difficult to get the IOUs to
9 want to talk about how we're discussing those charges on
10 the bill.

11 So, we've made some progress and, of course, the
12 charges are on the bill and the money is being
13 collected, but it is -- that's one challenge.

14 Another lesson, though, is that the practice of
15 on-bill financing, just as we saw with PACE financing,
16 there's an analog there, really does force us to work
17 with a customer to ensure that they have overall
18 savings. And there was a public comment on this. Tom
19 Paine wrote into the chat.

20 If you do nothing and you essentially allow a
21 customer to pick and choose their retrofit, and then
22 finance it on the bill, there is a chance that their
23 energy bill goes up despite the fact that they're buying
24 some more energy-efficient equipment because they may
25 use it more often, for example.

1 If they only have heat today and they're adding
2 a heat pump, and now they have cooling in the summer and
3 they never had that before, we saw this in the Pacific
4 Northwest with the heat wave, suddenly there's air
5 conditioning in houses that have never had air
6 conditioning before. That can be an issue. And so, the
7 bills can go up.

8 So, what it's forcing is having that detailed
9 conversation with customers. And that's a good thing
10 because it means that we're talking about their overall
11 picture. You know, we're pulling up their energy use,
12 we're looking at their bills together, we're thinking
13 about the retrofit and we're walking them through it,
14 really hand-holding them.

15 And I think that is time consuming, but I think
16 it's an essential part of getting on-bill financing to
17 work in terms of being neutral at worst on your electric
18 bill. And really, we're aiming to be a net cost
19 savings, even with the financed project.

20 COMMISSIONER RECHTSCHAFFEN: Thank you.

21 COMMISSIONER MCALLISTER: Okay. Well, thank
22 you, both of you. We could go on all day with this
23 conversation and I have a ton of questions that I'm not
24 going to ask here.

25 And I'm going to take the opportunity to pivot

1 to the Zoom Q&A. And in particular, Jim, I want to,
2 one, say that in terms of program integration, focus on
3 low income, disadvantaged communities, and kind of
4 trying to do deep efficiency at the same time we promote
5 electrification. We do have an interesting input from
6 Bruce Ray later in the day, not to put him too much on
7 the spot. But the first panel of the afternoon, an
8 interesting kind of program model there as we talk about
9 different program approaches for doing, you know, a
10 program that they've been doing in South Coast that
11 could provide a platform for a further discussion on
12 that topic. So, I want to just note that.

13 And then, Jim Lutz asked the question and I just
14 wanted to invite that question to start off, about
15 community level engagement. This is one of the
16 questions I had for the panelists as well.

17 You know, the state is not a community present,
18 you know, organization as a rule. And CBOs, we've heard
19 this over and over again in our track on building
20 decarbonization in this IEPR cycle that there's got to
21 be sort of, you know, hands and feet on the ground, you
22 know, touch with consumers.

23 You know, Geof, you just mentioned something
24 along those lines and David, I think you did, too.

25 You know, what are -- I would just invite any

1 and all of you to comment on what potential kind of
2 program models to get resources on the ground to help
3 that customer interaction or that resident interaction,
4 particularly in disadvantaged communities. You know,
5 what sort of model? Now, the CCA would be one, but
6 there are others.

7 What approaches do you think will be most
8 effective to really get those resources on the ground at
9 the community level to help this transition take place?

10 MR. JACOT: I'm happy to start. We have a very
11 extensive network of community-based organizations that
12 we give grants to around various -- you know, the
13 promotion of conservation, you know, we're the water
14 utility as well. So, power and water conservation and
15 efficiency. That's a good way. We have about 25, I
16 want to say, of these grants citywide, both at the
17 council level, at the district level, as well as at the
18 overall city level.

19 That's a good grass roots army I kind of think
20 of it as. They have connections and networks that we
21 can only dream about, so we leverage them directly.
22 That's one way.

23 Another way is, as we look to launch the CAMR
24 Program in particular, the Comprehensive Affordable
25 Multifamily Retrofit, we will be conducting a lot of

1 outreach through a very established industry partner,
2 CHPC, California Housing Partnership Collaborative, I
3 think. And they have a lot of industry connections to
4 affordable housing owners, developers, and managers.

5 So, those are a couple things we're thinking
6 about. There are certainly lots of other valid ways to
7 address that.

8 COMMISSIONER MCALLISTER: Thanks very much.
9 Anybody else want to comment briefly on that before we
10 move to the next panel?

11 MR. SYPHERS: Just real briefly, I think
12 something I would add is we've reoriented some of our
13 staff to working with CBOs in a new way. And that is we
14 started to ask the question what do you need or what are
15 you working on?, instead of how can you help us. And it
16 changes the equation to being a partner. And some of
17 the answers we get, we try and find other governmental
18 entities who are partners of ours to help them with.

19
20 But sometimes that VENN diagram overlaps. So,
21 we heard in Rosalind, one of our DAC communities, that
22 there's a profound lack of access to broadband internet.
23 And one of the things we started to realize is, hey,
24 broadband, rights of way, CPUC regulation, PG&E's
25 involved. We happen to know a lot of these players.

1 So, let's start talking about this issue. And then,
2 that gets us into a conversation about everything else
3 because now we're helping them on something they need.

4 And I'd encourage other power providers to start
5 thinking that way. It's super time consuming, but it is
6 -- it's becoming a really effective tool.

7 COMMISSIONER MCALLISTER: Yeah, in other parts
8 of the country the co-ops actually do a lot of those
9 kinds of services as well, so that could be a model we
10 look to a little bit.

11 Did Pierre or Steve, did you want to comment
12 briefly on this before we move on?

13 MR. NADEL: I will add a brief comment. I
14 totally agree with David. If you're trying to reach
15 diverse communities, work with the community
16 organizations.

17 Another good avenue is work with some of the
18 churches in those areas. They tend to be a lot of the
19 leaders. I don't mean the mega churches, but often the
20 storefront churches, they tend to be very well
21 connected.

22 MR. DELFORGE: I'm going to let this stand, I
23 don't have anything to add. I think these are good
24 comments.

25 COMMISSIONER MCALLISTER: Okay, thanks a lot,

1 Pierre.

2 So, I think we've touched on the other two
3 questions that are in the chat. And in the interest of
4 time, maybe we can answer those in written form there,
5 in the chat itself, and move on to the next panel.

6 I want to thank you. Well, how about I pass it
7 back to Ken to just wrap us up and then move us on to
8 the next panel. Thank you all for being here, this was
9 fantastic.

10 MR. RIDER: Yeah, I'll just wrap up by saying
11 again, just seconding that thank you to everyone here on
12 the panel. And we'll move on to Heather I think, who
13 will transition us to panel 2. But thank you everyone,
14 again.

15 MS. RAITT: Great. Well, thank you again,
16 Steve, and Pierre, and Geof, and David. I think that
17 was a great discussion. And thank you, Ken, so much for
18 moderating that.

19 So, our next panel is on -- presentations on
20 Metrics for Transitioning Between Efficiency and
21 Emissions.

22 So, our first presenter is Jessica Allison. And
23 she is a Senior Energy Analyst at the CPUC. So, go
24 ahead, Jessica.

25 MS. ALLISON: Hello. Thank you for the

1 introduction. Can everyone hear me okay?

2 MS. RAITT: Yes, that's great.

3 MS. ALLISON: Great. All right, so as was said,
4 my name is Jessica Allison and I work for the California
5 Public Utilities Commission. I'm the Cost-Effectiveness
6 Lead in the Energy Efficiency Branch. And today I'm
7 going to be just discussing the metrics that we use to
8 assess the Energy Efficiency Portfolio, and then also
9 the structure of the portfolio and how that relates to
10 GHG emissions.

11 The next slide, please. So, just a quick
12 overview of the presentation. I'm going to start with a
13 discussion of portfolio segmentation, and that's just
14 describing how the portfolio is structured and what
15 strategies we use to assess the portfolio in those
16 different segments.

17 From there, I'll go onto a very high level
18 discussion of cost effectiveness and how GHGs fit into
19 that discussion.

20 And then, next, I'll discuss our goals metric
21 and how that metric is transitioning from an energy
22 savings metric to a new total system benefit metric.

