DOCKETED

Docket Number:	15-IEPR-05
Project Title:	Energy Efficiency
TN #:	205561
Document Title:	Transcript of the July 6, 2015 IEPR Joint Agency Workshop on the Governor's Energy Efficiency Goals
Description:	July 6, 2015 Workshop Transcript
Filer:	Laura Laurent
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	7/30/2015 9:57:31 AM
Docketed Date:	7/30/2015

COMMITTEE HEARING

BEFORE THE

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT

COMMISSION OF THE STATE OF CALIFORNIA

In the matter of,	)	
	)	Docket No. 15-IEPR-05
	)	
2015 Integrated Energy Policy	)	
Report (2015 IEPR)	)	

JOINT AGENCY WORKSHOP ON THE

GOVERNOR'S ENERGY EFFICIENCY GOALS

CALIFORNIA ENERGY COMMISSION

FIRST FLOOR, ART ROSENFELD HEARING ROOM

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

MONDAY, JULY 6, 2015

10:07 A.M.

Reported By:
Peter Petty

APPEARANCES

Commissioners Present

Andrew McAllister, Lead Commissioner, IEPR Committee

Robert Weisenmiller, Chair, CEC

CEC Staff Present

Heather Raitt, Manager, IEPR

Alana Mathews, Public Adviser

Shawn Pittard, Public Adviser's Office

Also Present on the Dais

Karen Edsen, California Independent System Operator (CAISO)

Tom Doughty, California Independent System Operator (CAISO)

Carla Peterman, California Public Utility Commission (CPUC)

Cliff Rechtschaffen, Officer of the Governor

Linne K. Stout, Department of Community Services and Development (DCSD)

Panelists Present

Steve Schiller, CEEIC

Peter Miller, NRDC

Jason Wimbley, CSD

Jonathan Changus, NCPA

Greg Wikler, Navigant Consulting

Obadiah Bartholomy, SMUD

Allison Smith, SoCalGas

APPEARANCES (CONT.)

Panelists Present (Cont.)

Talbot Gee, HARDI

Matthew Hargrove, California Business Properties Association

Aaron Johnson, PG&E

Snuller Price, E3

Cynthia Mitchell, TURN Consultant

Susan Stratton, NEEA

Linda Derivi, ALACC

Ralph Prahl, Prahl & Associates (Via WebEx)

Public Present

Rick Counihan, Nest Labs

Melanie Gillette, EnerNOC

Lisa Schmidt, HEA.com

Kevin Messner, Association of Home Appliance Manufacturers (AHAM)

Anna Solorio, Energy Efficiency Council

Peter Schwartz, LBNL

Karen Herter, Herter Energy Research Solutions

Joseph Oldham, Local Governments Commission

Dian Grueneich, Stanford University

Jodi London, Local Government Sustainable Energy Coalition

INDEX

INDEX

P R O C E E D I N G S

JULY 6, 2015 10:07 A.M.

MS. RAITT: Good morning. Welcome to today's Joint Agency Workshop on the Governor's Energy Efficiency Goals.

I'm Heather Raitt, the Program Manager for the IEPR. I'll go over a few housekeeping items. Restrooms are in the atrium. The snack room is on the second floor.

If there's an emergency and we need to evacuate the building, please follow staff to Roosevelt Park. It's diagonal to the building.

Today's workshop is being broadcast through our WebEx conferencing system and parties should be aware that you are being recorded.

We'll post an audio recording on the Energy Commission's website in a few days and a written transcript in about a month.

At the end of the day we'll have an opportunity for public comments. We're asking parties to limit their comments to three minutes. For those in the room, who would like to make comments, please fill out a blue card and give it to me. When it's your turn to speak, please come up to the center podium and speak into the microphone, and identify yourself. It's also helpful to

give the court reporter your business card.

For WebEx participants, you can use the chat function to tell our WebEx coordinator that you'd like to make a comment during the public comment period. We'll either relay your comment or open line at the appropriate time.

For phone-in participants, we'll hear from you after we take the WebEx and in-person comments.

If you haven't already, please sign in at the entrance to the hearing room, where there are materials for the workshop. Written comments are welcome and due on July 20th. And the notice provides instructions for how to submit comments.

And with that, I'll turn it over to Commissioner McAllister.

COMMISSIONER MC ALLISTER: Great.

MS. RAITT: Also, just a note, we have the Public Adviser here to help with blue cards and there's a table in the back for that. Thank you.

COMMISSIONER MC ALLISTER: Great. So, Alana's headed around that way.

Thank you all for coming. My name is Andrew McAllister. I'm the Lead Commissioner on Energy Efficiency, which we're going to talk about a lot today. I'm really looking forward to today.

And also, by chance, also the Lead Commissioner on the IEPR, the team for which is led for Heather and has put this workshop together today.

Before I make any detailed comments, I want to really just thank you all for coming. A lot of familiar faces. Lots of knowledge in this room, both in the room, in the audience, and on the panels and at the dais here. So, I want to thank everyone who came from the various agencies. I won't do that specifically right now.

In just a minute, want to get more into the nitty gritty here. But this is not just an IEPR workshop. This is, actually, first and foremost a workshop about Governor Brown's goal for doubling the energy efficiency of our existing building stock. We're going to talk about what that means and we're going to talk about the bigger context.

And to do that, we have Cliff Rechtschaffen, who's a really core part of the Governor's energy team, and drives a lot of these discussions and helps us marshal our -- helps us get organized and marshal our thoughts in a constructive way across the agencies, and really making sure we're all coordinated under the Governor's vision.

And I want to -- we're going to present a couple

of graphics here that Cliff can walk us through, briefly. But I wanted to just thank Governor Brown for his vision and leadership. It really helps to have the backup from the highest levels to do important things, which is what we're trying to do here in California. And it's just critical to have his support, and his vision, and leadership on this. And that comes channeled right directly to Cliff.

So, thanks Cliff for being here.

MR. RECHTSCHAFFEN: Thank you very much. As Andrew said, this workshop's part of a much larger effort that's represented in the graphic here. We have a lot to do. We're keeping you very busy. This is an exciting week, we have workshops -- three workshops this week.

This is part of our effort, as articulated by Governor Brown, to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030. That's part of an Executive Order that was issued in April.

In the State of the State, anticipating that, the Governor set out goals for five large areas, including renewable electricity, petroleum reduction, energy efficiency, making our natural land syncs and reducing short-lift climate pollutants.

And along with that, we have a far-reaching plan

for making our State safer to deal with the impacts of climate change, the Safeguarding California Plan. Heather.

We're guided by some very broad principles here, transforming to a clean energy economy that makes sense environmentally, and also economically. And we're doing that. We're achieving our climate goals, while our economy's growing fast and outpacing growth in the rest of the nation. We're also integrating our drought efforts to save water and supporting our vulnerable communities.

This just gives you a sense of all we have going. Right now, to implement the goals in both the State of the State and in the Executive Order we're going to need a lot. We're going to need to do a lot. There's a lot of interest and activity on the legislative front to implement the Governor's goals and to pursue other priority areas.

The Air Resources Board is going to embark on an updated scoping plan process, later this fall, that will try to bring together a lot of these efforts.

And then you can see, beneath that, some of the proceedings that we have going, which is why you really, really will be very, very busy. And there's proceedings on energy efficiency that many of you have participated

under AB758, that's been chaired by Commissioner McAllister.

We're going to launch, in a few weeks, the next three-year investment plan for cap and trade revenues. And then there are also ongoing efforts and stakeholder efforts to deal with healthy soils, short-lift climate pollutants, healthy forests, transportation, and so forth. And this is going to require unprecedented collaboration among local governments, state governments, with the public and private sector.

Again, there's going to be a workshop on the Governor's transportation goals on Wednesday, at CalEPA and there's going to be one on the Governor's renewable energy goals on Thursday. And if anyone wants more information, any of us on the dais going provide it. Those are posted, I think they're on all, the CEC, the ARB, and the PUC's websites.

So, that's situating this in the larger context of what we're doing. Just to add one editorial comment, this is really an unprecedented opportunity we have. We've rarely, if ever, had so much momentum, interest and focus on improving energy efficiency in our building stock. We now recognize how important it is. Governor Brown has elevated that as a central goal.

It's very interesting to us, in the

administration, because in some ways it's the least controversial of our goals. How could anyone be against waste, not wasting energy efficiency? But for many reasons, that a lot of you are familiar with, there's lots of barriers to getting there. There's no technological silver bullet that's going to get there. So, it may be the hardest goal to achieve and that's why we need all of your imagination, your efforts. Don't worry if something sounds a little outlandish or outside of the box, we need to have that kind of thinking, those kinds of solutions to double the savings we're getting from our existing building stock.

So, all ideas are welcome and we look forward to the discussion today.

COMMISSIONER MC ALLISTER: Thank you very much, Cliff. I hope you can stick around for all the day. That would be terrific.

So actually, Heather, could you go back to that last slide just for a second? Sorry.

So, as Cliff said, just to contextualize this, in the upper right there on this slide is the AB758 energy efficiency plan, the action plan. There's a fairly complete draft on the street right now, as of a few months ago, actually. And we're actively updating that and hope to get it adopted sometime this fall.

But the ideas in there, the big ideas aren't going to change much. You know, the details will change a little bit as we got quite a few comments from the public and stakeholders.

So, the coincidence, really here, is that we've been working hard on the 758 action plan, which is from legislation a few years ago. And the Governor's goal really does sort of dovetail very, very well with that plan. It's maybe put a little bit of steroids into the discussion here because -- or adrenaline, you know, pick your metaphor.

But we've got a lot of groundwork laid is the point and some momentum going forward on a number of energy efficiency fronts that I think are quite -- that have the potential to be quite transformative. And what we want to talk about is how we can ensure that they're transformative.

And the topics on the agenda today, I think are pretty critical and certainly relevant for the legislative conversation that's going on right now. So, very much looking forward to that.

Let's see, I guess I want to go on, now, to a graph just to frame this discussion a little bit more. So, this is a graph that sort of tries to help you visualize the role of energy efficiency. Or this

savings goal sort of specifically.

So, the orange wedge is sort of what we are already trying to do. It's committed energy efficiency.

So, let's see, let me just make sure that I'm going to -- I'm going to explain this correctly. This is something very similar to the graphic that's in the 758 action plan.

So, I'm sorry, the committed actually don't even show here. The committed energy savings are things we've already done, and they're codes and standards that exist, they're appliance efficiency standards that are already in enforcement.

Then the incremental savings under development are, really, the additional achievable energy efficiency that's part of the forecast discussion and is an additional sort of wedge. Okay, we think -- we're going to go after this and we think we're going to get energy efficiency going forward. So, that's based on the 2014, the 2013 and 2014 forecasts. So, there's an AAEE wedge for those of you who are initiated in that process.

So, the blue is the doubling of that. And that's what we really -- those are the incremental, additional, you know, doubling energy efficiency. And that's where we really need to go deep. We need to get deeper savings, we need to get more broad savings across

the economy, across the built environment.

And overall, if we get both, what we're planning for already, which is the orange and the doubling of that, which much of which is going to depend on the success of the strategies in the action plan, and what we talk about today and beyond, then we're also going to get that blue.

And that will constitute, essentially, a 17 or so percent drop in energy use versus what would have happened, what we think would have happened.

And I'll just point out that California already has -- you know, 17 percent may seem a little sort of not big and round, but California already has among the most efficient economies in the country. We've been doing this for a long, long time. There's not a whole lot of low-hanging fruit in the traditional sense.

And, you know, reversing the absolute increase in energy consumption would be huge, okay. So, this represents a 17 percent drop in what would have happened and a slight drop in absolute energy consumption in the State, of a couple percent.

So, that would be massive. I mean, given the economy will grow, the population will grow between now and 2030, to have absolute consumption drop would be a quite important thing for California to do, and it would

show huge leadership on our part.

And we need to do that for any number of reasons that I won't go into now, but that is really important. It's part of the overall integrated planning process that we need as we de-carbonize our electric sector, as we try to electrify where we can to reduce area emissions from combustion. And as we, you know, keep our air quality goals in mind and as we really, simultaneously, work on transportation and all the other areas.

So, this is a really key strategy for making sure that we optimize our electricity grid, and our energy systems generally, so that we can minimize the investment in that infrastructure and move the investment where it needs to go for the clean energy economy.

So with that, I wanted to just highlight that. You know, I encourage all of you to have a look at the AB758 action plan. That's sort of a key input into this discussion. And I'm really looking forward to the conversation today.

So with that, I'll wrap up. And I wanted to permit the other folks on the dais here to say a couple of introductory comments.

I want to really thank Linne Stout, Karen Edsen,

Commissioner Carla Peterman, from the PUC, Chair Weisenmiller, and Cliff, again, for being here with us. And I want to give them some opportunity to frame the discussion from their various perspectives.

So, I'll start with Chair Weisenmiller.

CHAIR WEISENMILLER: Thanks. I want to thank everyone for being here today. I think it's a great opportunity. I think, certainly, the Governor has framed the issue as greenhouse gas emissions. Greenhouse gas emission reductions is not how much renewables, it's not how many billions we spend on energy efficiency, it's results.

And I think looking -- well, it's time to really do sort of a zero-based thinking on our efficiency programs and this is a good opportunity. We're really going to hit the mark.

I mean, many of us have been struggling in energy efficiency since the '70s, in terms of what to do about existing buildings. And, you know, frankly, we've not moved that needle very much. And we're talking about really huge potential. We're talking about an area where because of the rented housing issues, and the unique challenges there, you know, many of our low-income citizens are in rented housing or rented space. And so, we really need to figure out how to move the

needle there.

And I think 758 is a start, but I think it's time to get really serious. So, thanks.

COMMISSIONER MC ALLISTER: Thanks, Chair Weisenmiller.

Commissioner Peterman.

CPUC COMMISSIONER PETERMAN: Thank you, Commissioner McAllister. And thank you, Energy Commission, for hosting this workshop as a part of the IEPR series. It's a pleasure to be here today, with everyone on the dais.

I think the fact that you have so many different agencies represented here really just shows how energy efficiency is critical to the mission of all of our agencies.

And for those of us who follow the Public Utilities Commission work in this area, there's a lot going on.

And I want to say, first, you know, thanks largely to the folks in this room, we have been successful in reaching our energy efficiency goals to date.

When you look at the results from the 2010-2012 funding period, we exceeded our targets and have reduced greenhouse gases enough to be equivalent to taking a

million cars off the road. And so, there's a lot to be proud of.

But I think, collectively, we do have the question; is it enough? If we're trying to reach the Governor's goals, is it a matter of scaling the programs we have or do we need some fundamental changes to our energy efficiency delivery.

At the Commission, we're currently working hard to institute the rolling portfolios. And the rolling portfolios allow us to move away from the stop and start funding of energy efficiency, and some of that uncertainty that all participants face, to really focus on implementing programs that work, being able to pull back programs that aren't successful, scale up other ones. You know, sooner than a three-year period.

So, I think that's really going to help a better implementation of our current programs. But again, even though we have that funding is it being directed in the right manner is an overall question.

When the Governor's goals came out, you know, as a Commission we started looking at proceeding to say, you know, how do we start teeing up these questions for a potentially greater programmatic change.

We're looking at these issues, some of them in our phase three. But I think the timing is right, now,

to hear from all stakeholders since we have so many interesting legislative proposals before us.

So I'm looking forward, today, to hearing your feedback on all of the topics that are part of the agenda. They're not specifically scoped into Commission proceedings, and so looking forward to the high level discussion.

I'll encourage you to not use this opportunity to litigate specific issues before the Commission because they will be used by all the parties there.

Instead, use this as an opportunity to talk to all of us about, collectively, what you think we need to be doing. Thank you.

COMMISSIONER MC ALLISTER: So, Karen Edsen, from the ISO.

MS. EDSEN: Thank you, Commissioner McAllister. I, too, am pleased to be here on behalf of the California Independent System Operator. I'm really here to listen to all of you, on behalf of our organization.

The way that energy efficiency is brought into service directly affects our operations by lowering the demand that we're serving.

There are new technologies that may become interactive with us and with demand in ways that are not, today, foreseen. So, this conversation is really

critically important to us.

And, of course, our optimization systems for dispatching are really about efficiency, to make sure that we're calling on the most efficient resources at that wholesale level to serve load. So, this is another component of that, that is much deeper into the system.

I look forward to today's conversation.