23 And then finally, I'll close the conversation
24 with just a discussion about how to maximize total
25 system benefit and what some of the things that is

1 targeted by that new metric. Next slide.

2 So, to give an overview of the energy efficiency
3 portfolio, in the past we had a single portfolio that
4 was assessed cumulatively. So, all the different types
5 of programs were lumped together and they were assessed
6 using a combination of a goals metric, and then a cost
7 effectiveness metric.

8 But starting in 2024, we're going to be
9 transitioning to a new strategy that divides the
10 portfolio into three segments based on the primary
11 purpose of the programs in those segments.

12 So, the first segment is the primary resource
13 acquisition segment. So, these are programs that have a
14 primary purpose of, and a short-term ability to, deliver
15 cost-effective avoided cost benefits to the electricity
16 and natural gas systems.

17 So, what I mean by short-term is really the
18 lifecycle of the portfolio, which in this case is four
19 years. So, we're not talking about short-term savings
20 that only last a year, but the idea here is that these
21 savings will be measurable and potentially cost
22 effective in a four-year period.

23 The second segment is a market support segment
24 and these programs have a primary purpose of supporting
25 the long-term success of the energy efficiency market.

1 And there's a lot of different activities that
2 can fit into this bucket, including the training of
3 contractors, educating customers, building partnerships,
4 and then also moving technologies that are not currently
5 cost effective towards greater cost effectiveness.

6 And what that looks like depends on the nature
7 of the program. But this is an opportunity maybe to
8 focus on types of programs that are new, or that aren't
9 typically cost effective.

10 I mean an example that hits on the GHG
11 conversation might be a program that targets
12 refrigerants specifically, rather than just technologies
13 that are only cost effective, which is the focus of the
14 primary resource acquisition
15 segment.

16 And then the third, and very important segment,
17 is the equity segment. So, these are programs that have
18 a primary purpose of providing energy efficiency to
19 hard-to-reach or underserved customers in disadvantaged
20 communities in advancement of the Commission's
21 Environmental and Social Justice Action plan.

22 So, technologies which are cost effective to the
23 general population may be harder to deliver to different
24 populations, and this segment is an opportunity to reach
25 those customers that may be left out of both traditional

1 energy efficiency and then also ESA. And again, there's
2 -- again, there's a lot of different types of programs
3 that can fit into that bucket. Next slide, please.

4 Here, we have a kind of a unique strategy. We
5 have different assessment based on the type of program.
6 So, for the primary resource acquisition segment we're
7 going to continue to have a cost effectiveness ratio of
8 1-to-1. So, that would be a TRC of 1 for this segment.
9 And that structure is familiar to what we currently do
10 in the energy efficiency portfolio with our TRC targets.

11 But rather than having that TRC target include
12 all the programs that have different functions, we're
13 going to have a different strategy for the equity and
14 market support bucket. So, for those segments we're
15 going to have a budget cap of 30 percent, so it must not
16 exceed the 30 percent of the total budget. And then, we
17 will use achievement metrics to assess the success of
18 those programs, rather than focusing just on whether or
19 not they're cost effective.

20 And as we've done in the past, the portfolio
21 must collectively achieve its total system benefit
22 goals. So, we'll set a total system benefit goal that
23 will apply to the full portfolio, but within that
24 portfolio the segments will be assessed a little bit
25 differently based on the primary purpose of the program.

1 Next slide.

2 For the resource segment cost effectiveness,
3 we'll still be applying a cost effectiveness screen, as
4 I mentioned before.

5 And at the CPUC, the total resource cost test is
6 the -- still the primary test for determining cost
7 effectiveness of an energy efficiency measure.

8 And we wanted to show this slide just to discuss
9 what goes into cost effectiveness and also to understand
10 how that relates to GHGs, because those things are
11 connected.

12 So, for the benefits portion of the TRC ratio,
13 you see that it's all of the avoided costs combined, and
14 then you apply the net to gross ratio. And that net to
15 gross ratio determines or, I guess, represents how many
16 customers in that program might be free riders and how
17 many are actually moved to adopt these technologies by
18 the program itself.

19 And the costs of the TRC ratio include all of
20 the program administrator costs to run the program, plus
21 the incentives that are paid to the free riders, so
22 these are people who would have installed the
23 technologies anyway, and then plus the net participant
24 costs. So, that's the cost to the actual customer, in
25 either purchasing or installing the equipment minus

1 whatever incentives they received.

2 And you'll note here that incentives to the non-
3 free riders aren't including in either a benefit or a
4 cost because they actually canceled out. It's included
5 in both places, so that's considered neither a cost or a
6 benefit.

7 And in terms of what we consider as benefits in
8 the TRC ratio, those are all of the avoided costs
9 recognized by the Energy Efficiency Branch in the CPUC.
10 So, that includes the energy costs, transmission,
11 distribution, capacity, ancillary services, and then
12 GHGs, including our new refrigerant and high-GWP gas
13 avoided costs.

14 Plus, and this is specific to just the Energy
15 Efficiency Branch currently, the avoided gas
16 infrastructure costs for programs that are all-electric
17 new construction. So, those all-electric new
18 construction programs can include the avoided gas
19 infrastructure costs as a benefit, which is helpful for
20 encouraging, you know, lower GHG-emission residential
21 buildings.

22 And here, in the TRC, we include the GHG benefit
23 as an additional incentive to focus on the programs that
24 do reduce the greenhouse gas emissions. Next slide.

25 So, one of the reasons the TRC is the primary

1 test at the CPUC is because it includes the broadest
2 range of perspectives. So, that means that both the
3 costs and the benefits to the utility and to the
4 customers, who are installing the technologies, are
5 included in this equation, as mentioned before.

6 And here you see just a little table that has
7 the utility, and the customer, and costs, and benefits.
8 So, you'll see to the utility the primary benefits are
9 the avoided costs. So, those are the costs that
10 installing this technology allows them to basically not
11 pay in supporting our energy grid.

12 The costs from the utility perspective are the
13 customer incentives generally, including the incentives
14 that are paid to the free riders. And then, finally,
15 the costs to run the program itself. So, that's all of
16 the labor that goes into designing and managing the
17 program.

18 And then on the customer side you'll see that
19 our benefits are the customer incentives, so those are
20 the incentives paid to the customer, as well as their
21 costs, so the net participant costs. So, that's the
22 difference between the technology costs, and its
23 installation, and then whatever incentive they received.
24 Next slide.

25 So, a new thing at the CPUC Energy Efficiency is

1 our new Total System Benefit Metric. So that benefit,
2 rather than focusing on just kilowatts, kilowatt hours,
3 and therms, we're going to be actually setting our goals
4 in a dollar value. So, that will be, in dollars, the
5 lifecycle avoided costs of the energy efficiency
6 activities on an annual basis.

7 And this metric will be outputted from the
8 Potential and Goals Study, which my colleague, Coby,
9 will be discussing in just a moment. Next slide.

10 So, in order to maximize total system benefit,
11 you see that we're encouraged to pursue savings that
12 deliver high avoided costs to the grid and that can
13 include programs that have a high GHG benefit.

14 And typically, the higher kilowatt measures
15 deliver higher benefits, but that's not always the case.
16 In this table you see that the agricultural clean water
17 pump actually delivers the highest savings in terms of
18 kilowatt hours, but its benefit per kilowatt hour is the
19 lowest. And then you see that the fan controller has
20 the lowest kilowatt hour, but then the highest benefit.

21 So, this suggests that this fan controller
22 measure probably has high avoided cost values in either
23 capacity, or GHG, or other avoided costs that make it
24 particularly beneficial.

25 The next slide. And if you're interested in

1 getting more information on total system benefit, our
2 Total System Benefit Guidance document is available for
3 public comment and review on our public documents area
4 through August 26th. And we intend to update the
5 guidance document after the release of the Potential and
6 Goals Decision, which Coby will discuss. And then,
7 we'll update the document and really release it to the
8 service list.

9 Thank you, I appreciate your time.

10 MS. RAITT: Great. Thank you so much, Jessica.

11 So, Coby Rudolph is next and he is the Senior
12 Regulatory Analyst also at the CPUC. Thank you. Go
13 ahead, Coby.

14 MR. RUDOLPH: Thanks Heather. Can you hear me
15 okay? Audio check?

16 MS. RAITT: Yes, go ahead.

17 MR. RUDOLPH: Okay, great. You can go to the
18 next slide. So, I'm going to talk through our CPUC 2021
19 Energy Efficiency Potential and Goals work. And here
20 are just a couple items that we'll look at.

21 What's the Potential and Goals process? How
22 does the goalsetting work happen? We'll look at key
23 updates to the work that we've done this cycle. And
24 then, get into the goals themselves and how they look in
25 our new goals metric total system benefit. You can go

1 to the next slide.

2 So, how do we get CPUC to adopt energy
3 efficiency goals? Well, every couple of years we
4 conduct an Energy Efficiency Potential and Goals Study.
5 And it forecasts a number of scenarios of cost
6 effective, achievable savings.

7 So, you look at the kind of flow chart on the
8 bottom here, what you see is that state policy requires
9 us to pursue all cost effective, achievable energy
10 efficiency. And that's where our Potential and Goals
11 Study comes in to forecast what that cost effective
12 achievable savings is.

13 Now, currently, we then take the forecast for
14 each scenario and produce a number of different outputs,
15 and our current goals are expressed in first year
16 savings, kilowatt hours, kilowatts, and therms.

17 And then, those goals -- those goals, those
18 study outputs then become requirements for IOUs and
19 program administrators to achieve in their energy
20 efficiency portfolios.

21 Starting in 2024, we are -- as Jessica
22 mentioned, we're shifting that goals metric from first
23 year savings to total system benefit, TSB, expressed in
24 dollars. So, the Potential and Goals Study outputs both
25 kinds of metrics, the first year savings and the total

1 system benefit.

2 And starting in 2024, it's that total system
3 benefit that the utilities will then be taking and using
4 as their requirement for what they need to achieve in
5 their energy efficiency portfolios. You can move to the
6 next slide.

7 We conduct the Energy Efficiency Potential and
8 Goals Study in a couple of different phases. We start
9 with analysis of technical potential. What's the entire
10 amount of savings available each year if we were to
11 upgrade every building in the state to its highest
12 technical level of efficiency?

13 Then we apply an -- what we call an economic
14 screen to each measure in our study. Where we basically
15 run it against our cost effectiveness tests at various
16 thresholds and to see what comes out as cost effective
17 according to our cost effectiveness test policy.

18 Then for those measures in a given scenario that
19 do pass a cost effectiveness screen, we take them
20 forward and model their customer adoption. How much do
21 we expect could actually be achievable through energy
22 efficiency portfolios? And that's our achievable
23 potential. Next slide.

24 Some of the things that we've worked hard on
25 this study to improve our work, one is fuel substitution

1 forecasting. As many of you know, a fuel substitution
2 decision that came out a couple of years ago that now
3 allows a number -- more fuel substitution measures to be
4 implemented in our energy efficiency portfolios. And
5 so, we needed to work to incorporate those fuel
6 substitution measures into our forecasting.

7 We conducted some sensitivities for COVID
8 impacts, and also the impact of combining energy
9 efficiency and demand response measures together, both
10 on cost effectiveness and on customer adoption.

11 We ran an alternative scenario analysis where
12 instead of using cost effectiveness, we assessed how
13 energy efficiency measures, what performance they were,
14 if they were competed against other kinds of resources
15 in our IRP directly.

16 We conducted a few market studies to look at
17 different factors for customer adoption, things other
18 than just economic attractiveness. So, other than just
19 dollars and cents, and how they impact the way that
20 customers think about whether they're going to buy or
21 adopt an energy efficiency measure.

22 And then, did a deeper dive into some
23 industrial/ag subsectors to get a better understanding
24 of what's there in terms of energy efficiency potential.

25 We worked on our Total System Benefit output

1 metric, especially as we head into 2024 when it will be
2 the compliance metric for our energy efficiency
3 portfolios. And we did the analysis using two different
4 versions of the CPUC Avoided Cost Calculator, the 2020
5 vintage and the most recently adopted 2021 Avoided Cost
6 Calculator. Next slide.

7 On that avoided cost piece, the Potential and
8 Goals Study uses our Avoided Cost Calculator to
9 calculate that cost effectiveness and total system
10 benefit. It's the benefit side of our cost
11 effectiveness calculation, as Jessica mentioned.

12 And a spring decision instructed our IOUs to
13 keep using the 2020 adopted avoided costs for the next
14 couple of years, 2022 and 2023.

15 Meanwhile, we published our Potential and Goals
16 Study in the spring, using those 2020 adopted avoided
17 cost values. And then, our 2021 avoided cost was
18 adopted a little later in the spring, and actually maybe
19 even the early summer.

20 So, what we have here are both vintages of
21 avoided costs. And our proposed goals, as outlined in a
22 proposed decision issued last Friday, actually used both
23 versions of the Avoided Cost Calculator. They based the
24 2022 and 2023 goals on 2020 adopted avoided costs. And
25 then, goals for 2024 and beyond, through 2032 are based

1 on the 2021 Avoided Cost Calculator values. Next slide.

2 So, here's what we see using our 2020 Avoided
3 Cost Calculator. You can see that the -- I know it's a
4 little small on the screen. We go from gigawatt hours,
5 first year gigawatt hour savings on the left to first
6 year therm savings in the middle, and then total system
7 benefit in dollars, in millions of dollars on the right-
8 hand side. The dotted line is the goal that we set in
9 the previous version of our Potential Study 2019. So,
10 you can see how they compare.

11 Now, on the left side what we see is a reduction
12 in energy efficiency, in particular energy efficiency
13 equipment savings, versus our last study. And then
14 also, the impact of fuel substitution, that increased
15 electric supply which brings the net gigawatt hour
16 savings down. So, both of those are reflected in that
17 left-hand graph.

18 On the other hand, the middle chart of gas
19 savings is where you see the impact of fuel substitution
20 coming in, that gas savings from fuel substitution
21 pushing the numbers up.

22 And then, total system benefit reflects both the
23 electric and gas systems. And so, you can see kind of
24 how that -- what that looks like in dollar form over
25 time. Next slide.

1 The same structure here with our 2021 avoided
2 cost-based results. With our 2021 avoided costs, you do
3 see lower electric equipment savings because the
4 electric avoided costs decline in our 2021 vintage. And
5 then also, a bit lower gas savings from energy
6 efficiency equipment, but then slightly larger impacts
7 from fuel substitutions because more fuel substitution
8 measures become cost effective in the 2021 avoided
9 costs.

10 The next slide. Here we dive a little bit more
11 deeply into fuel substitution in particular. And you
12 can see where the fuel substitution savings is coming
13 from. It's mostly in residential and mostly in water
14 heating. What we find is that more water heating
15 savings passes our cost effectiveness screens than space
16 conditioning. Next slide.

17 And I know there are a lot of numbers on here,
18 but this is just kind of to give you a sense of how
19 we're transitioning from those first year savings goals
20 into our total system benefit goals that Jessica walked
21 through, the ones that include the avoided costs from
22 energy savings, demand, and then also greenhouse gas
23 compliance costs.

24 And you can see that the goals for 2022 are
25 based on the single fuel savings, so gigawatt hours,

1 megawatts, and therms. And then, when we move into
2 total system benefit, they're reflected in dollar form
3 and broken out by savings type as well. Next slide.

4 So, our proposed decision to adopt new energy
5 efficiency goals was issued last Friday. Comments are
6 due in early September, mid-September, and then reply
7 comments shortly after that. We do expect that the
8 Commission will vote on a final decision to adopt goals
9 a bit after that, possibly at the Commission's September
10 23rd voting meeting.

11 And I believe that's my last slide. And thank
12 you so much, look forward to the Q&A.

13 MS. RAITT: Great. Thank you, Coby.

14 So, next we have Ingrid Neumann, who is the
15 Efficiency Lead Specialist at the -- in the Energy
16 Assessments Division of the Energy Commission. So, go
17 ahead, Ingrid.

18 MS. NEUMANN: Thank you for the kind
19 introduction. Hello Commissioners and stakeholders.
20 I'm here today to present on some considerations as we
21 plan on refreshing our SB 350 tracking and projections
22 for the 2021 IEPR. Next slide, please.