COMMISSIONER MC ALLISTER: And Linne Stout, from the Department of Community Services and Development. Thanks for being here.

MS. STOUT: Good morning. I appreciate the opportunity to participate in this workshop. And I wanted to just provide a little bit of brief comments about the Department of Community Services and Development.

The mission of the department is to reduce poverty by leading the development and coordination of effective and innovative programs for low-income Californians. Working with a statewide network of nonprofit and local government, community-based organization, the department's primary objective is to provide services and support to help low-income people achieve and maintain self-sufficiency.

These basic services include employment support, such as job training, and childcare, and basic support

such as food, shelter, and utility assistance, which may include emergency assistance to prevent home energy shutoff, and emergency home heating and cooling repair.

And, of course, weatherization services improve energy efficiency, helping to reduce energy costs, while improving health and safety.

Because of the very limited resources that families have, improving the energy efficiency of their homes helps them to meet their other basic needs.

With the funding that the department received from the Greenhouse Gas Reduction Fund, we're able to provide additional benefits to income-qualified households, living in disadvantaged communities, by installing solar PV and solar water heating, in addition to the other energy efficiency measures.

And we're also using the funding to provide services within the large, multi-family buildings.

Along with the Governor's commitment to alleviate the conditions of poverty by increasing the minimum wage and creating a State earned income tax credit, investing in disadvantaged communities through energy efficiency will provide an opportunity for families to live healthier lives and have the additional resources to meet their basic needs.

And again, I appreciate the opportunity.

COMMISSIONER MC ALLISTER: Absolutely. In most other states, the state energy office, which would be the CEC, actually administers those weatherization assistance funds that come from the Federal government. But in California's case, it goes over to CSD. So, we actually coordinate quite a bit in trying to fend those funds federally. And, therefore, work together with CSD, but I think we could even deepen that relationship. So, it's great to have you here on the dais. Thank you very much.

So with that, so we've already -- I think we're already about ten minutes behind, so we'll try to catch up. Lots of pressure to the panel.

But let's move on to panel one. Really looking forward to the discussion. Thank you very much.

So, Heather or directly to Steve, I guess.

MS. RAITT: So, yeah, Steve Schiller is our first speaker, from California Energy Efficiency Industry Council.

MR. SCHILLER: Great, thank you very much. I want to thank the Energy Commission and those on the dais for the opportunity to speak here.

So, I want to point out that we're in the room that was named for the original visionary of energy efficiency. And so, it's a great honor to be here and

talking in the state where it has efficiencies first, in the loading order.

However, for all the words that we're saying and will be saying today about the importance of efficiency, really, let's face it, historically efficiency has been a footnote in the noise. It's not really been taken seriously by resource planners.

The way I look at it is efficiency is the first mentioned, but it's also the first forgotten.

When I refinanced my home, the appraiser was very interested in the PV system on my roof. But when I asked her if she wanted to look at my efficient heating system, I might as well have asked her if she wanted to look at my stamp collection.

You know, efficiency's invisible. We need the PV on the roof for efficiency for consumers, but we also need this form of hard commitment to make it truly visible for the energy and air regulators, the resource planners, for the administrators of the efficiency programs and, really, for the market.

But things are changing. Efficiency is moving from the noise. As Cliff mentioned, the Governor wants a doubling of efficiency. A lot of money is being invested. New efficiency companies are popping up every day. And, importantly, it's something that ever

consumer can take advantage of. Including, as has already been discussed today, our low-income energy consumers.

Also, while hidden, the number of efficiency workers seems to exceed the number of people working in any other energy field in our State. And they can find us in every county and in every legislative district here, in this State, and in the country.

So now I want to turn to the questions put before the panel, and my initial comments feed into that. Making efficiency a priority, taking it beyond first-mentioned and first-forgotten through policies, regulations, and programs, and data.

So, the first question was about targets. Energy efficiency resource standards, I think, provide the spark, the drive, the steroids, or adrenaline, as the Commissioner mentioned. The punch to do all we can do, cost effectively, for wasting less energy.

The California Energy Efficiency Industry Council is the sponsor of a bill in the Legislature, AB1330, authored by Assemblymember Bloom. It sets a reasonable, minimal level of efficiency to be achieved throughout the State by both public- and investor-owned utilities.

Among other benefits, it puts into code the

Governor's, the Administration, and the Legislature's leadership's objective of doubling efficiency in our building.

In terms of goal setting, AB1330 is based on the performance and potential of our State, as has been documented in a number of studies, public studies, as well as looking at the performance in other states.

With respect to the potential studies, I believe Greg's going to be talking about this more in his presentation. What we're looking to do is to move the achievable potential much closer to the economic potential. There's a huge gap between what's considered economic and what's considered achievable.

In part because we're working on potential studies, and consuming current policies, and practices, and historic levels of consumer demand we can get closer to that. And, actually, we have to kind of get closer to meet our State goals.

We're currently achieving about one percent electricity savings from efficiency and about half of that for natural gas.

AB1330 moves this up to a floor of two percent for electricity savings per year and one percent of natural gas savings by 2025.

About half the states of our country also have

an EERS, Efficiency Resource Standard. And, actually, a few states are already meeting the AB1330 target.

I guess a question to you all is, if Massachusetts can do this today, why cannot California do it within ten years?

And AB1330 does not tell the market, the utilities or agencies how they have to do this. It provides flexibility for doing what works best in each market, each sector, each service territory, with oversight by the PUC and the Energy Commission, working collaboratively in a public process.

One area, though, that this bill does set some direction is give a priority to our disadvantaged communities to ensure they are not left out of the opportunities that come from these programs.

So, now turning to the themes on non-utility customer, I have four items I want to point out and we can talk about those during more in discussion.

First of all, the distinction between utilities and non-utilities is going to be changing. We had a change in the utility world with the Grid 2.0. And there's an essential role for the utilities in managing the grid. That clearly puts them in the middle of energy efficiency, but not as a sole owner of the market.

The utilities should value savings and procure it like they would any other resource in terms of what technologies and market approaches rise to the top and fall. This will be based on market forces.

Second, there's a supply and demand element to efficiency. The supply push of energy efficiency solutions and the demand or pull of consumers for such solutions. The demand/push is very importantly addressed, at least in part, in the AB758 report and plans that the Commissioner mentioned.

And as I'm sure Jonathan and I know, we've discussed this and we'd point out, voluntary programs are voluntary. And so, therefore, we need to drive demand.

Thirdly, a consumer perspective, a customer side of the meter solution needs to be looked at for these solutions. Whereas the regulators might differentiate between DG and efficiency, or storage and demand response, from a consumer point of view, this is really looking at packaging it together.

And fourth, the efficiency industry has always had a performance and financing element. But for large-based solutions, in particular, I think it will become more important as we can do better measurement and verification, and have better data.

Now, in terms of the analytical requirements, which is the last question, I have five areas that I want to point out on that. And again, we can talk about those more, as there might be questions for it.

One is around saturation studies. We need more saturation studies to evaluate what's actually being consumed by the clients. Some of these studies in the State are 10, 20 years old. And for some sectors, like the industrial, they've never happened.

We also need consistent reporting of the efficiency impacts, consistent reporting between all the parts of the wedges that the Commissioner mentioned. Including, you know, consistent reporting for IOUs and POUs.

We need an increase in access to -- an increase to access and more confidence in the savings data. You know, this is an important area and there's a number of solutions we can do for that.

We need updated avoided costs. We have changing policies and the avoided cost profiles and the cost definitions we use need some improvement. At least additional data. And we need more potential study data to really look at what we can do with greater market penetration and with the advanced policies and programs that our Legislature and our Governor are doing.

So with that I want to say, you know, we have a Governor, a Legislature, and agencies that signal California's efficiency leadership, and an energy-efficiency resource supports this by providing the end of efficiency is the first mentioned and first forgotten. It provides the floor, the spark, the push, I'll start saying adrenaline, for innovation in government utility and private sector solutions.

We know we need to do this and we can. Thank you very much.

COMMISSIONER MC ALLISTER: Thanks very much, Steve. We're going to hold the questions until everybody's had a chance to speak and then we'll sock it to you.

MR. MILLER: Thank you for the opportunity to speak here, today. I really appreciate the focus on energy efficiency. I think the comments to the effect that it's widely supported, but maybe the most difficult to achieve is well taken. It's really an area in which it's going to take a collective effort and it's those thousand pennies on the ground, or whatever metaphor. I guess we're going to be working through a lot of metaphors here, today. But this kind of collective effort is really essential to it.

So, I don't have a long statement, but I can

just offer a couple of talking points this morning to start us off before the discussion.

We very much support setting a goal. We think the Governor's taken the leadership on setting a broad goal. We think detailing that and putting it in legislation could be a useful way to focus efforts on policies and programs that are needed, that are not currently in place. They're needed to help us move forward and achieve our goals.

As well as focusing on issues that we have with current policies that need to be fixed or changed.

Which goes to say that setting the goal, alone, is not sufficient. It's necessary, but it's not a sufficient condition. We're going to have a lot of work to do over the next 15 years to getting to that 2030 target.

And efficiency is an essential part of getting to our overall State environmental and economic goals. The reduction from the doubling, that was shown this morning, I think provides a good frame. By 2030, we'd be going beyond the basic flat per capita consumption, that we've seen over the past decades, to a substantial reduction. Something like a 20 percent reduction in per capita energy consumption by 2030. And that's the kind of aggressive, ambitious goals that we'll need to

achieve the environmental benefits and economic benefits that we're focused on.

One of the key aspects of getting to achieve that goal will be improvement in terms of the statewide coordination and collaboration.

Right now, there's a fair bit of siloing with different agency efforts at the PUC, the CEC, the CSD, ISO. And I think we need to increase coordination and collaboration at the statewide level. Particularly for energy efficiency, for example, we need to move beyond different savings estimates for different programs. There should be a collective effort so that programs can cross agency boundaries and achieve greater savings levels because of the coordination.

Another area in which we've seen some siloing is POU and -- public utilities and private utilities. So, to the extent that we can coordinate programs within the State across agency boundaries, we'll be more successful.

That extends to beyond State boundaries. There are our neighbors to the north and to the east have programs that are expanding, in part because of the Federal program, the Clean Power Program. And we should take advantage of that and work with our neighbors to have regional programs that will certainly increase our

effectiveness.

We're in support of the bill, AB1330, that the Energy Efficiency Industry Council has sponsored. We've offered a couple of proposed amendments. We think, in particular, focusing on gross savings, if you will, more, you know, what the overall impact on energy consumption is, and less on who's responsible for it is going to be helpful.

Really, we're all in this together and if we start -- if we have an overwhelming focus on who gets how much credit, we're going to dilute our effectiveness. So, the important goal is that we achieve this together. We rise together or we sink together and that's where the focus needs to be.

So with that, I look forward to the conversation, the discussion, but I'll pass it on to my colleague to the right.

COMMISSIONER MC ALLISTER: Thank you.

Next we'll hear from Jason Wimbley.

MR. WIMBLEY: Yes. Well, thank you for the opportunity to participate in this workshop and weigh in on the Governor's goals for achieving energy efficiency and some of the State's environmental goals related to GHG reductions.

My points are going to be very direct and brief.

I think that the statewide targeting for California electric and gas electric activities will definitely an important foundation for achieving all forms of cost-effective energy efficiency, and will certainly spur certain market and program design transformations within both utility and non-utility programs.

The emphasis for programs to pursue deeper energy savings and pursue a greater energy savings returns from investments is pivotal.

I see cost effectiveness standards evolving to more in line with program designs oriented to achieving all forms of cost effective energy efficiency per investment.

Also, there's going to be a need to integrate -- within the integrated resource planning, there will be an additional value placed on non-utility energy programs and it's going to be essential, at the State level, that these programs that are often administered by separate departments are combined and leveraged to optimize energy efficiency benefits to the communities that they aim to target and serve.

In addition, we would encourage utilities to build stronger connection and methods to effectively leverage the contributions these program have to offer in terms of energy efficiency and other beneficial

resources.

This program integration will be particularly valuable in overcoming various housing and socioeconomic challenges within the multi-family and low-income program sector, as examples.

Also, there's siloing. You know, we, as a department, we administer a variety of different energy efficiency programs that target low-income communities. And most recently, we have utilized the greenhouse gas reduction funds to spearhead energy efficiency in solar renewable projects focused in the disadvantaged community areas.

But I can say that it's been difficult to assess what your targets are, when you really don't know what's been done already. We know that California is rich and plentiful in energy efficiency resources, and we know that those energy efficiency investments have produced some benefit to the State, and also to the low-income communities that we're targeting.

But without having access to real information, it's really hard to assess what level of work and saturation has been already accomplished and, really, what energy efficiency opportunities remain that we should target.

In addition, encouraging more effective

targeting and delivery of building upgrade services I think is going to be an important strategy that we should embrace.

Many programs, such as low-income weatherization, for example, utilize prescriptive measures that's like a one-size-fits-all approach to addressing the energy efficiency needs of low-income families. But realizing that with the emergence of technology, with smart meters, the smart grid decision, and smart metering we have a wealth of data that's available to us, that we could utilize to perform certain analytics to better assess how energy's being consumed within these homes. And we can target our investments more appropriately and more effectively.

But I think the current approach that we're utilizing misses out on opportunities because, again, it's kind of a one-size-fits-all, and we often ignore some of the deeper energy efficiency opportunities that are there.

In addition, I think that in order for us to accomplish our work and contribute to this overarching goal there has to be a combining of resources at the very ground level.

Currently, you know, there are different service delivery mechanisms that guide the implementation of

these individual programs. And in order for a consumer to access these programs, they have to navigate many channels and many pathways to gain access to these programs.

In the context of low income, this can be significantly burdensome when in order to access these programs, there's a huge overhead that the clients have to expand to access these resources.

So, there needs to be thoughts given to how we can improve the current delivery systems that we're utilizing to make them more effective, to avoid redundancy, and have them more specifically targeted to certain objections and achieving maximum and deeper energy savings within existing buildings.

COMMISSIONER MC ALLISTER: Thank you.

Jonathan Changus.

MR. CHANGUS: Great, thank you. Yes, Jonathan Changus with the Northern California Power Agency. And I have a lot of positive things I want to say and I'm in agreement with both Steven and Peter, who have been working closely on a number of these issues. But I want to get the slightly negative part out of the way, first.

It has to do with how we go about the approach we take to get to a statewide doubling of energy efficiency in existing buildings.

And I think we see a resource standard, especially when it's kind of modeled off of the RPS, which is solely focused really on utilities. And this is the fact that we do have a siloed approach. There are a lot of areas the State is heavily involved across multiple agencies in helping us achieve greater efficiency. And that we agree that there needs to be increased effort to pursue the energy savings that are still locked up in existing buildings.

But I think we're concerned that something that is really focused on just the utility programs, and this is the larger spectrum of the E programs, and we would support something that has more of a truly statewide approach to try and bring in the savings to try and capture how that works.

Now, I was asked, in particular, to talk to the non-utility programs' challenges and opportunities. And I think whether it's a utility program or a non-utility program, we need to start with kind of a common focus, which is on what is going to motivate the customer to make an investment in their existing building?

And one of the strengths, I think, of the AB758 action plan is that it starts off with not only, I think, a comprehensive review of the existing programs that the State is offering, as well as utility options,

but it also captures and characterizes some of the challenges unique to different customer segments, single-family, multi-family, small commercial, large commercial, industrial and ag.

And we really, while we're trying to adopt a statewide target, we're going to need to have more targeted approaches that recognizes the needs and distinctions between those customers. I guess, kind of along the way that what we discovered with the drought and water conservation targets, and expected reductions, is that it wasn't a one-size-fits-all across the State. It's that we had to geographically recognize that there are some differences.

And I think there is a significant similarity in EE, as well, in the different customers classes, and bearing by geographic location and different utilities.

The second part is that a lot of these are going to be voluntary actions. And to the extent that it is going to be voluntary action on a customer, on a building owner to do this, how are we making sure that our policies and programs are not unintended discouraging. As we adopt and try and figure out new regulatory regimes, codes and standards is hugely impactful.

There's current policies being considered about

baseline. I think that's kind of a critical policy to figure out what we want it to be. Because, from figuring out what the baseline is going to be for energy efficiency programs is going to be dictating what the potential targets are, how we calculate progress.