23 SB 350 establishes an aspirational goal for the
24 state to double statewide energy efficiency savings in
25 electricity and natural gas end uses by January 1st,

1 2030.

2 This may include fuel substitution or building
3 electrification if net GHG reductions are realized. Of
4 course, all efforts must be cost effective and not
5 adversely impact public health and safety.

6 The next slide, please. So, here is a diagram
7 of our high-level analytical process flow. We combine
8 and calculate the cumulate energy savings from each of
9 the data streams on the left-hand side. The asterisks,
10 or the starred ones, are coming from the CPUC's
11 Potential and Goals Study, which Coby just presented to
12 us.

13 We include historical and projected IOU and POU
14 program savings, as well as codes and standards, and
15 other beyond-utility incentive programs.

16 We report out gas savings in mm therms and
17 electricity savings in gigawatt hours, as well as their
18 combined energy saved in quad Btus. Lastly, we also
19 quantify GHG emissions saved. Next slide, please.

20 This is a diagram from our first report in 2017,
21 where we set the SB 350 doubling goals and made the
22 first set of projections. The black solid line is
23 marked in very small script. The SB 350 doubling goal
24 and then the colorful wedges of the buildup, all the
25 different contributions towards meeting that goal, as

1 was anticipated at that time.

2 As programs evolve and as evaluation and
3 measurement data comes in, we update those projections
4 every two years. Next slide, please.

5 So, the first goals did not -- or the first
6 projections did not meet the doubling goal. And various
7 recommendations were made in the report to explore
8 additional savings. All of those recommendations were
9 included in our 2019 analysis, published online as part
10 of our California Energy Efficiency Action Plan. Next
11 slide, please.

12 As part of the process in 2019, we created and
13 built the EE Data Aggregation Tool to support SB 350
14 tracking and projection efforts. This allowed us to do
15 the work in-house, where we would collect the savings
16 and report the energy savings and GHG reductions. We
17 can do this by utility service area, sector, and end
18 use.

19 We also separately quantify disadvantaged
20 community and low-income impacts. Next slide, please.

21 This shows the results from 2019 in two
22 scenarios. The reference scenario or business as usual
23 type scenario, doesn't meet the SB 350 goals. You'll
24 see that it falls short.

25 Many programs were only funded for a few years,

1 so we couldn't project those out further, as we had
2 maybe done so in 2017.

3 Then, the program -- if the program wasn't
4 funded anymore, these savings would decay over time
5 because we're looking at cumulative savings here.

6 In the aggressive scenario, we took a very
7 optimistic, achievable potential view of what the
8 savings could look like if those enhanced code
9 compliance rates were realized, additional codes and
10 standards measures came to fruition, as well as
11 increased funding in our participation penetrations for
12 financing and incentive programs. We also added
13 potential new programs needed to meet those goals.

14 Of course, as we move forward EM&V would be
15 required to confirm that those savings are actually
16 occurring. Next slide, please.

17 For the 2021 IEPR cycle, we are working on
18 enhancing our technical capabilities for energy
19 efficiency tracking and projections. We've been
20 incorporating new data from all sources, as well as
21 incorporating new saving sources as programs come
22 online, and updating our current sources.

23 We have considered overlap in customer segments
24 that are being targeted by different, but similar,
25 programs. And we have considered market-based

1 activities that may result in energy efficiency savings
2 that aren't already being captured elsewhere. Next
3 slide, please.

4 Of course, SB 350 exists in the broader policy
5 context of building decarbonization and other policy
6 goals, such as SB 100 and AB 3232.

7 As part of our work to support AB 322 analysis,
8 recently published in the California Buildings
9 Decarbonization Assessment, we developed the Fuel
10 Substitution Scenario Analysis Tool, known as FSSAT.
11 Next slide.

12 For the 2021 IEPR, we have been expanding on our
13 technical capabilities for electrification scenarios
14 from the more "what if" analysis that existed in the
15 apps that were used in support of AB 3232, to
16 projections based on current and future program
17 activity.

18 We have also been incorporating electrification
19 resulting from local ordinances, as well as the recently
20 adopted 2022 Title 24 Updates encouraging building
21 electrification. Next slide, please.

22 The AB 3232 analysis was informational and
23 explored the potential for the state to reduce emissions
24 of greenhouse gases in the state's residential and
25 commercial building stock by at least 40 percent below

1 1990 levels, also by January 1st, 2030. That was
2 explored using one or more scenarios within numerous
3 possible decarbonization strategies.

4 For the electrification scenarios, next slide
5 please, we quantified the net GHG reductions by
6 including gas combustion which, of course, would be
7 reduced when electric appliances replace gas appliances.

8 Since, however, electric appliances do add an
9 incremental amount of electricity, the emissions from
10 the generation of said electricity are included, as are
11 the HFC leakage values from refrigerants commonly used
12 in heat pump technologies used to electrify space and
13 water heating. Next slide.

14 This is a diagram taken from our AB 3232 work.
15 And the red, horizontal solid line is a systemwide
16 emissions target that AB 3232 seeks to meet or exceed.

17 As you can see, the green columns or
18 electrification impacts are much greater than the red
19 gas energy efficiency, or purple electric energy
20 efficiency impact.

21 So, does this mean that electrification can save
22 the day and allow us to exceed our SB 350 goals? So, if
23 we look at this very simplistically on the next slide,
24 then what we're showing here is we're taking our data
25 from 2019 and we've removed the small amount of existing

1 fuel substitution assumptions that were included there
2 for both the business as usual reference scenario, and
3 the aggressive scenario, and added in the minimum "what
4 if we met AB 3232 goal?"

5 So, you can see that the red line, which is the
6 reference scenario, still fall short of the goal, the SB
7 350 goal. And the green line, the aggressive scenario,
8 just meets it. But the question really is how feasible
9 this is. We're looking at a combined goal of electric
10 and gas energy efficiency, and we need to remember that
11 both this aggressive scenario for 2019 SB 350 and the AB
12 3232 compliance scenarios are based on an achievable
13 potential, not a programmatic business as usual
14 potential. Next slide, please.

15 So, we further looked into gas consumption and
16 how much gas would be saved with energy efficiency,
17 would be saved by the doubling goal, and could be
18 displaced by electrification efforts quantified in AB
19 3232.

20 And we found that, of course, gas and
21 electrification do compete physically, as well as for
22 program funding, but if we combine certain scenarios of
23 energy, of gas energy efficiency and electrification
24 scenarios, we could come into a sphere where we got non-
25 physical results. Meaning that we would potentially

1 look at displacing more than 100 percent of gas
2 consumption, which is not possible.

3 This means that we need to be very careful about
4 which energy efficiency and fuel substitution or
5 electrification scenarios we combine in our analysis for
6 2021. Next slide, please.

7 So, we are working with our contractor,
8 Guidehouse, on incorporating more program-oriented
9 inputs in our improved Energy Efficiency and Fuel
10 Substitution Analysis Tool for use in the 2021 IEPR.
11 Next slide, please.

12 This is a list of the programmatic elements
13 we've identified and are currently incorporating in our
14 electrification projections. This includes all of the
15 fuel substitution that is included in the Potential and
16 Goals, in the proposed decision. And last slide.

17 Once our data collection and analysis is
18 complete, we can aspire to understand what the
19 difference is between an aggressive 2021 SB 350
20 scenario, including electrification, and a reference SB
21 350 scenario including electrification. Last slide,
22 please.

23 Our goal for the 2021 IEPR is to shed more light
24 on the difference between our business as usual track
25 and the track we prefer to be on, which meets

1 California's energy and GHG goals. Thank you.

2 MR. CUTTER: All right. Hello, should I just
3 jump right in? All right, I am Eric Cutter.

4 COMMISSIONER MCALLISTER: Yeah, please go ahead.
5 Sorry about that.

6 MS. RAITT: I'm sorry. Yes, this is Heather.
7 Please go ahead, Eric, thank you so much.

8 MR. CUTTER: Okay. Thank you, Commissioner
9 McAllister and the CEC for inviting E3 to present on
10 this panel. We offer -- I'm Eric Cutter, a Director in
11 Distributed Energy Resources. We bring, you know, I
12 don't know, a good perspective in that we have been
13 supporting the CEC on the Title 24 Building Standards
14 that were just approved, as well as the CPUC on the
15 Avoided Cost update that Jessica mentioned.