I think that there's a lot of technological innovation that's going on right now, that we're trying not to get in the way of, as well. While we're trying to push and be encouraging, there's a lot of things going on, the communications, the NES, the remote, the appability [sic] that are empowering customers to be able to control and manage their energy use that haven't taken, necessarily, a lot of utility-funded dollars to do it. It's something that is delivering a service that the customer wants. And trying to figure out, okay, how can we build off of that?

But there are going to be, still, I think, a critical role for utilities in trying to help breakdown the silo approach that we have in the forms of communication, education, outreach. We're really trying to make sure that whatever the customer situation is that they are equipped with the tools that they are knowledgeable -- how they, in their unique circumstance, can save energy. And that's difficult.

Energy literacy is about as high or maybe lower

than our financial literacy, in general. And so, I think there are ways that we, as utilities, frequently as a trusted energy advisor can partner with the State on some of those education outreach efforts.

I think the final point that I'll make is there's a tremendous opportunity here, but there's also going to be a significant amount of technological development. We're going to have the electrification of transportation, which is another overlap that we're not really talking here.

So, as we set our goals for EE, I think it's important that we recognize, A, how some of the other trends, as far as distributed generation and electrification, may change the fuel source. And so, when we talk about energy efficiency, that if there is a fuel switching component, that that's kind of built in to the targets and accounted for. Such that, if you see an increase in electricity, that's not a negative if it means that we're spending -- we're having greenhouse gas savings because of the fuel switch.

So, I think I'll leave it at that and wait for comments.

COMMISSIONER MC ALLISTER: Thanks very much.

All right, Greg.

MS. RAITT: Welcome.

MR. WIKLER: Good morning. Greg Wikler, with Navigant Consulting. I wanted to thank the Commission and the agency commissioners and officers here today for giving me the opportunity to speak about energy efficiency.

I'm going to first start with a short presentation, I promise a short presentation, on the goals and potential study, and then address some of the questions that were posed for this panel.

So, the next slide. So, there are four primary elements to the goals and potential study that we are working with the CPUC on, currently. And I'm just going to focus on task one, which is really an update to the previous potential studies that had been undertaken by the CPUC, and conducted by my company over the last several years.

What the task one effort is really intended to look at is updating the goals for the purpose of supporting the 2016 and beyond time frame in the first generation of the rolling portfolio cycle for goal setting purposes.

We are also engaged in a number of tasks that are looking at, for example, working with the CEC and the IEPR forecast scenarios for additional achieved energy potential, or AAEE scenarios.

And we're also working, through the CPUC, on looking at the effect of energy efficiency targets for greenhouse gas reductions, as well as the strategic plan update, and some of the metrics that need to be looked at to help inform that updating process.

The next slide, Heather. So, this is one of multiple stages of efforts that we're undertaking. So, what we're involved in right now is what we're calling stage one. We didn't want to get confused with the phases of the energy efficiency proceeding, so we're doing stage one that is essentially supporting the 2016 and beyond goal setting process. And it relies on a lot of data, that is available, to essentially provide that update.

We will be looking, under stage two, at a number of issues, including some possible changes to the methodology and ways that EE potential is calculated, addressing baseline changes that were referenced here, this morning, as well as cost effectiveness analysis, emerging technologies and looking at a broader coverage of those measures, as well.

The next slide. So, this is just my spaghetti chart that just shows you where the data sources are coming from. A lot of sources are CPUC-vetted studies that have been used to essentially help us inform the

updating process for the potential update.

And then we also, as any potential study relies on literally thousands of data sources, so we have non-CPUC sources, as well, to help inform the analysis.

The next slide, please. So, this is just an illustration. I don't want to get into the details here, but this is just taken from our last study where we were tasked with creating different scenarios of energy efficiency potential. And if we focus on the mid column there, it just essentially shows what was the potential, the parameters that essentially defined the potential analysis for goal setting purposes, in the previous proceeding.

And then, the high scenario was used for the IEPR forecast, to look at what might be additional energy efficiency achieved.

And we can see that there are a number of parameters, you know, things like incentive levels, payback criteria, discount rates, things along those lines. But the analysis was somewhat limited to what parameters we could change in the analysis going to the high case.

So, I just wanted to point this out, that there are probably a number of other things that aren't included on this table, that would need to be considered

to really look at what is the potential when you go to, you know, essentially doubling the savings opportunities.

The next slide. This just gets us into some of our results. And rather than spend time going through the specific ones, I just wanted to point out a few things.

I think Steve mentioned, earlier, that achievable potential is quite below the economic potential. And you can see, on the right-hand side there, the lowest line, the greenish line, that's achievable potential accumulated through the year 2024.

And the next line up is the economic potential. So, to Steve's point, we're at about 50 percent of economic potential.

The question that is, of course, on my mind is, well, why couldn't we get more? You know, what are the factors that limit us from getting to higher levels of potential? And I think we'll talk about that, certainly, in today's discussion.

Some of those factors relate to the policies. Other factors relate just to the pure economics and how much incentive is being provided to customers to offset their first cost, et cetera.

If we move to the next slide, we'll see that

this is the gas side. And you can see that that achievable line is considerably lower than the economic potential. In this case, it's about a quarter. So, unlike the electric side, where we were saying achievable potential is about half of economic potential, on the gas side it's about a quarter.

What's driving that? Why couldn't that be higher? And one of the things that -- or a few factors that come to mind on the gas side is, unlike electricity, where you have a whole host of different end uses and measure types, with different lifetimes and such, the gas side you have a lot of long lifetime equipment end uses, so turnover isn't as common or frequent, as it is on the electric side.

So, the opportunities for savings are more limited in time frame, certainly in a 10-year time frame.

And then, you know, the low avoided costs on the gas side. Gas is cheap in the State. And that is, I think, a driving factor in terms of the customer economics as to how much uptake there could be in terms of potential.

The next couple of slides just show us the -- this is on the electric side, the percent savings. Sometimes the percent savings can be quite informative

of how much achievable or market potential there is. And we can see on the electric side, this is just by sector, one of the noticeable things that you can see on most of the -- at least with the residential and commercial sectors is the precipitous drop in potential at 2018. And that has a lot to do with codes and standards on the lighting side that come into play.

If you look on the right-hand side, those are total results, percent of sales that also include codes and standards efforts, and the efforts the IOUs are doing in terms of code advocacy.

So, when you add in those parts of the equation, you actually see 1.4 percent climbing up to 1.6 percent, and then dropping down a bit after the code is put into place. I think this is just helpful illustration and good for context in our discussion today.

The next chart just shows that same calculus on the gas side.

So, that was the potential study. I promised it would be brief. I wanted to just spend a couple of minutes talking about some of the questions that were posed to the panel today.

And on the first question, in terms of how will setting statewide target for all California activities be leading to greater levels of savings?

So right now, there are mechanisms for IOUs and POUs to achieve energy efficiency savings. The targets are set based on current policies and various mechanisms are put into place to ensure that those targets are met, compliance filings, shareholder incentive, things like that.

One question that I wonder about is who is responsible for ensuring that the savings are -- that the targets are actually met?

You know, the CPUC certainly has the jurisdictional oversight over the investor-owned utilities. The CEC oversees the POU activities. But sometimes I think there's confusion in the marketplace as to who is truly responsible for ensuring that those savings are actually being met.

And it might be worthwhile to consider some organizational structures. I know that probably scares a lot of folks, but thinking about, you know, would there be one entity, like a demand side management office, that could kind of oversee, set the goals at the broad level and then make sure that the various agencies are reaching those goals, or what they're doing to make sure that those goals are being met.

So, some of the examples of the non-utility initiatives that have been put into place. I think

AB758 is a great example, Prop. 39, where those are sort of cutting, you know, cross-cutting initiatives or efforts that help enhance the achievement of energy efficiency.

I think it's important, again to my earlier point about coordination and having that single entity that would oversee and be responsible. In this context, you know, certainly having AB758 is extremely important. But I find that in the marketplace there is a bit of confusion as to who is actually going to implement various elements of that. Is that the IOUs? Is it the POUs? Is it other entities. So, having a little bit more clarity around organization might be helpful.

Finally, some of the analytical requirements. I, like Steve, have about five areas that might be considered.

First, I'm a fan of potential studies. I've been doing potential studies for about 28 years, now. So, I think that having a statewide energy efficiency potential, not just the IOU-specific, or POU-specific, but having a statewide energy efficiency potential effort might be very helpful.

It would also assess the interplay between different -- not only the different agencies that are responsible for implementing energy efficiency, but also

the different resources that are being put into place, now. So, you have different, you know, distributed resources, renewable energy, storage, and things along those lines that, no question, are going to have an impact on the magnitude of savings. So, having a cross-cutting assessment, at a statewide level, I think would be very helpful in terms of trying to set some broader goals and really drill down to what's the true potential.

Second is assess some different policy approaches and their effect on energy efficiency potential. So we know, from the information that I just presented, you know, that we're at best reaching about one percent of savings each year, at least projected in the future.

But much of what we look at in the current round of potential is very much a function of current regulatory policies. So, if greater levels of certain energy efficiency measures would be permitted to be counted, say for example, like equipment, certain behavior-based initiatives, operational efficiency, strategic energy management, things along those lines, also emerging technologies, we might be able to see greater levels of potential at least stated. And, hopefully, achieved.

The third area is to broaden the analysis framework to include opportunities for non-equipment energy efficiency measures. So right now, our analysis approach and our models are really, primarily focused on equipment replacement.

However, with the advent of more granular energy use data, smart meter data, better tools out there to help customers use that data to improve their energy usage on an ongoing basis, some of those measures, if you will, should be looked at and given more emphasis.

Of course, to do that we have to really think about how we measure the effectiveness or evaluate the effectiveness of those efforts. But it certainly would be an important area to look at.

Fourth is to -- I think to analyze load impacts of energy efficiency measures at more points in time. Right now, we really look at the annual savings associated with energy efficiency measures, and then we look at peak demand, or demand at certain times of the year.

I think, unfortunately, to get to a level where we need to be, and I say unfortunately because it does involve a lot of data, we really have to go down to looking at hourly impacts. And even looking at impacts at a regional level. That is, perhaps, more than just

climate zones, but looking at sub-regions. What is happening at a feeder level, for example, as opposed to just at a climate zone level in terms of impacts, and the magnitude of those impacts. I think that that's kind of the direction that we probably need to go.

And, finally, I think we need to reevaluate the way we look at cost effectiveness. Right now, our framework limits or quantifies the benefits to just being more or less a one-dimensional perspective, where we assess the avoidance of the most expensive energy-generating resources.

We might need to include in our frameworks, at least provide for additional benefit streams from avoiding carbon, and other non-energy benefits that -- such as the value of production, and things along those lines.

And I think we need to reassess the assumptions around discount rates and possibly get more granular with certain discount rate assumptions based on different customer groups.

So, that was all I had to say from my prepared remarks. Thank you, again, for the opportunity.

COMMISSIONER MC ALLISTER: Great. Thanks very much.

Let's see, so I guess, I think we'll probably

start with the dais, but we're going to try to keep it economical so we can try, and that's the operative word there, so that we can have some time at the end, in 20 minutes or so, at least, for public questions. Hopefully, more than that. But to deepen the conversations in ways that we might not be thinking about, from the dais.

So, I guess, so I want to thank you all for your presentations. You really teed up a lot of great issues. And, you know, just a couple of points that maybe we can elucidate a little bit more.

You know, absolutely agree that, really, many of the questions we have here are structural in terms of, you know, I think the point that Greg had just made about who's responsible for what. You know, you go through 758 action plan and there's a list of partners, with one of them kind of assigned responsibility for each thing. But that is completely subject to comment. And, you know, want to try to find out the right structure to do that.

We've proposed one in there and we absolutely want comment about it. And right now, we're primarily thinking the PUC and the Energy Commission need to establish some kind of body that really keeps fingers on the pulse of what's going on in the marketplace, and

what the policies are achieving or not. And then, bringing in the other agencies when the topics are relevant to them.

But, you know, certainly putting those responsibilities where they belong and then having some transparency and accountability which is really, I think, what we all want, would be great to hear.

Second, so goal number two in the action plan is data. There's a whole bunch of stuff in there about data and you've mentioned a few things.

And I wanted to just key off something that Jonathan Changus said, which is absolutely agree, and it's very intentional, that the action plan focused on the broader marketplace and not just utility programs. It's absolutely I completely, 100 percent agree with you that we can't just be talking about ratepayer-funded programs, we have to be talking about market transformation.

Having said that, in that context utility data is no longer just a utility issue because the marketplace needs better data in order to make better decisions.

So, how do we get there? okay, and we can parse that in a number of different ways.

But I think, Jason, you also mentioned that,

that better data to make better decisions and form not only customers, but the marketplace. We need to figure out how to make that happen.

So, you know, that conversation, I think, is just increasingly important, both at the Energy Commission, but sort of within these walls, you k now, we want data to make better policy, to implement policy in a more efficient way. But also, figure out ways that we can kind of balance the customer privacy concerns with really getting data in the hands that can use it most innovatively.

And, obviously, both the agencies, the Public Utilities Commission and the Energy Commission are concerned about this, and working together on how we can negotiate that field.

And third, behavior is huge. Greg, you mentioned that. And how do we not just focus widgets, but focus on choice.

And that then brings up the issue of, okay, well, what if it doesn't happen? Voluntary programs are voluntary. Somebody said they're -- okay, what's the end game in terms of when do we go mandatory, if we really are serious about getting these goals, right. So, I think that's a little bit of a touching subject but, you know, we live in a democracy and it's hard to

mandate things.

But they are completely robust and in everybody's best interest, maybe we need to think about what that might look like.

So, I'll just kick off with one question and then we can bounce around from the dais. So, I'm really interested in, Steve, your view of the agency roles, sort of the intent of 1330 and kind of getting a handle on what the Energy Commission will be asked to do? Sort of, at least current thoughts on that. And what, you know, if we are thinking statewide, and we are thinking of sort of trying to be consistent, we are thinking about relative authorities over IOUs and POUs, sort of how, in your conception, does that change, if it does, the Commission's role, the Energy Commission's role in kind of overseeing this effort or what -- you know, doing certain analytical pieces?

MR. SCHILLER: Thank you. I don't see a huge change in the roles for the Energy Commission or, actually, for the Public Utilities Commission here. Because of the mandate that would be put on this for the savings, there would be more of an enforcement role.

But in terms of your procedures and processes that you would use, although there's a floor target set in the bill, that doesn't mean that the agencies, both

Energy Commission and the PUC working together, could establish that a different goal would be appropriate. You know, presumably, a higher goal. That you would still have the interest in continuing with the potential studies, the proceedings, the oversight roles that you would have.

The way 1330 is currently written, the Energy Commission, in collaboration with the PUC, has responsibility for coming up with a statewide consistent manner in which the savings are defined and then documented, or measured.

And then, specifically, there's an oversight role for the POUs that the Energy Commission has, and the investor-owned utilities, and the CCAs for the Utilities Commission.

So, one of the things within this is that it's saying there's a floor target. Now, continue with your processes that you have to make it so. So, in some ways you could say that things are the same except for, instead of using the proceeding to come up with the targets for the investor-owned utilities or, you know, the processes internally for the public utilities, that there's a floor. It is consistent with the Governor's goal. It's consistent with what we need to do, you know, for our overall State goals.

And that, from there on, you know, that's the change is that there's a floor there. But I think the other processes would continue.

Now, I think per some of the discussion here, you know, can't hose processes work better in collaboration among the agencies? Absolutely. I think that, you know, there are certainly a number of comments people could have about the efficiency of the regulatory processes that take place and the timeliness. I'd say that one advantage of having these targets, you know, perhaps as you might -- you directly have the experience within RPS, is it provides some forest for the trees.

And so, when there are these decisions down in the nitty gritty, in the details about how a measurement verification, you know, a custom energy efficiency project is going to be assessed that there's something there that says here's the forest. We've got to get these savings. This is what we're doing. And so, I think it can help provide that direction for the agencies, and their staff, so that they can see where they're going. And I think that's what we want to do, we want to achieve this.

COMMISSIONER MC ALLISTER: Well, I guess I'm thinking there needs to be some kind of analytical resources. Maybe it already exists and I'm just not

aware of it. But just sort of to look at disaggregate the codes and standards impacts from it actually occurring, from voluntary programs, all that kind of stuff, that becomes actually really important to do if we're going to -- you know, as part of the forest. So like, and doing it for POUs and IOUs.