16 So, if we go to the next slide. We'll jump one
17 more. So, stepping up there are two questions that are
18 causing some cognitive dissonance, you know, as we think
19 about electrification and energy efficiency in a
20 decarbonized world. And one is our avoided costs are
21 getting cheaper and cheaper. That's reflecting lower
22 cost renewables on the grid. And a lower carbon,
23 increasingly clean grid.

24 So, one question is what is the role of energy
25 efficiency in saving carbon, if our grid is getting

1 cleaner?

2 And the other is what is the role -- how do we
3 think about these two things together? On the one hand
4 we're saving energy, on the other hand we're
5 electrifying and increasing energy. Can't you give me a
6 framework or a metric to kind of think about all these
7 things in one place? And so, that's what I'm going to
8 dig into in a little more detail in this presentation.

9 Next slide. So, the first question is can we
10 add up and compare the savings of electrification and
11 energy efficiency and kind of put them in the same
12 bucket? And the short answer is yes.

13 The useful way to do that is what was -- in this
14 last cycle of the TDV for the Building Standards, we
15 developed, we the CEC, and E3, and all the stakeholders,
16 the source energy metric. And that does two things.
17 One, it moves from looking at the savings, you know,
18 just at the building to looking at the savings upstream.
19 So, we're going upstream to the source energy and taking
20 into account the fossil fuel burning at the source on
21 the electric grid, or on the natural gas side, and how
22 that's -- the relative contribution to our GHG and GHG
23 savings.

24 And two, it's looking over the long term. We
25 want to not just -- we want to look forward and reflect

1 that our planning is going to have lower and lower
2 carbon on the electric grid.

3 This example here is narrowed down for a simple
4 proof of concept looking at just the residential
5 building sector. On the right-hand side, looking at the
6 spreadsheets from the SB 350 Study that was just
7 presented, showing if we add up the source energy of the
8 electric savings and the gas savings, put that on an
9 equivalent basis, we're getting about half way to the
10 target.

11 On the left-hand side, doing a similar measure
12 for an electrification portfolio that E3 did for a study
13 with SCE, SMUD, and LADWP. And what was interesting is
14 it comes out fairly similar. So, it's on a comparable
15 scale, electrification and energy efficiency portfolio
16 in terms of adding up your source energy impacts. And
17 right now, you know, neither are getting quite as close
18 as we would like them to, to this doubling goal. Next
19 slide.

20 That was a short-term look. Looking over the
21 long term, this is looking at that electrification
22 portfolio. You do see, if I just straight line that
23 doubling of energy efficiency goal, with electrification
24 we're really, really emphasizing a lot of gas savings,
25 you know, after 2030.

1 By this metric, if we're again looking at the
2 source energy metric, you are starting to achieve your
3 doubling goal.

4 So, the main point here is we can use this
5 source energy metric and add up totals in a way that
6 reflects the decarbonization of the grid to show,
7 compare, and maybe stack up in the same bucket your
8 savings and your energy value of electrification, and
9 energy efficiency. And maybe the two together can add
10 up to -- get to our doubling goal. Next slide. We'll
11 jump one more.

12 So, obviously, adding up the energy is not, on
13 its own, sufficient. And it is really hard to overstate
14 the different planning perspective we're in with respect
15 to energy efficiency and electrification.

16 So, historically we've simply added up how much
17 marginal energy savings, and add up that value and the
18 emissions, assuming fossil fuel's on the margin.

19 What's really flipped the planning on its head
20 is we're now planning to meet a GHG target. And our
21 planning paradigm is we are going to meet that GHG
22 target. So, in a fundamental sense, energy efficiency
23 is not saving greenhouse gases. Which it is, obviously.
24 But what we're saying in our planning paradigm, we're
25 going to meet that target one way or another.

1 So, the real way we put all these in one basket
2 and reflect the value of energy efficiency compared to
3 electrification, compared to renewables is in how do
4 they help us achieve that target at a lower cost to
5 ratepayers? Next slide.

6 And that gets us to where Jessica led us off, on
7 really valuing the system value as opposed to just
8 adding up the therms, kilowatt hours, or tons. And so,
9 that is adding -- taking us -- like adding a step. I
10 just described the source energy metric. We're
11 reflecting the value of the time on the grid. You're
12 going to get more savings if you're saving on peak than
13 in the middle of the day. We're also reflecting that
14 the energy -- or, sorry, the carbon intensity of the
15 grid is going down over time.

16 And then our planning is assuming as we -- each
17 year we're going to be adjusting our portfolio to meet
18 that target. And energy efficiency is going to help us
19 do that at a lower cost. Next slide. Let me actually
20 jump two more slides.

21 I want to illustrate this concept using a recent
22 study, recent results from our CPUC IRP planning. And
23 the most apples-to-apples, kind of clear example of this
24 is actually using electric vehicles.

25 So, in the Integrated Resource Plan modeling,

1 we're modeling least cost portfolios to meet the GHG
2 target, the reliability targets under different
3 assumptions.

4 So, here are three plans we can compare.
5 Meeting a 38 million metric ton target. There is a base
6 case forecast from the latest IEPR that has, don't quote
7 me, but it's roughly 4 million electric vehicles by
8 2030. And then, we modeled two high EV scenarios that
9 get us to the 8 million EVs by 2030 goal. And we used
10 two cases with those, one with managed charging and one
11 with unmanaged charging.

12 And you can see on the right your unmanaged
13 charging has more charging on peak, less charging in the
14 off peak, and less charging in the middle of the day
15 when we have excess solar. So, how does that all add up
16 to our total system value? Next slide.

17 We can look at the incremental cost of serving
18 that EV load and with an unmanaged load shape. So,
19 we're not able to manage a lot of what's happening on
20 peak. The costs from a system perspective to serve that
21 load are \$600 million at a levelized cost of about \$60 a
22 megawatt hour.

23 If, instead, we are able to do load management
24 or vehicle/grid integration, that reduces that cost of
25 serving that load by half to about \$3 million, or a

1 levelized cost of \$30 a megawatt hour.

2 I want to emphasize this is just the system
3 perspective. It doesn't include all the avoided cost
4 categories of distribution and other things.

5 So, what's causing that cost that's reflected in
6 this modeling is the unmanaged load shape is requiring
7 us, the State of California, to build an additional 89
8 megawatts of solar and 327 megawatts of energy storage
9 by 2030.

10 So, you can think of energy efficiency in the
11 reverse. If we're able to save energy at kind of a flat
12 load shape, maybe we're saving \$300 million. If we're
13 able to target that energy efficiency or its flexible,
14 then we can save even more. And it's reflected in this
15 planning value to meet our low GHG target.

16 And I will stop there and let us get into
17 questions.

18 MS. RAITT: Thank you, Eric. Commissioner, did
19 you have any questions for Eric, or for the other
20 panelists?

21 COMMISSIONER MCALLISTER: Yeah, and can you hear
22 me okay? It looks like, so --

23 MS. RAITT: Yeah.

24 COMMISSIONER MCALLISTER: Great. Thanks.

25 Thanks to all the presenters. Eric, that was great.

1 And Ingrid, Coby, and Jessica, really appreciate your
2 time and attention to these issues.

3 And, you know, this is highly technical and a
4 little bit inside baseball just because it's -- you
5 know, we're talking in, really, California's language
6 about how we do and assess energy efficiency and
7 decarbonization. And so, you know, just recognize it's
8 not the most accessible conversation to folks who
9 aren't, you know, kinda doing this sort of thing every
10 day.

11 But with that said, I think it's super important
12 because this is what -- you know, these fundamentals,
13 it's really what our program funding, and evaluation,
14 you know, and directionality really is determined, you
15 know, on. So, really appreciate your day-to-day work on
16 this because it's super important.

17 I guess I wanted to -- so, it's interesting
18 that, you know, we've talked about -- so, the example
19 that sort of has come up repeatedly already today that
20 is sort of the clearest, I guess the clearest sort of
21 case study of how efficiency and decarbonization, you
22 know, do or don't sort of overlap and also, how they
23 operate relative to system issues has been EVs. It's
24 been the transportation sector, not necessarily the
25 buildings. And so it's bigger and maybe it's a little

1 bit simpler to think about.