And sort of, you know, that seems like a big task that is kind of underplayed right now and I'm just trying to make sure that we don't get caught, or either agency gets caught sort of having something that turns out to be a big deal, but without resources to do it. So, I think that's really what I'm asking.

MR. SCHILLER: Well, first of all, I've always been very supportive of both agencies, particularly the Energy Commission in its role, and how it's funded, that it has the resources to do the job.

And I think there's two elements to this. And, I think, again, the panel's talked about it and I think others would probably have input on there. One is data. Just nerdy data. And it's data at the macro level, it's data down to the micro level, it's data in between. And we need more of it.

And I look at the Energy Commission as the place that needs to do that and the resources need to come to the Energy Commission so they can do that.

You know, we need database assessments, database work here. And, you know, the Energy Commission, I think, is going to have a greater task. You have the Demand Analysis Working Group. I think that's, you know, a starting point for this work. But, certainly there is a need for much greater data and for that data to be open and available.

In terms of assessing the targets and things such as baseline, that's an issue that's been going on, you know, for three decades at least and sort of assessing that. In trying to sort that out, as we have an aggressive State here, with an aggressive codes and standards, is differentiating between the codes and standards savings in what, you know, is applicable there.

I think that is an area, you know, perhaps why we're seeing a particular bill, numbered 802, is trying to get to the frustration of figuring out how do we see the forest of getting the overall savings yet, you know, crediting appropriately where the actions are.

And it's a tricky issue and it's going to take some time and effort. And we'd certainly like to see that coordinated between the agencies, and the work there, irrespective of what happens with 802.

But it's difficult. The situation with existing

conditions, for example, for the low-income community. Do we want to have existing conditions be that for the low income? Because existing conditions means, frankly, a lot of them don't have proper services. Is that the right one?

On the other hand, when we have growing codes and standards, as Greg pointed out, is that the right way to set a baseline for, say, a commercial property. You know, and have situations where the code's actually -- the actual efficiency action could trigger a code.

So, there's some work that needs to be done there. You know, there is work to be done. So, I think the overall responsibilities that I mentioned before, I think are consistent before and after an EERS. But the amount of resources, frankly, that you're going to need to put into it, I think are going to increase.

COMMISSIONER MC ALLISTER: Great, thanks. I'll bite my tongue for a second and give Commissioner Peterman a chance to ask a question.

CPUC COMMISSIONER PETERMAN: Well, I'd be interested in hearing your response, Commissioner McAllister, but I'll pose a couple questions, first.

I think, you know, I'm still trying to get my head around, perhaps, some of the same questions Andrew

has in terms of the actual target setting and kind of, ultimately, what we'll have to do as a Commission as there will be some type of residual energy efficiency need that we'll have to direct the ratepayer programs to do.

But in order to do that, we still have to identify what's the impact of codes and standards? What's been the impact of CSD's programs, you know, for low income, Prop. 39? And so, I think we're just trying to figure out how this process makes that more efficient.

Yeah, a broad question I have for you, first, Steve, is how would you recommend we would approach this to make sure this, then, doesn't set a minimum energy efficiency goal? Well, I mean it is a minimum energy efficiency goal. But then what's -- I mean, how do we make sure that it's not a ceiling, if you will?

MR. SCHILLER: Well, that's by these fantastic appointments that our Governor has made to our commissions, I think is our first point for that.

But I think that's -- you know, that's the process you'd have. So, you would continue the work of, say, the potential studies, or the other work, and the other assessments of looking at this. And, you know, you can raise the goal as appropriate.

And that goal might be raised for one utility versus another, depending on what's their situation, or for one market or another. So, the goal certainly could go up.

In terms of the question about how does this make the process more efficient? I'm trying to think of the right way, so let me just come out and say this. This bill, itself, does not speak to the efficiency of the process. It says here is the forest, here is the goal, we need to do this.

And now, our responsible agencies see this and it's their responsibility to make this work. And the tools that you have are the tools that you have to do that. You know, I guess that's part of the decision you can make in terms of the Administration's recommendations. Do they want further guidance from the Legislature on how, specifically, to achieve things?

And I think that, you know, for me it's appropriate for the Legislature, and then the Governor, if he so decides to sign it, is to set these goals. And then, for the agencies, the utilities, and the marketplace to figure out how to deliver it and to deliver it efficiently.

CPUC COMMISSIONER PETERMAN: And then my second question, a few of you mentioned just the importance of

thinking about energy efficiency in the context of some of the other developments that are happening in the energy sector, and where are we going on renewables and transportation electrification.

And so, given that there's this interaction with all these other resources areas, can you see an opportunity for setting energy efficiency targets as part of more of an integrated resource planning approach that includes other resources, versus setting a separate target for energy efficiency, as has been proposed with the resource standard?

MR. SCHILLER: I want to make sure I get to the panel, so I'll try to be really quick. So, there's two elements to the 1330. There's the demand response and that is a target setting, you know, that basically asks the agencies to work on a target setting for the demand response.

And in that, it specifically calls out that there's consideration of electrification, distributed generation and storage, and that be looked at for the target setting.

Within the energy efficiency, you know, this is clearly -- people can have different perspectives here. You know, your integrated demand side management proceeding, I think is very important, that Commissioner

Florio is the lead commissioner for. That we really, as I mentioned, need to be looking at this on the customer's side of the meter. From the consumer's point of view and the market's point of view is one thing.

However, we do need to stop wasting less energy. And so just because there's other elements to it that I think are important in terms of this integration about how we make this grid work, to have a -- essentially, moving towards a carbon-free grid and this integration is very important. But a starting point, first, in the loading order is let's set some reasonable target for not wasting energy.

In the ERRS, I think there's the -- there was mention, actually Jonathan mentioned this, too, the importance of electrification. The current version of the legislation specifically says that the electricity associated with electrification for vehicles is not counted towards the goal, so we don't have a disincentive for electrification.

The laws, as associated with storage, are not included. And for natural gas vehicles, also on the gas goal, that charging of -- or the fueling of natural gas vehicles doesn't count towards the goal. So, we don't have a situation where the different goals that the State has are in contradiction.

COMMISSIONER MC ALLISTER: Yeah, go ahead, Karen.

MS. EDSEN: Steve, you may have started to get at this a bit. So, at the ISO, of course, we're about operating the system and trying to make sure that we're operating it reliably and as efficiently as possible. Well, we do our best.

But it's, of course, getting increasingly complicated with the greater complexity on both the supply side and the demand side that we deal with. We're doing a lot, ourselves, to try to allow aggregation of behind-the-meter resources to participate with us. But we also look at wanting more consumption certain times of the day and less other times of the day.

So, tell me how that -- you touched on this a bit. If you could say a little more and maybe, Peter, you can add to this as well, how we can better account for that in terms of energy efficiency?

MR. SCHILLER: You want to try that one, first? It's a tricky -- actually, yeah, Peter, take a shot at that first.

COMMISSIONER MC ALLISTER: I want to put a finer point on that. So, I want to put a slightly finer point on that, as well.

So, you know, essentially what we're talking about is the ISO has got to know that resource is there. And there are all sorts of attributes, other than kilowatt hours. You know, not all kilowatt hours are created equal and that's going to, increasingly, more so be the case as we go forward, right.

So, I guess in a procurement environment or, you know, we're talking about sort of a structure of what this looks like. I guess how does -- how might we encapsulate energy efficiency in a way that respects those system needs and unpack the attributes?

You know, and I'm wondering if your DR kind of thought -- your DR approach kind of tries to do that and that's what you're trying to do there, or how do you propose kind of -- if this were to take place, how would it fit, as Commissioner Peterman was asking with, say, a procurement regimen or with all the other resources that are on the grid?

MR. SCHILLER: So, you know, efficiency can work as a demand response resource. Demand response is, in itself, though, a separate piece in that we're looking to respond demand both economically or for emergencies.

And so, you know, targeting that clearly, that's going to be locational, time-based, you know, I think I'd mentioned. And others have mentioned the importance

of looking at that and, again, back to the better data to addressing that.

You know, the Efficiency Resource Standard is an annual target. It's really speaking to let's just, you know, waste less energy here. You know, the concern about should we just have everybody turn on their lights at 4:00 in the afternoon? I'm not quite there, yet. You know, it's going to counter everything I've said to my teenage daughters for many years here.

So, I think that things that we're looking at, I think looking broader, I just have to feel that to use the energy efficiently is fundamental. I can't say otherwise in Art's room here.

But there's other things we can do. And I think, again, that's been brought up. There's storage, there's electrification, there's looking at an overall system of grid management. And, you know, I think that's a responsibility on our utility partners in this is that looking at the overall system and having the policies that before we tell people to turn on their lights at 4:00 in the afternoon, I'd rather have them charging their car, for example.

COMMISSIONER MC ALLISTER: Well, Peter, if you have anything?

MR. MILLER: Yeah, I mean, I think you've

touched on what is really an exciting and challenging area going forward. In which, you know, what we've had in the past is three non-overlapping areas, demand response, storage and energy efficiency. You can see the VEN diagram has those circles enlarged and start to overlap. And there are technologies that will be hard to distinguish between, you know, is it energy efficiency, is it storage, is it a demand response measure?

If you're turning on your air conditioner during the night and storing the cool so that you can use it during the day, maybe you're reducing demand overall as a result of that, and maybe you're increasing it a little bit. But you're able to adjust the time in which you're consuming it. You're storing the energy in a form that helps to lower costs overall.

So, I think you've got a challenging job at the ISO in trying to send the market signals that will encourage behaviors and technologies that help to address challenges of meeting grid needs.

And it's an exciting area going forward. I don't think it needs to overwhelm the overall goal that we need to increase our energy efficiency and improve our use of energy efficiency technologies.

MS. EDSEN: Yeah, I want to be clear. I'm

certainly not suggesting that we shouldn't be as efficient as possible. I think to the extent that we face the challenge of -- the prospect of having too much power certain times of the day, that what you want to do is find a productive use for that, that further decarbonizes the system. Which is certainly what our goal is and what we're trying to accomplish.

But it does, you are in a circumstance where you could be increasing demand of one kind or another. That it sounded, Steve, like you were suggesting vehicle charging doesn't count in some fashion. I wasn't quite clear on how you would account for those kinds of changes in demand, in accomplishing the energy efficiency goals, themselves.

MR. SCHILLER: So, the way the energy efficiency target should be set, and assessed, is what the results are from energy efficiency activities. You know, we don't want -- we, being I think the State, don't want a situation where it's not the efficiency activities that are being assessed towards this target. So that, you know, if a business shuts down, that's not a good thing and we certainly don't want that to be a credit towards energy savings in the target.

On the other hand if, you know, someone's charging their vehicle and the consumption goes up

because it's towards our State goals, as you just said, you don't want that against.

So, in the legislation it talks about exempting charging and storage losses from the target setting. So, if it's two percent per year, the electricity consumed for charging isn't used in that calculation of the two percent.

On the other hand, you know, this is from decisions to be made. I think, you know, for all the agencies up here, I want to include you, also, that if we have a situation where, you know, for a low-income tenant, that they now actually have heating in their home, or they actually have lights, you know, they have LEDs, instead of incandescents, so they can now afford it. And they go from not turning on the lights to turning on the lights, I don't want them to be disadvantaged, either.

You know, because of the nature of efficiency, and the facts, et cetera, it becomes a difficult situation. But we're looking at the target achievement is based on results from efficiency activities. And we don't want to disadvantage other things, like you're talking about here.

Let me just apologize real quickly, and just sort of mention, we saw as one of the benefits of an ERS

is that it actually provides some certainty for you, for the ISO, as well as for CalEPA, or the CARB in terms of the climate goals, because there's something you can point to. And I know this has been an issue in the past. It says, you know, here it is in statute, this is the kind of savings we're going to be getting and that gives you more to count on as resource planners.

MR. MILLER: I wonder if I could add something, as well?

COMMISSIONER MC ALLISTER: Yeah, go ahead.

MR. MILLER: I think the way I think of the EERS and the energy efficiency goal is I think we've become a little bit complacent in terms of our energy efficiency efforts as a State. And I think of the goal as an admonition that we need to redouble our efforts.

And I think, Carla, this goes to something you asked earlier, how do we assure that it isn't seen as a ceiling, instead of a floor?

I think we currently view our goal as something of a ceiling. And we currently -- the language in code, in statute is aggressive. All cost-effective energy efficiency. We see that as a minimum and that we can go beyond that.

But I think too often in policy it's seen as a floor. And we're overly cautious. And we take the

position that we certainly don't want to give utilities credit for things that might otherwise happen. We have a very conservative approach to calculating cost effectiveness. We don't count below-code savings, even though we all know that there are many buildings out there, existing buildings that aren't up to current code, and are unlikely to get there for a long time.

So, there's a number of ways in which we artificially and inappropriately constrain our energy efficiency effort. And I think adopting an aggressive and ambitious goal is a kick in the pants. It's an admonition that we need to redouble our effort.

And if, ultimately, we get to 2030 and the goal says two percent, and we're at 1.9 percent, I think we can view that as, you know, a big effort. You know, we're currently at one percent. That's a lot more than we're currently at. We think we could probably go beyond the two percent and we don't want to see it as a ceiling, and we can get to 2.1 or 3 percent.

We need to try a lot harder. We need to take off the shackles. We need to really take a look at what we're doing and ensure we're really being as aggressive as possible.

CHAIR WEISENMILLER: Okay. Yeah, I have a couple -- yeah, go ahead.

MR. CHANGUS: Just a quick response is that so far this conversation as focused really on utilities in the State. And I haven't heard, yet, how any of this motivates customers to make the voluntary actions it needs to do.

And I think that's part of the challenge. I strongly disagree that an EERS doesn't create a significant new regulatory regime, instead of building off of the existing structure. It's additional to AB758, instead of working off of what the CPUC and the CEC have current been working, as well as utilities.

Secondly, we're talking as if we don't currently have utility goals and expectations. Public power set a record for the amount of dollars it invested in or helped customers invest in EE last year. We had near record energy savings reported.

And so, I get the idea that there's stagnation, maybe, but it's not on the public side of the ledger.

And so, I just want to be cautious that while we're trying to push and the Governor has set an aggressive new goal, the idea that both the State and utilities aren't committed is something that I do not agree with.

MR. RECHTSCHAFFEN: Jonathan, I just want to follow up with something you said in your opening

remarks. Were you saying you don't think a statewide target's appropriate, there should be specific regional targets, or more targeted programs as opposed to a statewide resource goal?

MR. CHANGUS: No, I think that a utility-specific and utility-only goal, which is what we get with AB1330, doesn't capture the Governor's intent or a truly statewide process. So, I think a statewide target is something that we could discuss and should be talking about.

CHAIR WEISENMILLER: Okay. So, three areas I want to hit quickly, though they're hard. One of them is that the basic metaphor we're using is some sort of integrated resource plan going forward.

And I guess what I'm trying to understand is there's a variety of entities in the State that do things. I think the statistic for the POUs is 42, the top 997 percent of the sales. Roughly corresponds to a city block in Los Angeles.

The IOUs, we've got, obviously, the three major utilities, but they have a few ski lifts that characterizes utilities. They have CCAs, now, they have direct access.

Given the variety, how do we really capture that going forward? We're assuming the ski lifts or the city

block isn't going to do an IRP, but do CCAs? I mean, what are we really trying to do here? Steve? Peter?

MR. MILLER: Yeah, I think I view a goal as something that's going to be applied broadly. And I guess it goes back to the comment I made earlier about the need for collective action, collaborative action.

If it's simply viewed as a mandate on the utilities, to Jonathan's point, and they aren't given the tools or the resources to get there that's a recipe for failure and not where we think we need to be going.

And similarly, if there are mandates that are applied solely on the utilities, but not with -- not on, for example, CCAs, which we're seeing increasing adoption across the State, we think that's going to leave out an important set of customers.

So, we think it's important that there be broad overall goals. That needs to filter down to specific goals across technologies, across regions. I don't know that we need to have that level of detail in statute. In fact, I'm pretty confident we don't.

But I think in terms of resource plan, in terms of policies that's going to be a necessary part of the effort going forward. We're going to have to look at different sectors. The industrial sector is one that needs increased attention. Small commercial customers,

disadvantaged communities all have specific and differing resource needs, barriers, concerns that will need to be addressed differently, through different programs.