2 I wonder, you know, how can we sort of make
3 buildings -- you know, Eric to your example, you know,
4 buildings also are a source of increasing load,
5 alongside transportation. And in, I think in practice
6 and certainly in theory they should be able to produce
7 downward rate pressure.

8 And maybe, I guess I'm looking for some comments
9 or some ideas on sort of how we can make sure that
10 happens. You know, sort of as you said, you know, we're
11 moving from -- as you said, Eric, you know, we're moving
12 from a kind of really operational savings paradigm in
13 energy efficiency to, really, an infrastructure savings
14 paradigm.

15 So, you know, how can we help that downward
16 pressure actually take place? You know, what are the
17 optimal programs we can do to actually make sure that
18 those infrastructure savings are realized? And
19 therefore, you know, 20 years down the road we're
20 actually having a conversation about a lower, you know,
21 a smaller rate base than might have otherwise been the
22 case.

23 MR. CUTTER: I can jump in and offer one thought
24 is what we are doing is really making sure that the
25 avoided costs that are used to value all the distributed

1 resources, including energy efficiency, are accurately
2 reflecting those cost savings at the system level.

3 And you've seen -- so, we just updated the
4 avoided costs for 2021 and came in for some criticism
5 that hey, you know, energy efficiency is less valuable
6 than it was in 2020. And that's true.

7 On the other hand, electrification is more
8 valuable. And also on the other hand, the timing is
9 more valuable. So, the avoided costs are showing better
10 value for being able to shift your load during certain
11 times of day. So, we want to keep that process going,
12 even as it, you know, may upset the apple cart a little
13 bit for some existing programs, but it helps us focus
14 our ratepayer dollars on the ones that are best, or
15 provide the most value going forward.

16 COMMISSIONER MCALLISTER: So, I guess just to
17 paraphrase, we can make sure that our programs -- I like
18 your sort of promote electrification differentially and
19 alongside that, also emphasize flexibility in order to
20 maximize that system benefit.

21 MR. CUTTER: Uh-hum.

22 COMMISSIONER MCALLISTER: Great. Anybody else?

23 MS. ALLISON: Something that I think comes up a
24 lot in the context of fuel substitution is just making
25 sure, firstly, that you're targeting customers, at least

1 in the early stages, that can really most benefit from
2 this type of switch.

3 So, an example, if you're focusing on customers
4 who are trying to install heat pumps, having people who
5 already have the air conditioner is a really great place
6 to start. And I think that's something that's been said
7 in the past. Because if they have that load already, by
8 switching to a heat pump you can actually achieve energy
9 efficiency savings and building decarbonization, which I
10 think is a really great strategy, especially when we're
11 trying to get the technology to a place where it really
12 optimizes the GHG reductions, and also can save people
13 money on their bill.

14 And that kind of segues into the second piece
15 that comes up for fuel substitution is making sure that
16 when we're creating these incentive programs we're not
17 just saying if it's an electric technology, it's the way
18 to go. I mean you have to say that electrification is
19 our goal, but then focusing on technologies that are
20 really high efficient in themselves. So that they're
21 not just electric, they're high efficient electric I
22 think is a really important piece.

23 And then, this doesn't reflect so much in bill
24 savings, but the refrigerant impact of the heat pumps I
25 think is really important, too. So, when you are

1 encouraging the switch, I think what you're switching to
2 should be a focus in addition to the fact that it's an
3 electric technology.

4 MR. CUTTER: Oh, Coby, you're muted.

5 COMMISSIONER MCALLISTER: Oh, I'm sorry, I'll
6 highlight that the 3232 Report actually also did focus
7 on the HFC, on the refrigerants issue as a key kind of
8 input to make sure that we do -- you know, as something
9 that's also necessary, but not quite sufficient to get
10 us to our 40 percent reduction goal by 2030.

11 So, Coby or anybody, did you have anything to
12 say about that?

13 MR. RUDOLPH: Yeah, just that, you know,
14 building off of Jessica and also Eric, I think that's
15 where we see our total system benefit metric coming in
16 as kind of like a great equalizer. Because with all
17 these different things going on at the same time,
18 refrigerants, move it fuel substitution to, you know,
19 move off of greenhouse gases that are emitted in the
20 building.

21 Savings on the electric side, they're just
22 difficult to deal with in isolation. And when you're
23 trying to throw a bunch of different requirements onto a
24 program or an energy efficiency portfolio, I think it
25 makes it, you know, really complicated and confusing to

1 administer. So, that's where we kind of see our Total
2 System Benefit metric coming in, providing a nice price
3 signal to say just, you know, here's the dollar value,
4 go after it. Whether it's from fuel substitution,
5 building electrification or, you know, from energy
6 efficiency directly on the electric or gas side.

7 COMMISSIONER MCALLISTER: Great, thanks for
8 this. I mean we've had -- it's interesting and I know
9 that staffs are working together across both
10 Commissions, but in the development of the Building Code
11 as we've heard from -- well, we've heard a couple times
12 today already, including Ingrid, you know we did move
13 towards this source energy metric in the Building
14 Standards. Sort of we have a now binomial, which is one
15 of the cost effectiveness, it's the time-dependent
16 valuation which we've always used, we always have had
17 that time component. And then, now layering on a source
18 energy metric.

19 And so, I think we've been moving in similar
20 directions and increasingly close together across both
21 Commissions to embrace the new sort of requirements of
22 investment that supports the grid and really maximizes
23 the savings to the grid, and also tries to maximize them
24 for the customer as well.

25 I think, now we heard this morning -- we heard

1 in the first panel that we are in this kind of strange,
2 a little bit of a no man's land sort of as we move
3 through this kind of where retail rates don't really
4 reflect the avoided cost, you know, that well. And so,
5 as we move towards a moment where that actually is the
6 case, I think we're increasingly, I think, across
7 Commissions targeting that same long term, which is
8 great.

9 I want to just congratulate you guys on the
10 system benefit metric and the avoided costs work that
11 you've been doing because I think that's real
12 fundamental.

13 Let's see, I guess Ingrid, did you want to
14 comment on that at all or can we move on to other
15 Commissioners?

16 MS. NEUMANN: I just wanted to agree that, yes,
17 efficient electrification is absolutely the way to go.
18 And I wanted to point out that one of the things we're
19 doing to improve our analysis for SB 350, as well, is to
20 actually have hourly GHG factors. So, that was
21 something that we worked on in support of AB 3232 and we
22 can incorporate that in our tools here, now. So, that
23 kind of gives different value for at least the GHG
24 component, depending on when that energy is being used,
25 like Eric pointed out.

1 COMMISSIONER MCALLISTER: Perfect. And I keep
2 bringing these other complementary initiatives up, but
3 the flexible demand appliance standards with SB 49, and
4 the load management standards that's really a web-based
5 platform that enables, you know, pricing to really play
6 out automatically and at low cost to the customer. And
7 get -- enable load flexibility.

8 We're hopeful that those will really unlock many
9 of the things we're talking about at scale, and at low
10 cost, really enable the time dependency of load to come
11 to fruition as we've been sort of targeting for a couple
12 of decades now as a state. So, really, happy about all
13 the progress jointly that we're making.

14 I want to just pass the microphone to any of my
15 colleagues. Commissioner Houck, did you want to ask any
16 questions?

17 COMMISSIONER HOUCK: I just wanted to make a
18 comment that all of this work is just really, really
19 critical and important, and I'm just very impressed with
20 everything I've seen. And just really, again highlight
21 the importance of efficiency, demand response, and load
22 flexibility. Even with moving to electrification we
23 still have supply chains that have carbon emissions that
24 we can't lose sight of. So, the less energy we're
25 using, the more we're able to move forward with those

1 emissions goals, even beyond the renewable sources that
2 we're talking about, and there's also cost implications
3 there as well.

4 So, we can't lose sight of those measures with
5 efficiency, and load flexibility, and demand response
6 even as we move to electrification.

7 So, I just wanted to say that I was very
8 impressed with the presentations and all of the work
9 that both agencies are doing.

10 COMMISSIONER MCALLISTER: Likewise. Very good.
11 Thank you very much. Thanks for being here today.

12 Let's see, do we have anyone else? Are we the
13 only two Commissioners that are still on for the
14 morning? I know a couple had to drop off at noon.