CHAIR WEISENMILLER: Do we need to make some distinction in the requirements, depending upon the size of the entity, in terms of the IRP process?

MR. MILLER: I imagine we probably do.

CHAIR WEISENMILLER: Okay. Does anyone have a sense of how much the existing EE programs are spent in disadvantaged communities at this stage?

MR. CHANGUS: That's going to be a tricky one for some of the POUs, some of the smaller ones primarily serve a disadvantaged community. They're more rural, instead of the urban I think we typically associated with a significant portion.

CHAIR WEISENMILLER: Right.

MR. CHANGUS: And a number of the programs, per legislative direction, are focused on low-income customers. But a specific percentage, I don't have that data.

CHAIR WEISENMILLER: Okay, any sense for the IOUs?

MR. SCHILLER: I suspect somebody in the audience here, so we have a --

CHAIR WEISENMILLER: Oh, they can -- either when the IOUs come on, or written comments are always good.

I think both Peter and Steve, you know, made reference to the notion of trying to do some fine tuning to EMV, away from attribution. Do you want to talk about what do you have in mind for the next generation of EMV?

MR. SCHILLER: How many days do we have here? Let me try to hit the high points. I think the work -- there's several areas in which the work can be done. I think one of the ones that's, to me, is most exciting and interesting gets back to the data question. It is that we have invested in all these smart meters, there's so much data, our tools are so much better. The ways in which we can use the information is so much better.

So, I think one of the great opportunities we're going to be getting, in terms of doing better with our documenting the impacts associated with these projects and programs is through better use of the data. We really can do more of that, now.

There's a more difficult issue which has always been the as-compared-to-what question. You know, what, as the savings, the counter factual. And I think there's a policy issue associated with that, that I think is being addressed in the Legislature.

And I think, you know, we see being addressed every day at the Utilities Commission, when there's a meeting and a discussion about what should have been the baseline over at Joe's Grocery Store?

And I think that these are the kind of things where there needs to be an overall policy decision as to what we're trying to do. And whether it's what we call the gross savings, because the gross savings are what happens, and irrespective of the attribution of the cause.

But we've definitely gotten wrapped around the axle in this State, particularly with the investor-owned utilities, about attribution. And I think it's been a detriment to getting the overall goals.

And so, I think there's both an overall policy issue that can be addressed and, frankly, there is no right answer. I work on this all over the world. There is no right answer to that one because it's a counter factual. But there can be policy decisions that are appropriate for the objectives of the State, or jurisdiction.

And getting down to the micro level, there's the opportunity that we have, really, now, it's really exciting in terms of the technologies, that we can do much better with actual savings determination. But the

baseline is going to be yours.

COMMISSIONER MC ALLISTER: So, I want to just dig in there a little bit. So, it seems to me -- so, I agree with the forest versus the trees issue. As a policy matter, you know, I would love to have a resource at the Energy Commission where we could look, really see where the needle is going. And not necessarily think about it as attributable savings, you know, and divide all that up. Just to see, look, where are we going? Are we meeting our goal? Great.

And in a market transformation kind of context, that makes a lot of sense because, you know, the whole definition of market transformation is that you don't really know what particular thing moved the needle that much, right. It's all together, it's a preponderance, and it moves the marketplace and that's what you want.

But where do our investments go in programs, and how do we know what succeeded? And do we leave it to the implementers to sort of figure that out and, you know, how do we hold them accountable? That's what EM&V purports to do, today. So, what are we replacing that with?

You know, let's say we have this big goal and we are meeting it, how do we know what the next iteration of programs looks like? Because we have to figure out a

way to gauge their success as programs. And whether they're utility programs or whether they're some other kind, local government, or whatever.

So, what does that sort of new regime look like or is it more of what we're doing today?

MR. SCHILLER: Well, I do think we need some new regime here. One approach to this is that the gross savings are what you use for determining the impacts and for accounting. And the net savings, the savings that attributable to the action, you use that for program design. And so, you know, that's one approach.

And so, when we start to look at it, you know, more an evaluation in terms of moving things forward, we can really start looking at the market transformation things and have the kind of efforts that we need to do to get to a transformed market. Whether that's something that's going to roll into codes and standards or into standard practice.

And if we're always just sort of hammering at, you know, what is the savings tomorrow morning and what can we exactly attribute, and use that for the accounting which we give, you know, the credit to the contractors or the utilities, we have this conflict with our overall objectives of transforming the markets. But, really, in getting the savings.

And I'm hoping that by having a long-term target that's every year, this will provide, again, an additional encouragement for everybody involved to say, look, we need to do savings today, but we can't forget that next year we're going to have to do savings, and savings afterwards for transforming it.

So, that evaluation process that's there, again we've got to do something to get out from being wrapped around the axle of what do we credit the utility administrator with tomorrow morning.

COMMISSIONER MC ALLISTER: Yeah, so --

MR. WIKLER: Steve, I'd like to just add a point on the -- I fully agree on the data issue. But it's also timing. So, timing of EM&V studies. It typically is a two- to three-year turnaround time frame. So, by the time the EM&V studies come out, I think actually --

COMMISSIONER MC ALLISTER: Well, IOU programs.

MR. WIKLER: For IOU programs. So, for a potential study, we were updating based on '10 to '12 EM&V results for 2016 and beyond goals. So, that's an example of where if we could figure out ways to accelerate the turnaround time on the EM&V, I think that would be helpful for looking at EM&V as a prospective tool, program design, program redesign. Whereas, what we're dealing with today.

COMMISSIONER MC ALLISTER: Okay.

MR. MILLER: I'll just second that.

COMMISSIONER MC ALLISTER: Thank you. I have a question for Jason, but after you go.

MR. MILLER: Sure. You know, we need to be much more forward looking. Right now, a lot of attribution, it's retrospective, it's kind of a gotcha game. You know, to the extent -- a prime example that comes out is, you know, trying to figure out the savings from the Residential Retrofit Program, where you're calling up homeowners, three years after they participated in the program, and asking them what they would have done in the absence of the program.

And so, you don't get the information until it's too late and you're not getting good information anyway, there's too much uncertainty, and the program's already run. We need to be forward looking instead of backward looking. It's all about moving forward with the best information we have in hand, now. And making a decision that's supported by the evidence, by the best available evidence and going forward with it, and then adjusting as we go forward.

So, I think being forward looking, rather than backward looking is a key aspect of this.

COMMISSIONER MC ALLISTER: Great, thanks.

Thanks, Peter.

Yeah, go ahead.

MR. RECHTSCHAFFEN: Can I ask Greg, or maybe the other panelists, if you could opine quickly about how to do more with the natural gas, since there's such a big gap between market potential and economic potential?

MR. WIKLER: So, I think I pointed out, when I was presenting the results that, what, gas is about a quarter of the economic potential for market potential. Which is are there ways to improve it?

Certainly, the factors that go into that estimate are based on equipment, long life, equipment on the gas side. You have shorter lifetimes on the electric side, so there's more turnover on electric. Less turnover opportunities on the gas.

And the fact that the economics for customers is quite difficult because of the low gas prices.

So, what are ways to improve that? I do think that if there could be more opportunities for retrofits, more opportunities for additional types of measures that might not be included in the mix.

I know I was approached by some developers of a solar thermal unit, or system that is tied to steam injection in oil wells. And they were saying, why can't that measure be included in the potential studies?

So, if there's opportunity to include additional measures that might not -- that policy may not allow to be included right now, that might also turn the needle a bit.

COMMISSIONER MC ALLISTER: We have that next panel, also, that's all about electrification and heating fuels and so, hopefully, will be able to dig into some of that.

I guess, I wanted to ask -- I want to make sure I get my question to Jason. So then, maybe we'll circle back. Also, Jonathan, I wanted to ask you about your EM&V process at the POUs, and sort of compare and contrast, and see if we can elucidate a little bit of need for continuity in the State. But you can be thinking about that.

So, Jason, I guess I had a couple of questions, really. One, you know, sort of what -- so, we're all concerned and we all really want to get deeper, more broader savings in the low-income sector, you know, in disadvantaged communities. And I think, you know, it is hard to reach. There are lots of very diverse marketplace, et cetera.

And so, I guess I'm wondering if you could comment on two things. One, sort of what level of -- what kind of programs would be most likely to get at

those savings? And maybe you could comment on sort of what levels of resources you would think would get the job done?

And then, number two, are there workforce needs? You know, given sort of the weatherization assistance program, and I know you have a variety of programs, but are there challenges in terms of workforce to get to deeper savings that maybe are -- you know, have more technology involved, or that you'd have to sort of put some pieces together and provide some additional services to develop the workforce to do that, do those more deep, comprehensive savings?

MR. WIMBLEY: Sure. So, the first question, in terms of the resources, when you look at the makeup of the disadvantaged communities, oftentimes you have homes that are below code standard. Also, you have multi-family dwellings that are affordable housing, and definitely occupied by low-income individuals.

But focusing more on the single-family, low-income sector, the types of programs that you would need, would be, obviously, there's energy efficiency. And energy efficiency resources are offered generally by the utilities, whether they be public- or investor-owned, as well as CSD. And then, at times, there are local initiatives that might provide some revenues to

support energy efficiency improvements in that type of housing stock.

But in addition, you know, what we do find is a need for housing rehabilitation. And I can give you a couple examples of that. We also are moving forward with leveraging the SASH rebates, you know, to provide, to assist with financing solar system offerings to low-income families.

But one of the huge impediments is structural roofs, you know, and the roofing conditions are so poor that it doesn't permit for the solar installations to occur. And, obviously, replacement of a roof is a pretty heavy investment for the homeowners to carry. And how do you fill the void?

And oftentimes, we're trying to find sources of funding that can cover that type of renovation to a home to allow deeper energy efficiency measures, or renewable energy to take place within the setting.

So as a result, we have to default to, you know, kind of cherry-picking particular homes. And at times we are fortunate and lucky to find homes that are suitable for these types of retrofits. But a lot of times, we have to pass on a lot of homes that definitely could benefit from this investment.

To your other question, on the workforce side,

our programs generally look to recruit individuals from the disadvantaged communities. And our programs, you know, definitely supports and puts heavy investment in building the capacity of our weatherization workforce.

So, certainly, there is a need for additional funding to advance the type of technologies and energy efficiency measures that we currently employ in our program.

Right now, I think there's opportunity in the area of HVAC, for example. You know, that's an area that we feel that there's a great opportunity, but we don't really have the means to provide the training to the workforce to support that type of activity.

And so, we often reach out to workforce training agencies to see if we can form partnerships. But there are times when there's differences in the type of training curriculum that's out there where, you know, you have different variations of certifications and trainings that take place. And we have our brand, but it might not be something that aligns well with the workforce training agency that was looking for something that's more recognized within the industry, or whatnot.

So, I think that's one of the challenges with trying to figure out ways to mesh these resources in a way that provides mutual benefit to all parties.

But to your point, yes, there's definitely a lack of resource in that particular area.

COMMISSIONER MC ALLISTER: Great, thanks very much.

So, finally, I want to -- we have four blue cards, so I want to get to those. So, I'll ask you to be quick, Jonathan.

MR. CHANGUS: Sure.

COMMISSIONER MC ALLISTER: But could you talk a little bit about the POU EM&V process?

MR. CHANGUS: Certainly. I think for public power, focusing kind of on Peter's comments about being more focused on the front. From a customer perspective, making sure we understand what estimated programs or projects are going to save them is critical. So, having something that's defensible, is thoroughly vetted on the evaluation and measurement side, first and foremost, is where we spend a lot of our effort.

We've been working with NRDC, with the IOUs on the California Technical Form as a more transparent, and open, and easier to use document versus the current year process, which is proving increasingly cumbersome.

We undertook, as public power, our own effort to get a technical reference manual that has those clear energy savings up front. And so, I think that's where

we've been focused.

The V, and what we've seen more on report and interactions is more on the regulators to make sure that the programs actually do what they said they were going to do.

And in that essence, I think there's a little bit of a disconnect between how utilities, especially POUs, view EM&V as something that is really more focused on did our program do what it was going to do? What market data did we get? How our customers engaged? It's more than just did we get this amount of savings at this meeting, like we thought we did. That's part of it. But it's much more of a program review that gets you a little more additional information.

And we do that especially on more custom or more emerging programs, the new technologies. And so, we're continuing to look, as you think about behavior programs, as you think about operational programs. We're currently working with SCAPA and CPAS, with the Department of Energy, with the Flex Lab program on the interaction between occupancy sensors, plug load, lighting and how those interact together to figure out what is EM&V. So that we know, not only what the expected savings are from a program, but what do we need to share with the customer about what they need to know

in something that's more than just replacing a bulb.

And as the programs get more complicated, you're going to need to have some of that.

And so, the EM&V process is really, for POUs, not just a verification of the expected savings but, really, how is the program in general working. I think that's a significantly different undertaking that's going to net you results about verified or validated three years afterwards. Ours are usually done the year after. You know, as soon as they close, that next spring we're going to get real-time effort, so that it can inform the next fiscal year's planning process about did we need to change incentives. Was it heavily saturated? Was there not as much participation? Why wasn't there? What do we need to tweak?

It informs real-time program design and development versus externally validating for demand forecasting purposes what was achieved.

Both are important, but we focus more on the customer and program design going forward.

COMMISSIONER MC ALLISTER: So, do you then kind of try to true that up in an IRP kind of context? I mean, it varies, I think, across POUs. But some of the big ones are now moving or are doing IRPs, right? Do you then try to link the programs and the results up to

wherever the needles going?

MR. CHANGUS: Yeah, I think that's an emerging process. I think it definitely informs the next target-setting effort, as well as a number of factors. You know, we're on a four-year basis versus kind of the two-year for the IOUs. But it's definitely something that informs kind of the future program design.

And as we anticipate and set the budgets, additional potential from the E bits then, yes, it does feed back into the resource planning. I don't know if it's as fully fleshed out as an IRB across the board.

COMMISSIONER MC ALLISTER: Okay, thanks.

Do you want to follow up?

CPUC COMMISSIONER PETERMAN: Thank you, that's helpful. And again, I'm still trying to reconcile some of the, perhaps differences, with the approach you take with the IOUs, with what the POUs are doing.

I did just want clarify something, as we move forward, because there was some mention of goal setting, and attribution. And I wanted to clarify that the CPUC sets its goals as gross savings. So that attribution is not done with setting those goals.

Attribution comes up when you look at shareholder incentives for energy efficiency investments, as well as program cost effectiveness.

And then, also, on the issue of kind of the timing when EM&V comes up, I think again we need to -- the Commission, in a couple of areas, has tried to speed up getting some of that information.

And so, for example, to do the shareholder incentives, we have to do an ex-post evaluation within 15 months. Also, the point of rolling portfolios is to try to speed up some of that feedback loop.

And so, I think I'd want to go back to our team and understand, given those changes, you know, which of some of these questions around the lengthy time of the EM&V are still relevant.

And so, I think that's one of my takeaways is there are changes in the works and the question is if parties say, those still don't get there, then that's really what we want to get some feedback on. Thanks.

Oh, also, on the low-income program it was asked how much is spent on low-income communities. I just got a little information from our staff that in terms of the IOU programs, it's around $300,000 a year directly in low-income programs. Sorry, $300 million.

(Laughter)

CPUC COMMISSIONER PETERMAN: Yes, that would be a very small percentage. $300 million is spent directly on low-income programs. And we have low-income

customers who take advantage of some of the other programs, and that might be upwards to about $350 million. That's based on our definition of low-income. That's not the disadvantaged community metric, but we could go back and get that information.

COMMISSIONER MC ALLISTER: Great, thanks.

So, anybody else from the dais? Are we good? Okay.

So, we have four cards. First, Rick Counihan from Nest Labs. Come on up to the dais.

MR. COUNIHAN: Commissioner, I don't have questions for this panel. I just put my card in for later on today.

COMMISSIONER MC ALLISTER: Oh, okay, which panel did you want?

MR. COUNIHAN: I can do it now or --

COMMISSIONER MC ALLISTER: At the end. Sure, why don't you go ahead.

MR. COUNIHAN: Thank you very much, Commissioners. Thank you for having me here today.

The points I was going to make, I thought will be at the public comments section at the end, but I'm happy to do them now. And I appreciate you giving me the opportunity.

I just wanted to point out that many of the

policy goals we're talking about here can be helped by the new generation of thermostats that are available out in the marketplace.

Oh, excuse me, let me introduce myself.