15 COMMISSIONER HOUCK: I think so.

16 COMMISSIONER MCALLISTER: Yeah, I think we are.

17 With that, well, the timing's perfect. I think
18 rather than ask more questions, which I could always do,
19 we have two panels in the afternoon that are really
20 going to dig into some of these issues. And the first
21 one in the afternoon at 1:45 -- or, no, I'm sorry, we're
22 going to start again at 1:30. And then the first panel
23 there is on the program side of things, and impacts of
24 different program initiatives, both from the agency
25 perspective and one from the market, from South Coast,

1 South Coast AQMD.

2 And then the second panel in the afternoon is
3 about building performance standards. And that came up
4 this morning in the first panel. And I'm really excited
5 to dig into that as a structure for motivating really
6 deep and important retrofits on efficiency
7 electrification and load flexibility going forward.
8 That's sort of less, a little bit less prescriptive and
9 more performance based. So, really looking forward to
10 both of those this afternoon. So, encourage everyone to
11 tune in again at 1:30.

12 With that, I think Ken can moderate the Zoom
13 Q&A. I think we have a few questions.

14 MR. RIDER: Yes, we have a couple. There are
15 two clarifying and one more substantive one. So, I'm
16 going to start with the more substantive one.

17 Meghan Duff asked, from AEA, about -- so, she
18 said: To your point about getting to the
19 decarbonization target either way, by way of energy
20 efficiency or clean renewable energy, how are the
21 embodied emissions of a clean grid reconciled since they
22 are avoided emissions via the energy efficiency, or
23 reduced demand pathway?

24 And I just will note, before we get to the
25 answer, we will have a workshop on embodied carbon in

1 the future, and encourage Meghan to attend that. But I
2 think it does apply here to the metrics as we're trying
3 to track credit for things.

4 So, I'll turn it to the panelists.

5 MS. NEUMANN: I can just say how we dealt with
6 this in the AB 3232 report. I mean we did add in the
7 incremental electricity added from electrification, or
8 that 1-to-1 substitution of a gas appliance, or let's
9 just say an electric appliance for an existing gas
10 appliance, or simply having new construction start out
11 that way.

12 So, of course, if you're adding that incremental
13 load in, then if you were, you know, being more
14 efficiency so you're adding a smaller load in, and if
15 said load is coming from a cleaner system, that added
16 GHG emission from electrification is very small compared
17 to how much you're removing by removing that gas
18 combustion. So, you always win out there.

19 MR. RUDOLPH: If the question is about embodied
20 emissions in equipment manufacturing or other kinds of
21 processes like that, I think I would just note that
22 we -- at least as far as I know, in our CPUC energy
23 efficiency cost effectiveness assessments, et cetera, I
24 don't think we include those kinds of embodied
25 emissions.

1 MS. ALLISON: We don't currently. And that's a
2 good point in the equipment side that we do need to
3 think about how some of these things are made. I mean I
4 know for the refrigerant piece of that we have like an
5 end-of-life factor. So, once it's, you know, no longer
6 being used we do consider the refrigerants that continue
7 to leak into the atmosphere.

8 And kind of on the other flip of it, as Ingrid
9 mentioned, when we are thinking about increasing
10 electrification we do try to consider like what the
11 impact of that load is. So, I know that's a pretty big
12 consideration in our avoided cost work that like as
13 you're adding more electricity is that electricity going
14 to be met with renewables, or with nonrenewables. And
15 that is a piece that we focus on and try to forecast
16 what that interplay might look like.

17 But there's always more work to be done. I mean
18 in our current methodology we definitely don't capture
19 all of those pieces. And I think that's part of the
20 reason it's so good that we do frequent, especially
21 avoided cost updates, because there's always an
22 opportunity to push the methodology further and bring
23 pieces like that in, if we don't consider it currently.

24 MR. RIDER: Well, I'm going to ask one of the
25 clarifying questions.

1 COMMISSIONER MCALLISTER: Ken, can I --

2 MR. RIDER: Oh.

3 COMMISSIONER MCALLISTER: I just have a -- a
4 question just came in and we didn't get a chance to
5 discuss it at a previous panel, but it's about cooling
6 as equity.

7 It's from Felicia Federico from UCLA. Maybe we
8 can include that one before we get to the clarifying
9 questions.

10 MR. RIDER: Sure.

11 COMMISSIONER MCALLISTER: Sorry to jump in
12 there. Yeah, thank you.

13 MR. RIDER: I'll just read it out loud to the
14 panelists: There was an earlier comment about starting
15 with people who already have air conditioning,
16 converting them to heat pumps because this will actually
17 reduce loads. This clearly conflicts with EJ
18 considerations since DACs, or disadvantaged communities,
19 will have far more people without air conditioners
20 currently, and these homes are unable to deal with the
21 rising temperatures or outdoor air quality
22 issues/wildfire impacts. How are you balancing these
23 issues?

24 MS. ALLISON: Yeah, I think that's a great
25 point, maybe I'll start there because I think that was

1 my comment. I do think, from a program design
2 perspective, focusing on people with air conditioning is
3 a good strategy. But that strategy should not be
4 pursued like, you know, at the expense of people in the
5 equity group. And I think that's really, really
6 important.

7 And that's part of the reason we drove the
8 segmentation change in the EE portfolio that we have
9 these three buckets, and one of the buckets is the
10 equity bucket. And the standards for assessing that is
11 different than normal, just resource programs, in that
12 we don't apply the cost effectiveness screen, and then
13 the success metrics are different. So, that bucket and
14 the reserved funding from that bucket, I think would be
15 a really good place to focus on homes that don't have
16 air conditioning. Because I agree that especially as
17 the climate gets hotter and we see these 116 days that
18 it is important to make sure people have what they need
19 to be safe.

20 And one place where that can be considered is
21 what we consider the baseline in energy efficiency,
22 whether or not the baseline is to have no air
23 conditioning or to include air conditioning. And as we
24 continue to gather data on what people need to be
25 comfortable, that information influences how we go about

1 assessing these programs.

2 So, I think my answer is two parts. The first
3 part is that the equity needs to continue on a separate
4 track to make sure people aren't getting left out. And
5 then the second piece is to continually update our
6 assumptions to make sure they're in line with what is
7 actually happening in Californian homes.

8 MR. CUTTER: It bears emphasizing that
9 electrification in buildings, more so right now that
10 some of the other sectors, there are -- segmentation is
11 important in finding the early wins that are cost
12 effective now. It is important to kind of build the
13 technical capability, and the workforce, and all that.

14 So, in some sense, obviously the equity needs to
15 be considered. In some sense, having the larger homes
16 with air conditioning go first, they're also helping
17 build that workforce with the early applications that
18 are more cost effective. So that the other measures for
19 the smaller homes and such can be cost effective sooner.

20 MR. RIDER: Great, so I'll move on to some of
21 these clarifying questions. This one's to Jessica. The
22 question is: Is TRC greater than 1 or TRC greater than
23 1 is a filter of what is allowed before considering
24 Total System Benefit goal?

25 MS. ALLISON: So, I maybe there might be two

1 parts to this question. If the part is -- if the
2 question is whether you have to have a TRC of 1 to be
3 included in that resource segment, the answer is no.
4 There will be many measures and technologies that aren't
5 cost effective that are included in that bucket. It's
6 just a question of adding in other technologies that are
7 more cost effective to even it out. So, cumulatively
8 the portfolio is -- or the segment is cost effective.
9 So, to that piece, no.

10 But then, if the question is about our goal
11 setting process and if only measures that have above a
12 1.0 TRC is included in the goals, that's probably
13 something that Coby can address in more detail. But
14 what the TRC cutoff is in that Potential and Goals Study
15 can vary from year to year, and it also varies from
16 scenario to scenario.

17 Like, for example, we have a scenario that has
18 like a 0.85 cutoff. So, it's not always 1. And the
19 reason for that is if you're shooting for a target of a
20 1.0 per segment, you obviously have to include
21 technologies that are higher and that are lower, or else
22 you'll end up with -- if you only do the one cutoff,
23 your ratio would be far above 1.

24 So, I guess no is the short answer, it's not
25 like a threshold.

1 MR. RIDER: Thank you. One last clarifying
2 question. This one is for Coby: Does this analysis
3 incorporate data on actual and not modeled energy
4 consumption before and after energy efficiency measure
5 implementation?