COMMISSIONER MC ALLISTER: Could you identify yourself, yeah.

MR. COUNIHAN: Yes. My name is Rick Counihan. I work for Nest Labs, which has created the Nest thermostat.

But there are other smart thermostat manufacturers out there. And I feel that smart thermostats are a relatively unplucked, low-hanging fruit and is relevant to all of your jurisdictions.

Because as the CEC is going about its updating of the building codes, it's a relevant topic there. The IOU and the POU energy efficiency programs, it's a relevant topic there.

And I actually think what we haven't done -- we've done a fair amount of research and other people have done research on the energy savings of installing these thermostats. And we've seen -- we've got four studies, and I'll submit them later for the record. We've got four studies that show between 10 and 15 percent savings on both heating and cooling.

But they weren't done with -- they were not

stratified by income. And I believe that there is an opportunity here, also, for the low-income programs in the State to benefit from the use of these thermostats. We've have to prove that out, we'd have to test it out.

We, at Nest, are right now trying to run some pilots with weatherization programs in other states. But, you know, if you're looking at putting solar on the roof of low-income housing, putting a smart thermostat is a lot more less expensive, probably can be more broadly sent out there. And it's totally compatible with the other low-income measures that are typically done in, you know, a weatherization situation.

So, my plea is just that you keep this option, technology option in mind. And we will be submitting comments for the record, including the studies that show the savings to date.

COMMISSIONER MC ALLISTER: Great. Rick, are you playing in the -- or looking to play in the demand response market, in terms of aggregating customers who have your product and bidding those into the market, should it exist?

MR. COUNIHAN: So, our thermostat has the capability of providing demand response. To date, we've mostly been working with our utility partners on that and not been doing that directly.

COMMISSIONER MC ALLISTER: Okay, thanks. Next card -- thank you for being here, appreciate it.

Melanie Gillette, from EnerNOC

MS. GILLETTE: Thank you. It's nice to see all of you today, and I appreciate the opportunity to make some brief comments. Melanie Gillette, with EnerNOC.

We've been primarily focused in California on the demand response side, but in the last couple of years we've developed some strong offerings on the energy efficiency side, as a lot of you know.

And I'll try and keep my comments very brief and submit the bulk of my comments in written comments. I know we're running a bit behind time.

I just wanted to thank all of you for the work that California has already done in this area, both privately and through utility programs.

But as has been acknowledged by many of you, most of you today, there's more to do to meet these ambitious goals of our Governor.

In the draft action plan, we would just like to encourage more active development of commercial energy benchmarking across the State. I know that there's a placeholder for benchmarking. Want to make sure that commercial benchmarking is included.

And we do see that the main growth areas for

energy efficiency are customers who have been overlooked by past approaches. One of the groups that we're focusing on, and the PUC has focused on this as well, is the small and medium business customers.

The new goals encourage the State to explore innovative program areas. We would like to see behavioral energy efficiency, as Commissioner McAllister's indicated, and several of the panelists have also discussed, for business customers. We know that that is a strategy in the draft plan, we'd just like to make sure it includes business customers.

In the realm of behavioral efficiency, there are wide scale programs that have been deployed in other territories that use business benchmarking, energy analytics, and low or no cost operational recommendations. We'd like to include those in our public comments, and in our written comments, and also talk to you about those at a later time.

We also think that there's an opportunity to include behavioral demand response in order to build on the investments the State's made in AMI.

One of the last comments I'll make here is that we haven't heard a lot, at least I don't think we've heard a lot today about the Senate Committee is considering AB793. But we think that that is a really

positive direction because it advances a lot of the draft plan's goals by encouraging energy management technologies across homes and smaller businesses. So, we're supportive of that.

And I'll save the rest of my comments for written. Thanks for the opportunity.

COMMISSIONER MC ALLISTER: Thanks for being here, appreciate it.

The next card, Lisa Schmidt, from HEA.

MS. SCHMIDT: Good morning, barely. My name's Lisa Schmidt. I'm President of HEA. And we're a software startup in Silicon Valley.

We founded our company on the belief that you could take smart meter data, glean some useful information out of it, help people save energy, and then track those energy savings.

We've come to realize, after analyzing about 4,000 homes in Northern California, through community EE programs, that a real benefit to the entire industry would be able to set up a standard, hopefully administrated by the CEC, to verify those savings using smart meter data.

And this would give us four immediate benefits, we believe. You'd be able to adopt technologies quicker because you could measure how much energy they save

based on standards through AMI data. You'd be able to have much more accurate analysis of energy savings because you can compare it to baselines. You'd be much less expensive MME and, hopefully, be able to accomplish it must faster. And, finally, it would open up EE programs to all residents.

So, if you can measure the savings via the smart meter, as opposed to attribution, or past surveys, you'll be able to have people in multi-family houses, people in rental houses. You'll be able to target the EE savings to them that's very, very specific.

We have some visions on how to do this. I'm sure other people have some visions on how to do this. But we really believe this would open up the market to a lot of new EE opportunities. And it's something that we believe the CEC has the power to do and we would like to contribute. Thank you.

COMMISSIONER MC ALLISTER: Thanks very much.

Kevin Messner, from AHAM.

MR. MESSNER: All right, thank you. And if you have some other cards --

COMMISSIONER MC ALLISTER: I have one more card, actually, that just came in.

MR. MESSNER: I'm happy at this time to let them go first, because I have some comments that are directly

specific to the PUCs, so maybe she'll be back. If not, I'll go ahead and save them, if that's okay.

COMMISSIONER MC ALLISTER: You know, I'm not sure. I think she was asking folks not to get too specific about things that are on the docket today.

MR. MESSNER: It's not on the docket. But I can do them now, if you want.

COMMISSIONER MC ALLISTER: You know, let's let the last speaker come up.

MR. MESSNER: Okay.

COMMISSIONER MC ALLISTER: Anna Solorio, from the Efficiency Council.

MS. SOLORIO: Good afternoon. Anna Solorio from the Energy Efficiency Council. Not to be confused with Steve's group.

COMMISSIONER MC ALLISTER: Oh, okay.

MS. SOLORIO: We're low income. Represent contractors, subcontractors that implement the energy savings assistance program, and other low-income direct install and moderate-income direct install.

I just want to mention that last year our network, plus serviced 300,000 low-income families. That's 300,000.

I want to -- that's a deep reach into the low-income energy efficiency potential.

I want to reiterate and just thank Steve and Jason for some of their comments because they're spot on in terms of low income. And some of the challenges and, I think, opportunities maybe we can consider to increase the penetration in energy efficiency. Excuse me, I'm really nervous.

COMMISSIONER MC ALLISTER: Don't, you're --

MS. SOLORIO: You guys are an awesome -- you're an impressive group, so I'm not used to speaking in front of you.

Just I just want to mention that because of the reach we have, there's a large potential for us to do deeper energy education and that is focusing on changing behavior of the family. And we can do that because we hire people that are culturally sensitive, come from those groups, speak the language. And in California, there's a multitude of languages, especially in the low-income community. So, we see great potential increasing behavioral change at that level.

And also would like to support using better technology, newer technology. Appropriate data we can gather from that home and use that to customize what we install. So, I'd like to support that.

And also, Jason measured, I think if you're trying to reach these targets and goals, I would

emphasize not to ignore the NEBs, the traditional non-energy benefits. Because cost effectiveness can be a dual-edged sword, if it's not cost-effective to repair a window that has holes in it. So, changing out your HVAC is not going to reach what I think makes common sense goals.

So, I think you have to be really aware of t hose non-energy benefits or, more specifically, cost effectiveness. Because if you can look at large target goals and give flexibility to reach those goals, I think you service the community. I think you service low-income community. And I think you can also reach your energy efficiency targets.

The last thing I'd like to say that if you're looking at a market transformation, you really need to focus on some workforce development. And I second the HVAC training. Because we'd love to be able to go in and treat homes and upgrade the HVAC system, which is a leaky HVAC, or vents, or a major -- a lost opportunity.

So, thank you very much for my comments. And I'd like to offer our association as an opportunity, if you have any questions regarding servicing the low-income communities. Thank you.

COMMISSIONER MC ALLISTER: Thanks very much. I'd encourage you to put in your comments into the

record, written comments, that would be great. Thank you very much.

Okay, last -- we're only a couple minutes late here, so last speaker, Kevin Messner.

MR. MESSNER: Thank you, Commissioner McAllister. I'm Kevin Messner. I represent the Association of Home Appliance Manufacturers.

So, I just want to start off, CEC, I feel, with the appliance industry has been done -- has an interest and desire on energy efficiency and I feel like we have a seat at the table.

So, my comments, though, are directly mostly to PUC and the Governor's office, because I think this is a great panel, because it all needs to be working together.

The thing that's important, I think, to realize is that a lot of these assumptions may be that the current efficiency programs are going to continue as they are. And the PUC takes action, and I'm just going to be frank, and I know we're out of time, takes actions that actually block and hurt efficiency programs.

So, just that really needs -- these barriers need to be reduced. We've joined up with NRDC and retailers on the bills the last two sessions, to try to mandate that the PUC does these types of things to

reduce the barriers.

Two quick examples. DR, the useful life of that refrigerator is 11 years, 12 years. That boggles my mind where that number comes from. We've talked about this for two years and no changes have happened.

Recently, come up with a disposal appliance refrigerator process that basically will kill the disposal efficiency rebate programs, which are just all over the country. Highly effective and very well adapting on energy efficiency.

So, this ex ante reviews, DMV we've talked about. So complicated. I wonder how many dollars are spent on EM&V where -- and is that kind of complicated analysis needed to get to three, four, or however significant digits are needed to actually get to an answer.

So, I'd really like to look at trying to simplify EM&V, use that money towards, actually, efficiency programs. And not have it set up as a barrier to efficiency programs.

Data. Data is a great thing. Appliance industry is here to help. We worked with CEC, their database modernization there, doing really good things, we think on this.

PUC, useful life, the disposal program, where no

one uses a ten-year refrigerator afterwards. I have no idea where that came from. We have data that exists all over. Love to work with you on that.

And last, but not least, below savings codes, below code savings. There's a lot of areas that could be worked on today. A lot of the low-hanging fruit, of the low-hanging fruit is to get the barriers removed that exist today.

And the appliance industry is willing and anxious to work. We'd love to have the Governor's leadership and PUC's leadership. CEC, I think, does have -- is doing a lot, too.

So, those are my comments and, hopefully quick. I still have 25 seconds left, but I'll finish.

COMMISSIONER MC ALLISTER: Thanks. Yeah, we didn't plant that, by the way.

(Laughter)

MR. MESSNER: Well, Commissioner McAllister usually does not -- usually do not have a lot of good things but today, yeah, it looks like --

COMMISSIONER MC ALLISTER: I appreciate that.

MR. MESSNER: I was going to say we have a seat at the table, but it's usually the high chair in the corner. But I left that outside, you know.

COMMISSIONER MC ALLISTER: Yeah, well, thanks.

Let's see, so I guess I probably didn't say it at the beginning. You know, I was kind of hoping and maybe assuming that the comments would have to do with the particular topics we were talking about, the panel we were just having.

Like to-code, for example, is the first panel in the afternoon and we'll be digging into that. So, hopefully, those of you that have views about that will stick around and comment then.

So, I don't want to short change the second panel of the morning. That was kind of, I think, the biggest one, perhaps the meatiest one of the day, but certainly of the morning.

So, yes, so anyway, well, thanks for all of you here who are going to submit the written comments. I know they're going to be thoughtful and extensive.

So, let's move on to the next panel. I think under-appreciated is the fact that the Governor's third goal also specifies cleaning up our heating fuels.

And there are really two primary aspects of that. One is really figuring out how to improve the carbon profile of our natural gas, biogas, for example.

And the second, sort of flip side of that is what the electrification potential for heating actually looks like.

MS. EDSEN: Commissioner McAllister, I need to apologize. I need to step away and return to by office. But Tom Doughty's here, the Director of the Regulatory Affairs for the ISO. If you don't mind --

COMMISSIONER MC ALLISTER: Absolutely. Tom, come on up, yes. Thanks for being here in the morning, Karen, we really appreciate it.

So, smaller panel this time, all right. Peter's up again. Don't repeat yourself.

And we'll get going. Let's see, who's first?

MS. RAITT: Obadiah Bartholomy is first.

COMMISSIONER MC ALLISTER: Thanks, Obadiah.

MS. RAITT: Go ahead.

MR. BARTHOLOMY: Okay, do you want to me to go ahead and present from this view?

MS. RAITT: Either way.

MR. BARTHOLOMY: Okay. Well, thank you for the opportunity to come and speak to you all today. I really appreciate it. My name is Obadiah Bartholomy. I'm with the Sacramento Municipal Utility District.

And I'm going to be sharing with you some of the analysis we've been doing, looking at the opportunity for electrification of natural gas end uses in buildings, from a carbon reduction perspective.

So, the next slide. So, we started getting

interested in this within SMUD's Climate Change Program in 2011, with the publication of the CCST study, California's Energy Future, the View to 2050. And that analysis was looking at all of the things that we would need to do as a State to get to the 80 percent below 1990 level carbon reductions.

And I know the Energy Commission and some of the other State agencies were involved in that study.

One of the things that struck us in that was that it said that to get to those targets we would need to not only de-carbonize the electricity system, but also achieve about 70 percent electrification of building natural gas heating and water heating end use electrification.

More recently, the E3 Pathways analysis has come at that a little bit differently. But looking at it in 2030, assuming biomass being used for liquid transportation fuels, they stated that over 50 percent of new sales of space conditioning and water heating are electric in 2030, on their straight line scenario.

That was one of a couple of different scenarios and one of their forks in the road as to whether you put that biomass into natural gas or into transportation fuels.

The next slide. Based on that analysis and

looking out into the future, we did some work to look at whether there was actually a carbon reduction opportunity today, based on the efficiency of the technology. And if not, kind of when that would come about based on de-carbonization of the electric sector.

And what we found was that, indeed, for the heat pump water heater technology area, and also heat pumps for space heating, that there's actually nearly a 50 percent carbon reduction in carbon today, based on their current efficiency.

And we're actually, now, seeing devices coming to market that are achieving a coefficient of performance of four, versus the three that's shown in the chart here. So, achieving even greater carbon reductions that are shown here.

This accounts for today's marginal grid mix and our marginal RPS --

CHAIR WEISENMILLER: Yeah, so you're basically assuming that 25 percent of the time natural gas is not on the margin? Or what percentage of the time for the SMUD system do you assume natural gas is on the margin?

MR. BARTHOLOMY: So, this would assume that each kilowatt hour that we sold to someone who had electrified an end use, we would have to procure an additional 25 percent renewable. So, it might not

coincide hour-for-hour with the natural gas end use.

CHAIR WEISENMILLER: Okay, but just generally you're assuming about 25 percent renewable on the margin right now?

MR. BARTHOLOMY: The RPS requirement, again, is a requirement on our annual retail sale.

CHAIR WEISENMILLER: Right, it's load -- it's resources, not marginal, right?

MR. BARTHOLOMY: Right.

CHAIR WEISENMILLER: Okay, but you're assuming -- fine.

COMMISSIONER MC ALLISTER: Bundled resource, right?

MR. BARTHOLOMY: What's that?

COMMISSIONER MC ALLISTER: You're comparing bundled kilowatt hours?

MR. BARTHOLOMY: Yeah.

COMMISSIONER MC ALLISTER: Yeah, okay.

MR. BARTHOLOMY: So, looking forward, in 2020 we would have a 33 percent RPS requirement. In 2030, We're looking at maybe a 50 percent RPS requirement. So, improving on that carbon reduction as we go forward in time, both from the grid mix and from the technology efficiency.

The next slide. And sorry, that last slide was

comparing to a very efficient, on-demand gas water heater.

COMMISSIONER MC ALLISTER: Obadiah, could you talk about sort of where -- sort of the cost effectiveness issues here? Because, you know, we heard from Greg earlier that part of the battle here is that gas is cheap. So, maybe under what scenarios would the cost effectiveness kind of lines cross in a way that's helpful for policy. Maybe I just led you into your next slide.

MR. BARTHOLOMY: Yeah, that's my slide. If you can imagine up there a very complicated chart that talks about cost effectiveness. I'm not sure if you all happen to have printouts of these, but for some reason --

MS. RAITT: Yeah, I'm sorry. I'm not sure what the problem is.