6 MR. RUDOLPH: Not directly. It's based on our
7 modeled savings, our modeled deemed savings. It's a
8 forecast, right, so it's not an analysis of savings
9 that's been achieved, it's a forecast of savings that
10 will be achieved in the following, in the next 11 years.

11 But we do have a feedback loop in our evaluation
12 cycle that, you know, where we look at existing
13 programs, evaluate them, look at the consumption data in
14 many cases, and then use that consumption data to update
15 our future forecasts. So, yes, not directly.

16 And then, Jessica's correct that we use a
17 variety of different measure level cost effectiveness
18 screens in our Potential and Goals process. And that's
19 really a methodological choice since our policy is that
20 an entire portfolio or portfolio segment of resource
21 programs needs to be cost effective. Every single
22 measure does not need to pass the TRC.

23 MR. RIDER: Thanks, Coby. That concludes the
24 Zoom Q&A.

25 COMMISSIONER MCALLISTER: Thanks Ken. I really

1 appreciate your being here all morning and helping usher
2 the conversation along, really helpful.

3 So, let's move on, Heather, to public comment.

4 MS. RAITT: Thanks. And thanks again to the
5 speakers.

6 COMMISSIONER MCALLISTER: Yes, thank you all,
7 that was great.

8 MS. RAITT: Jessica, Coby, Ingrid and Eric.

9 So, yes, and then we can go on to public
10 comment. Rosemary Avalos from the Public Advisor's
11 Office is here to help with that. Go ahead, Rosemary.

12 MS. AVALOS: Thank you, Heather.

13 Commenters, please allow one person per
14 organization make a comment. And comments are limited
15 to three minutes per speaker.

16 I'll first call on folks using the raised hand
17 feature. Sean Soni, your line is open. And you may
18 need to unmute on your end. Please state and spell your
19 name and affiliation for the record. Please go ahead.

20 MR. SONI: Okay, great. Good morning
21 Commissioners, staff, and panelists. My name is Sean
22 Soni, spelled S-E-A-N S-O-N-I. And I'm speaking on
23 behalf of the Southern California Gas Company, also
24 known as SoCalGas.

25 I wanted to take a moment to thank the panelists

1 for their insights during the morning session on the
2 importance of energy efficiency. The workshop further
3 emphasized the important role that utilities have on
4 statewide energy efficiency programs.

5 SoCalGas operates the largest natural gas energy
6 efficiency program in the country, from both the therm
7 savings and GHG reduction perspective.

8 At SoCalGas we view energy efficiency as a
9 partnership with our customers and this partnership
10 actually has been tremendously successful. We're ahead
11 of our commitment to achieve the aggressive energy
12 efficiency goals set forth by SB 350. In fact, over the
13 past five years our energy efficiency programs have
14 achieved more than 228 million therms in energy savings,
15 or 1.2 million metric tons of carbon dioxide reduced,
16 equivalent to the natural gas consumption of
17 approximately 145,000 households.

18 Now, energy affordability is a critical issue
19 that the state must address. Currently, approximately
20 31 percent of our customers are eligible for Low-Income
21 Energy Efficiency Programs, LIEE. This is a low cost
22 opportunity for a homeowner or renter to lower their
23 monthly natural gas bill. In fact, the average gas bill
24 for qualified customers is approximately \$31 per month.

25 Should SB 756 be signed into law, the number of

1 qualified customers would grow as it raises the
2 eligibility requirements from 200 percent to 250 percent
3 of the defined federal poverty levels.

4 SoCalGas supports this legislation and stands
5 ready to serve the needs of these customers.

6 And even with these successes, we believe there
7 are significantly more savings that can be achieved.
8 That is why SoCalGas is excited to be working with the
9 CPUC to increase the funding for energy efficiency and
10 weatherization programs, especially those targeting low-
11 income households.

12 Collectively, we must work together to identify
13 broadened pathways to engage hard-to-reach customers to
14 participate in energy efficiency programs.

15 And that is all. Thank you again for the
16 opportunity to provide public comments. Thank you.

17 MS. AVALOS: Thank you, Sean.

18 Now, I'll call on folks on the phone. And a
19 reminder, dial *9 to raise your hand and *6 to unmute.
20 I'll give a few seconds for those that are on the phone
21 to raise your hands.

22 Okay, seeing that there are no more raised
23 hands, this will complete our public comment. I turn
24 now to Commissioner McAllister.

25 COMMISSIONER MCALLISTER: Thank you very much,

1 Rosemary, really appreciate you and the rest of the
2 Public Advisor's Office. You do a great job.

3 I wanted to first of all just thank all of our
4 presenters from this morning. That last panel was
5 fantastic, so thanks very much to Jessica, and Coby, and
6 Ingrid, and Eric for that. That was a really kind of
7 robust discussion. And lots of follow up. I want to
8 really encourage -- I know this is happening, but I just
9 want to continue to encourage and just be explicit about
10 supporting, as I know all of my colleagues across both
11 Commissions do, that really intensive staff interaction
12 that really bears a lot of fruit. And we just want to
13 encourage as much of that as possible.

14 And so, it's just you can hear in the tenor and
15 just the alignment across the board here that we're
16 thinking about the big issues and trying to do that in
17 concert with our colleagues.

18 I don't want to make any summary comments
19 because we're right at 12:30 and I think we've just
20 heard so much content today, and lots of follow up on
21 both the first and second panel.

22 And also want to, again, thank Jessica
23 Granderson for making time to be with us.

24 The one thing that I'm trying to do as the lead
25 on the IEPR this year is to take every opportunity to

1 not only across the Commissions, you know, improve
2 communications, and just encourage collaboration, but
3 also between California and the federal government, and
4 other states. And that is going to bear tremendous
5 fruit. And I think we're in conversations at the
6 federal level at this critical time when there are big
7 funding conversations going on and we're likely to, you
8 know, get some number of billions or even tens of
9 billions of dollars coming to the state in some form or
10 another, based on the conversations that are happening
11 now in the infrastructure bill and the reconciliation,
12 including quite a bit of funding for -- as resources to
13 the state that we can administer as we see fit across
14 the commissions. And so, I'm cautiously optimistic
15 about having more tools and more resources in our
16 toolbox going forward here, in a couple of months or so.

17 And just want to thank again all the panelists,
18 and Heather, and the Efficiency Division, the IEPR team
19 and the Efficiency Division, as well as our colleagues
20 at the CPUC, who I know have provided a lot of input to
21 today's agenda.

22 And with that, I think I'll pass it over to
23 Commissioner Houck to see if you have any wrap-up
24 comments for the morning.

25 CPUC COMMISSIONER HOUCK: I just wanted to thank

1 everyone, the presenters and the participants, and I
2 look forward to hearing more this afternoon. So, thank
3 you again for including us in today's IEPR workshop.

4 COMMISSIONER MCALLISTER: Absolutely. We really
5 appreciate your being with us today.

6 So, on the screen there are -- that is the
7 information to make comments to the docket, on the
8 Building Decarbonization track. We really look forward
9 to getting everyone's written comments. It's just the
10 lifeblood of our process. So, those for today are due
11 on September 7th.

12 And please join us this afternoon. Information
13 is right there. And then, also join us on Thursday for
14 discussions about embodied carbon in the building sector
15 and refrigerants, which have come up several times
16 today. We're going to dig into that in the afternoon on
17 Thursday.

18 All right, so we will see everyone here at 1:30.
19 Back to you, Heather.

20 MS. RAITT: Great, thanks. So, yeah, just a
21 reminder that as shown on the slides that we have a
22 separate log in for this afternoon. So, hope to see
23 everyone at 1:30. Thanks.

24 COMMISSIONER MCALLISTER: All right. Signing
25 off for now. Thanks everyone.

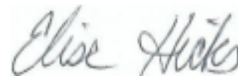
1 (Thereupon, the Workshop was adjourned at
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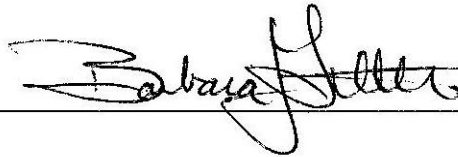
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