MR. BARTHOLOMY: It's not showing up on the screen.

MS. RAITT: But people do have hardcopies.

MR. BARTHOLOMY: So, this chart is answering your question on whether or not these are cost effective. And this chart was looking at comparing a heat pump water heater with an assumed $1,000 premium for installation over a natural gas tank-based water

heater, which is about what we've seen in our heat pump water heater program that we've been deploying for our electric customers.

And so, this assumes payoff of that heat pump water heater premium over a 13-year period, which was the assumed lifetime of the technology.

And we looked at four different scenarios of gas prices, ranging from 75 cents a therm to $1.50 a therm. For reference, my own residential gas prices range from $1.00 to $1.20 a therm over the last several years.

So, today's heat pump water heater efficiencies are in the range of between two and a half and four, in terms of a coefficient of performance. So, that's a gray bend on your black and white printouts.

And it just shows that depending on what your electricity price per kilowatt hour is, within those dollar to dollar twenty-five per therm range that you do have cost effectiveness below ten cents a kilowatt hours for the dollar a therm, and below 14 cents a kilowatt for the $1.25 a therm.

And if gas prices increase to $1.50 a therm, we would expect cost effectiveness out beyond that 14 cents a therm -- or 14 cents a kilowatt hour, excuse me.

The next slide. So, based on our analysis showing that it saved carbon today and would increase

the amount of carbon saved in the future, and that it appeared to be cost effective based on our current rates in Sacramento, and especially based on time of use rates that are coming, we worked with ICF to look at turnover rates, to see when would we need to go about starting to try and drive this electrification, if we wanted to achieve the goals that were called for in the California Energy Future Study. And really found that we actually need to start quite soon, based on stock turnover rates, in order to get adoption of this technology to the penetration levels called for. So, within the next five years.

The last slide. So, some of the barriers to deployment. I mentioned the rate structure. So, the tiered rate structure is very harmful for thinking about electrification at all. You really want to be under some kind of a time of use or, ideally, a real-time pricing structure. Especially, as we're seeing solar prices continue to fall. An article, the other day, saying First Solar says they'll be under a buck a watt for tracking systems all fully installed, with no ITC.

That's going to drive very aggressive adoption of solar and very low daytime costs for power. And these are a technology that has built in storage within them. They're about one-third to one-half of the load

of an electric vehicle. So, not an insubstantial load. But we really need a rate structure that reflects that.

We also have a Title 24 and TDV preference for natural gas that needs to be examined and, really, the flexibility that's inherent in these technologies needs to be acknowledged and valued within that framework for this to be something that could make sense in building codes.

Also, the embedded rate structures within the TDV calculations are something that would need to also reflect either a time of use or a real-time pricing type of rate structure for this to make sense.

Lastly, the higher upfront cost means that we probably need some kind of an incentive or rebate to get people to install these, or else be installing these in new construction. And that really requires and efficiency framework that values this outcome, values carbon reduction, values flexible loads.

So, really, if we had some kind of an energy efficiency goal or standard that was focused around a certain amount of carbon reduction as being an objective, that would create a lot better alignment towards getting this kind of activity to become a more prevalent structure of compliance.

Thank you.

COMMISSIONER MC ALLISTER: Thank you.

Let's see, who do we have next?

MS. RAITT: Next is Allison Smith.

COMMISSIONER MC ALLISTER: There we go, awesome. Go ahead.

MS. SMITH: Thank you for inviting me here, today, to speak on behalf of SoCalGas.

SoCalGas has been looking at what role natural gas can play in California's long-term energy mix, given the focus on low carbon targets for 2050. Ninety percent of the homes in our service territory use natural gas for space and water heating, and it's because of the efficiency of the equipment, as well as the cost comparison, as we've heard other speakers talk about earlier.

We engaged E3 to do a study on what role can natural gas play that sort of built off of their earlier work that was published in the 2012 *Science Magazine* article.

And we asked them to look at if we looked at an opportunity to de-carbonize the pipeline, what could that mean for reaching the goal?

And they found that there were pathways that you could use this de-carbonized natural gas, similar to de-carbonizing electricity, that can get you to the 2050

target.

Some of the key findings were that when you do this sort of integrated mix, where you do have heavy electrification, especially in passenger electric vehicles, and in some other areas where it makes sense to electrify, and then use lower carbon heating fuels, and low carbon transportation fuels that you really can achieve the climate change goals.

And you can get reductions in sectors that are very challenging from an electrification stand point. For example, we know that there's a lot of progress that's been made in the small electric vehicles, in passenger vehicles. But in the heavy duty sector natural gas, using renewable natural gas as the fuel source actually provides a great opportunity to get to the heavy duty sector.

In existing homes, where as I mentioned, there's a substantial number of homes that are natural gas for heating fuels, it makes a lot of sense to pursue renewable natural gas and low carbon gas in those areas, rather than looking at the cost of replacing and retrofitting homes that aren't built for that electric load.

So, there's a balance of places where this low carbon natural gas makes a lot of sense. And working

with the electrification of other areas makes sense as an integrated solution to get to the 2050 target.

We also found, and I'm not going to spend a lot of time talking about this, but that power to gas creates another interesting opportunity to integrate the natural gas and the electric grids. Where you would take the excess renewable electricity and convert it into useful low carbon gas, either hydrogen or a methane, and then we can store that in our pipeline, use it for residential, and commercial, and industrial applications. Or, use it to generate electricity at times when demand is higher. So, it's another benefit to using this approach of low carbon gas, and de-carbonized electricity. It really can make sense for California long term.

In the E3 study -- one of the questions you asked was about what are the sources of the potential source of renewable natural gas supply?

And in the E3 study, they focused primarily on the 2011 DOE billon-ton study to look at what resources were available. And they found that in California we have a certain amount of organic waste that would be available.

But if you look nationally at what's in the DOE study, and you look at us using a proportional amount of

those resources based on population of California compared to the U.S., that there would be sufficient resources to meet this low carbon scenario.

And it was roughly 20 percent from organic waste streams and another 20 percent from energy crops, purpose-grown crops, like switch grass.

When we looked at the -- this original E3 study was looking at how do we meet that 2050 target and it just used a straight line approach.

And so, by 2030, we'd be at about 34 percent renewable natural gas under that study, looking at available sources and the need to drive to the GHG targets.

We'd hit 40 percent, which is the Governor's new goal for 2030, in the 2032 to 2033 time frame. So, what we're trying to look at right now is what strategies we'd need to pursue to accelerate and achieve the 40 percent reduction by 2030. Just as you're looking at, it will be more accelerated energy efficiency, faster or deeper turnover of the transportation sector to renewable fuels. And as well as accelerating opportunities for biogas.

When we accelerate those opportunities for biogas, we are looking at possibly more expensive sources of gas, looking at some of the gasification

options. And so, we're trying to balance what is the cost with the availability of that supply?

We have looked at other resources, and I'll share some information in written comments, for you, on other studies. The Bioenergy Association of California had done a study or actually used a study by UC Davis that identified the potential for California-based resources for renewable natural gas.

But there was also a National Petroleum Council Study and an American Gas Foundation Study that looked at the potential for national production of biogas for the transportation sector in the case of the NPC study and, more broadly, in the AGS Study for End Use Applications.

And so, I'll provide you some information from those studies that we can submit for the record.

When we looked at the questions you asked about is there an economic advantage for using biogas in buildings versus transportation, today there are market structures in place that incent the use of biomass and biogas for transportation and for renewable power generation.

The RPS provides the benefiting of having -- producers can sign long-term contracts that give them more market certainty, so that they can develop their

projects.

On the transportation side, you have the Federal Renewable Fuel Standard, and you have the California Low Carbon Fuel Standard, both of which create a market.

Unfortunately, they're still kind of short-term markets. The LCFS doesn't have as long a history and there's still some uncertainty on what those prices are going to be. So, in terms of developing the market, it's still at a very early stage for those to create sufficient market incentives for it to be a very deep market.

But we have seen on the LCFS that in 2014, 20 percent of the transportation fuel for natural gas vehicles came from renewable natural gas. And in the last quarter, we understand that that's ramped up even more.

So, as the LCFS market develops, it is going to create a signal to use the renewable natural gas in the transportation sector.

But we think that longer term you need to look at where's the best balance of resources.

In the E3 study we found, as I mentioned before, that transportation is certainly an opportunity, but then there's also certain industrial processes that require high heat, processes that really require natural

gas combustion. And so, using the renewable natural gas in those sectors make a lot of sense. But also, using it in the existing homes and commercial buildings, where there's already deep penetration of natural gas, makes a lot of sense there.

We need to do some more work on evaluating that tradeoff, especially as we accelerate the time frame for the GHG reductions. But it does make sense to consider what role that renewable natural gas can play in terms of the economic benefits.

I did want to make a comment on electrification. There's an assumption that electrification will definitely mean greenhouse gas reductions. And what we've looked at, it really does depend on what technology you're comparing.

When you compare the current technologies for water heaters, the tank water heaters, if you move to an electric water heater, compared to the natural gas water heater, you'd actually increase greenhouse gas emissions until you reach about 50 percent renewables in your electricity mix. And that's comparing fossil natural gas to 15 percent renewable electricity.

So, when we look at where's that tradeoff, we need to consider, as you move to more renewable natural gas, that will actually make that transition point

different. It will need even more renewable electricity.

So, the automatic assumption that electrification means a reduction in greenhouse gas emissions is false and we really need to examine it more on those technologies.

The other area with the residential that I'd like to comment on, is on ZNE. We had looked at -- for new homes, we had asked Navigant to do a study for us that looked at the cost comparison under TDB for a home that was mixed use, natural gas and electricity, and full electrification.

And in those scenarios, the energy use in a home that's all electric is actually higher than natural gas, because the natural gas equipment is more efficient.

And so, the size of the PV that would be required is quite a bit higher on the electric than with the natural gas included. And so, that can also lead to cost implications for builders and for consumers. And so, we think having a mixed use home, with natural gas, actually can be beneficial in the long run, in ZNE.

In addition, with the PV on rooftops, there are limitations to where that can be placed. And so, when we start looking at community generation, we also think that natural gas can have a role in community

generation. Looking at using a mix of renewable and fossil natural gas can help achieve those ZNE targets on a community generation basis, as well.

COMMISSIONER MC ALLISTER: Thanks very much.

So, accumulating questions, but we're going to hold off until after Peter. Go ahead.

MR. MILLER: Thank you very much. And I'll be brief so we can move on to the questions and the conversation. And it's unfortunate Amber Mahone wasn't able to join. They've done some really great analysis that really focuses on the long-term imperative of in order to meet our long-term environmental goals, the climate targets at 80 percent reductions by 2050, we really have to move over that time period to very low carbon energy use in buildings.

And that will require either renewable natural gas, zero carbon natural gas, or electrification. And renewable natural gas, while there clearly are opportunities there, it's going to be either limited in supply, on the biomass side, or relatively high cost on the electricity gas side.

So, we think that over the longer term there will be a need and a big environmental benefit from shifting natural gas uses in buildings to electricity.

End uses are water heating, space heating,

clothes drying, pool heating and cooking, all of which have electrification opportunities.

Now, in the near term, the environmental benefit depends on the efficiency of the device and on the carbon intensity electricity.

So, as was pointed out earlier, we have some -- all of our utilities are relatively, compared to the rest of the country, low carbon. But some are more low carbon than others. So, PG&E, which is about 25 percent renewable, now, also has a substantial fraction of nuclear and hydro power on its system, both of which are zero carbon.

And so, and you compare a very low carbon utility system, now. In some cases, those electrification opportunities already provide a carbon benefit. And over time, as the percentage of renewables increases on all the utilities in the State, that will increasingly be the case.

So, what does that mean in terms of policy going forward today? It means we want to start earlier for longer-lived devices. We want to get to a 2030 target and a device has a 15-year lifetime, that means that we'll want to start installing those devices over the near term, over the next five years because those are the devices that are going to be in place and operating

in 2030.

For shorter-lived technologies, water heater, a clothes dryer versus a space heater, or a furnace, we have a little bit longer to go before we really want to start implementing those in order to reach a 2030 target.

We also -- the cost effectiveness is going to improve over time as technologies get better and lower cost. So, we can start earlier on the cost effectiveness technologies, the ones that are cost effective today.

It certainly means that we need to start planning, looking at programs and policies that can get us to 2030.

And then, finally, we certainly -- well, the CEC's got the premier clean energy RD&D program in the country -- the state level RD&D program in the country, and I think that's an important area to really be focusing on, now, for electrification because there's a lot of opportunities that aren't yet commercially available, but could be given some investment.

And with that, I'll end my comments and feel free to join in the conversation.

COMMISSIONER MC ALLISTER: Thanks, Peter.

Go ahead.

CHAIR WEISENMILLER: Yeah, actually, first, I need to correct you. So, PG&E, you really have to look at what's the marginal fuel. And PG&E, on the margin natural gas is about 75 percent of the time, even though it's resource mix, it might be 75 percent non-gas.

Again, you stack up hydro and nuclear baseload. So, it's not like you -- if you have another 100 megawatts, you're not going to get more hydro, you're not going to get more nuclear, you're not going to get more renewables, except in over-gen. But you're going to get it with natural gas.

So, ultimately, on the end use now, today, this is not saying later, today once you go through the primary energy use side of stuff, you know, you can either burn, say, natural gas in a power plant, you know, with that 40 percent efficiency, and then ship it out on a transmission line, and then send it to an electric heater, space heater, electric water heater, which is pretty dismal, or you can use it in your house.

And so, that isn't to say over time we're not going to have to shift to all electric. But I'm just saying as of today, no, you're going to have more greenhouse gas emissions if you do it today.

Now, having said that, we have to deal with -- certainly, one of the things E3 flagged is not only the

need to do electric space and water heater over the longer term, but to really confront, now, the issues on commercialization of heat pumps.

You know, that certainly, in Art Rosenfeld room, I mean we got rid of electric space and water heating, you know, in the 1970s for good reason. And again, I think Art would certainly echo that.

So, it's really, we really need the efficiency of the modern heat pumps, you know. And so the commercialization there, and that was deemed -- if you look at E3's high risk table, one of the risks is commercialization.

So, we have to be -- that's what we really have to do in the next five years is to work through the commercialization so that, particularly, in areas like the South Coast, where we're going to need pretty dramatically in the post-2020 period to space and water -- you know, one way or another to go to post-combustion down there.

Again, we need to be setting up that, you know, moving that out at this stage. But like I said, if you just, tomorrow we replaced every gas water heater in the State with electric, I know the resistance would be horrific. But, you know, if basically we could do it with heat pumps, that would be good. But we have to

make sure the technology's going to be there when we really need it.

So, certainly, the SMUD commercialization stuff on that is very important.

MR. MILLER: Yeah.

CHAIR WEISENMILLER: You know, we need to be doing that. At least some of the stories I hear from other places is that there are certainly performance -- reliability issues, I guess is a better way of phrasing it, for some of the heat pumps.

What's your experience been on that?

MR. BARTHOLOMY: Yeah, so I think the prior generation of heat pumps that we saw in the 80s and 90s, there have been several failed attempts at commercializing really reliable technologies that customers liked, in particular relative to space heating.

But I think what we've seen from the newer generation of technologies, are technologies that operate much more efficiently.

GE is coming out, right now, with a unit that's got a COP of 2.9, so three times the efficiency of air resistance heat pump.

We have available heat pumps for space heating that are already at COPs of 3, even a COP of 4, with

variable speed technologies within them.

So, I think the efficiencies are there. I think in terms of the reliability, this current generation that we're working to commercialize right now is relatively new. So, these units have only been on the market for the last three or four years. So, there's perhaps some question about what their long-term reliability will be over their life and whether they will achieve the 13-year life that they're rated for.

But I think they're a much different generation of heat pumps than we've had from 30 years ago. And there are a lot of manufacturers working very hard on this within the U.S., and a lot of European and Japanese manufacturers who have been working on this for quite a number of years to improve the reliability of these devices.

CHAIR WEISENMILLER: Well, certainly, the more SMUD can do in terms of that sort of testing, roll out and ensure the customers that reliability issues will be dealt with. You know, it's really important at this stage, as part of that transition of a longer term.

MR. BARTHOLOMY: I do want to clarify, though, when you're talking about the carbon reduction question, I think with the efficiencies we're seeing for commercial units today, there is carbon reduction, as

the analysis that I presented showed.

CHAIR WEISENMILLER: Right.

MR. BARTHOLOMY: If you want to talk about resistance units, that would fundamentally limited to 100 percent efficiency as their threshold, yeah, I would agree with you that you would need something more than 50 percent renewables on your margin to be able to be a carbon-saving technology.

So, my analysis was really on the more efficient generation of heat pumps that we're incentivizing our electric customers to take advantage of today.

CHAIR WEISENMILLER: Yeah. No, that was interesting, particularly if it is -- if 25 percent renewables are on the margin or 25 percent of -- if gas is 75 percent, you know, if that COP makes it work, then that's certainly a pretty interesting number and you get back to reliability and economics.

COMMISSIONER MC ALLISTER: Yeah, so I wondered, actually along those lines, I mean so we're talking about -- you mentioned TOU rates sort of being critical for making the cost effectiveness work. But that also means that the reason those rates are high is that, you know, we're in the middle of the afternoon, and when everybody wants to use their AC.

And so, I guess I just kind of wonder how you --

sort of the demand response capability question and are you kind of, you know, working on different technologies to try to avoid the load issues?

MR. BARTHOLOMY: Yeah, I mean, from an air conditioning perspective the technology's the same. We basically -- a heat pump is basically taking that air conditioner piece and making it use -- work during the winter as a heater, by reversing the flow.

So, it would have the same demand response questions and time of use responsiveness questions that a normal HVAC program would have. And we're absolutely working to encourage the use of smart thermostats and encourage connecting customer data to outcomes with our rate structures that we're proposing to roll out here, in the next couple of years, moving to a time-of-use structure that will encourage off-peak usage. And working with customers to make their building shells as efficient as possible, to make as much of that demand shifting feasible.

COMMISSIONER MC ALLISTER: Right, so the more you can integrate all of that, the better, obviously.

I guess, so it sounds like you're planning to rely on rates, per se, sort of time-of-use rates to sort of send that right signal.

But are you also looking at, you know, direct

control and sort of more aggressive load control like that?

MR. BARTHOLOMY: We do have a variety of demand response programs with varying levels of controllability that we're piloting this summer. And we have some from commercial that differ from the residential, and we're evaluating customer opt-out from the signal, from the utility, and how many opt-outs for what incentive level, and how many degrees of setback customers are willing to accept.

So, that's an open question right now. Our preference is to have the customers have the choice to be as comfortable as possible, and make a choice based on the economic signals that they're getting. But we also have to make that a reliable resource for us on the supply side.

COMMISSIONER MC ALLISTER: Yeah, because I want to kind of link up the ISO with that conversation, too. You know, when they push the button or somebody pushes the button, you know, and SMUD pushes the button, what do you have to offer to the system, and getting those numbers right I think is really, really important. And they're really looking forward to all the production of those efforts. It's super, super important.

Did you want to -- Tom, do you want to --

MR. DOUGHTY: On another front. Allison, you talked about the fuel cell vehicle opportunity. The ISO's run some numbers that indicate how many megawatts of over-generated power could go into electric vehicles. Let's put fuel cells aside for a minute.

For every 1,000 megawatts of over-generated electricity, we think we could power between 300,000 and 600,000 battery powered electric vehicles.

Okay, so 1,000 megawatts, 300,000 to 600,000 EVs.

Now, some of you have probably seen that we may have as much as 10,000 megawatts of over-generated energy in the coming ten years. So, you can kind of do the math there and see how many electric vehicles that could represent.

My question for you is, as you take a look at hydrogen production, and assuming that the hydrogen fuel cell vehicle can get legs and get moving, have you done any analysis on the megawatt consumption for a similar amount of hydrogen production to get that fuel off the ground and running?

MS. SMITH: So, when I was talking about opportunity for power to gas and hydrogen production, I was actually looking more at using that fuel source -- or using that fuel and putting it into the pipeline, and

delivering it. So, it could be used for a transportation fuel, it could be used for power generation, or it could be used in the home.

So, and the E3 study, I apologize, I don't have it off the top of my head, what amount of power to gas we had assumed had gone into the pipeline. But I can certainly get that information for you.

MR. DOUGHTY: We're preparing for our annual stakeholder symposium at the ISO and may of the folks on the dais are joining us. We're actually going to have a SoCalGas representative talking about the potential for using this power to gas model, and putting it back into the pipeline as a fuel, but also catalyzing the launch of the hydrogen fuel cell market.

MS. SMITH: I assume it's Jeffrey that's --

MR. DOUGHTY: Yes, it is.

MS. SMITH: Yes.

MR. DOUGHTY: Thank you for that.

COMMISSIONER MC ALLISTER: Allison, could you give us a sense of what sort of infrastructure investment you would be looking at making to ramp up to the 20 percent or 40 percent biogas sources?

MS. SMITH: Well, from the utility's perspective --

COMMISSIONER MC ALLISTER: The utility

perspective, yeah.

MS. SMITH: I would really be in the interconnect costs and any kind of gathering systems that would be needed. So, for example, in the dairy industry, you would want to collect, and gather, and bring it in.

So, we don't have a study on that. That's something that we need to look at to see what kind of incentives we're going to need to help support the development of that market.

So, it's something that it's really more work in progress to figure that out.

COMMISSIONER MC ALLISTER: Okay, that seems pretty important to figure that out.

MS. SMITH: Absolutely.

COMMISSIONER MC ALLISTER: So, you know, then compare that to sort of what we would need to do in the electric system to accommodate those additional loads as well, and kind of compare and contrast.

MS. SMITH: Yeah, I wanted to make one comment, when we were discussing electrification of heating load, in particular, and the discussion from Commissioner Weisenmiller on, you know, the natural gas being on the margin and the availability of nuclear and hydro.

And I would say that in the wintertime, the

availability of hydro's certainly less, and often less. And also, nuclear, a lot of times that's when they do their planned down time.

So, really, if you're looking at adding heating load, space heating load in the winter, I think you really have to consider what is that mix going to be in the winter, to see if it really has a significant GHG benefit.

I'd also say that when you look at the cost of electrifying space and water heating, people are really focused on that unit in the home, and I don't think that they consider the secondary cost of the distribution system and the transmission system to meet that additional load.

You're talking about shifting peak load from summer to winter. Because space heating load in the State, while it's a very temperate state, space heating load is really quite significant.

And so, I'm not sure that that's actually been fully captured when people talk about the cost of electrification.

MR. RECHTSCHAFFEN: Can I follow up, Allison? Are you, at this point, suggesting policy prescriptions? Because you mentioned how, in the transportation sector there's the Low Carbon Fuel Standard, the Federal

Renewable Fuels Program, the RPS for biomass, there are other policy incentives in place.

Is this something SoCalGas is looking at as a way to reduce its GHG profile, to meet a potential energy resource standard? Or on the natural, are you suggesting and recommending that the State consciously create -- do more to move this policy forward?

MS. SMITH: I think, initially, since it is really kind of an early market that's developing, I think putting some more incentives towards helping the production and development is going to be important.

But I do think longer term that we're going to have to have markets in place to support the long-term production. So, we will need to have policies that support the use of renewable gas.

COMMISSIONER MC ALLISTER: So, one final question. And then, I don't have any blue cards, but if somebody wants to talk about this topic, we have exactly negative three minutes.

So, on the sort of flip side of that, what's the sort of impact of the greenhouse gas allowances that the current system would need? Sort of, you know, that are embedded, now, in natural gas consumption. You know, how much is that going to add to the lifetime cost of, say, today's space heaters or water heaters, the

operation of the -- you know, as those prices go forward, what's your sense of the impact of covering those allowances if you incorporate it into the cost of those devices?

MS. SMITH: Well, currently, the projection for fossil natural gas costs are very low. And so, when we look at, you know, the $20 carbon price in cap and trade, we're not seeing a big increase in the delivered cost of gas to consumers.

If that price goes up significantly, you'd see an offset and an incentive, really, to go towards more renewable natural gas.

And so, our projection is that, actually, the prices of natural gas, while they would increase when you go to more renewable supplies and reflect the carbon price, that they're still going to continue to be competitive.

We have a very abundant supply, and so mixing that abundant supply of fossil natural gas with renewable natural gas can be cost effective in the long run.

COMMISSIONER MC ALLISTER: So, it sounds like there might be a difference of opinion here between SMUD and SoCal.

MR. BARTHOLOMY: I just want to make a couple

comments. On the cost numbers that we've looked at, it looks like it's about a 5 to 10 percent increase on retail rates with today's carbon prices. So, I would agree it's certainly a low adder for the carbon price.

But on the cost of renewable natural gas, we've looked at a variety of different sources of renewable natural gas in terms of the total potential supply that's available. And the supply that's available cost effectively.

And we're very supportive of the State capturing as much of that as possible for meeting our RPS and for meeting heating needs. But we just see it as fundamentally a limited supply. And especially if you start doing dedicated power to gas, or gasification of dedicated energy crops, I think it's going to be a significant premium for those resources based on the pilot projects that we've attempted to do relative to gasification technologies, in particular. And, also, dairy, capture dairy biogas.

COMMISSIONER MC ALLISTER: Great, thanks very much.

Let's see, we're a few minutes over. I'm going to hold my tongue and not talk about ZNE. Allison, you mentioned ZNE, but I didn't want to push that off to the proceeding where that will be treated in the building

standards context.

And with that, I think we're almost on time. I'm very proud of us. Thank you very much, those of you on the dais and in the audience.

Let's break for lunch. And, let's see, the schedule has us coming back at 1:45. Let's try to keep to that and just cut five minutes off of our lunch break. And we'll see you back here then.

Thanks to our panelists, both in the first round panel this morning and just now. Thank you very much, very quality stuff, so appreciate it.

(Off the record at 12:52 p.m.)

(On the record at 1:53 p.m.)

COMMISSIONER MC ALLISTER: It turns out we did need an hour for lunch.

All right, well, we're back, very excited to get started on the afternoon. A new set of panelists, another pretty hot topic here with the first panel of the afternoon. So, I want to get going.

Let's see, what's our order here. Is Aaron Johnson, first? Oh, Talbot. Talbot, go ahead. Oh, Talbot, you're first, right. Great.

MR. GEE: I'm first.

COMMISSIONER MC ALLISTER: Are you guys sitting in the order on the agenda?

MR. GEE: I'm happy to move to that side.

COMMISSIONER MC ALLISTER: No, it's okay. I'm not looking at the agenda. My bad here.

Let's see here. Okay, oh, yes, Talbot Gee. It looks like you are in order. That's great, way to go.

(Laughter)

COMMISSIONER MC ALLISTER: Oh, hey, Snu, you've got to get in your spot there, yeah.

MR. PRICE: Yeah, I'm working on it.

COMMISSIONER MC ALLISTER: Okay, let's go ahead. Thanks a lot.

MR. GEE: My name is Talbot Gee. I'm with the Heating, Air Conditioning and Refrigeration Distributors International, or HARDI. We represent wholesale distributors, HVAC and refrigeration equipment, and supplies and parts. And we also have associate members of the major manufacturers, component and parts manufacturers, as well as reps and other entities within the industry.

So, we are also one of the founding members of the WHPA, the Western HVAC Performance Alliance. And I currently sit on the Executive Committee of the WHPA.

So, this topic has been all consuming in WHPA over several years, a long time, actually. So, I'm not sure precisely where you might want me to start on this,

except for the stand point that I'm coming, representing the people who are kind of in the middle of all of this.

So, when we talk about codes, standards, too, there is the policy aspect, which has all the best intentions in the world, and then there's the opposite end where the rubber actually has to actually meet the road.

And that's kind of where we sit. In fact, we're actually in an even more, sometimes more uncomfortable position because we are actually in between the manufacturers, who make the product, and then the contractors who actually install the product and are trying to serve their customers, the end-users, be it commercial or residential.

So, to say we serve a lot of masters is a little bit of an understatement here.

And the issue, as it relates to codes is, you know, there's a lot of potential for good things and advancement, as it relates to energy efficiency, and building performance with codes and everything like that. But there's an awful lot of unintended consequences, as well. And that's kind of where we get into the pickle here, a little bit.

So, I'm hopefully able to stick around for the next panel, because I won't be such an energy efficiency

Grinch in that one, as I might come off in this one. We're big proponents and supporters to drive energy efficiency and we feel we're an integral part of all that, with HVAC and refrigeration solutions.

But the code aspect, I would just kind of jump out there and say one of the biggest challenges or impediments to energy efficiency improvements in the State is the application of Title 24 to existing buildings.

It is an animal that cannot be wrestled to the ground. And I think the codes make a lot of sense when they are realistic. And when I say realistic, I say that they make sense to the people who ultimately have to comply with them. And that is actually your building owners, your homeowners and building owners.

And what we've seen, and I'll focus a little bit on the residential side, first, is a huge disconnect, and consumers not seeing the benefit to them to complying with the code. And, frankly, not wanting to pay for compliance with the code.

Even absent code compliance, the cost of our solutions has continued to go up as the complexity and the standards have increased. It's actually about threefold what it was before the old air conditioning standard of 10 SEER, that phased out in 2006.

So, just without any code changes, just right out of the gate it's three times more expensive to do a replacement of a central AC system than it was before.

You add on top of that increasingly more expensive code compliance cost, and we end up with a situation where it's ripe for a black market, frankly. You're encouraging activity outside the system.

And now, our membership, in particular, is getting in an awkward situation here, where the State is trying to figure out if we should be part of the solution to fixing that problem that, frankly, we didn't really have anything to do with creating in the first place.

And that's a difficult spot to be in. Because as any of you know who run a service or serve customers, you ultimately serve the customer and what the customer wants. You can't make them want something. It doesn't work that way. And markets will find an alternate solution if what you're trying to push them isn't what they want.

And if that happens, our guys lose their livelihood, that doesn't work.

So, this idea of code compliance being driven by industry in the channel, and the people who are ultimately tied to serving the end customer is a huge

leap to make.

So, what I would argue is let's focus on continuing some of this great progress on new construction, new buildings, both residential and commercial. Take a step back from the existing building side of it.

And by the way I mentioned, by being very aggressive on the existing building side of it, you've actually created a bit of a disincentive to investing in new buildings. Because the assumption becomes, oh, well, my existing building has stayed up to code and it's performing so well, why should I spend all this more for a new building, a new home, a new commercial building, whatever. Why create that competition that way. Make the new buildings look as cool as they really are, as compared to the existing building stock.

And then, let's use efficiency programs, holistic approaches, market transformation, all like that to try to nip away at that existing building market as best we can.

But using codes and standards, frankly, is going to be a tough one. And the example, I came in late to one of the earlier sessions and they were talking about transitioning water heaters to electric water heaters. Well, we're in the middle of a Federal standards

transition right there, and I will tell you it's not that easy.

A lot of water heaters just simply don't fit where the old water heaters fit. So, you can write the best code in the world, but someone's not going to remodel their house to put a water heater in. It's just not going to happen.

So, anyway, I guess I'll just kind of rest here in just saying let's be realistic and focus, but let's focus on the stuff that we really can kind of control, which is the new building market, and then find more market-driven solutions for the existing building side. And I think we'll come to a more efficient, cost-effective end in the long run.

And also, find a code that works well with those efficiency programs. Right now, our sense is they kind of conflict. They actually cut the legs out of a lot of efficiency programs which, again, doesn't really serve anybody's end purposes here.

So, with that, I hope that's what you were looking to hear, but anxious to answer any questions anyone may have.

COMMISSIONER MC ALLISTER: I'm sure we'll have questions. But let's power on through and get everybody's first lob in there.

So, Matt.

MR. HARGROVE: Good afternoon, thank you for having me. I'm Matthew Hargrove, with the California Business Properties Association. We're a trade association here, in California, that represents many national commercial real estate groups, everyone from the Building Owners and Managers Association of California, International Council of Shopping Centers, NAOP, which focuses on industrial buildings, and several other associations. So, we're basically an association of commercial real estate associations.

That long introduction of who I represent is a key piece of the information I want to impart today, is that commercial real estate is very varied. You have everything from very pretty, nice, shiny, downtown, Class A office buildings that are extremely energy efficient, to very large industrial buildings out in the desert, that are also extremely energy efficient when you look at the envelope, and everything in between.

What we're seeing, through California wanting to maintain its mantle of being the most energy efficient building code state in the nation, which is why we're here discussing this, is because we are, is that you're starting to see a bifurcation between existing buildings and new buildings.

And you're also starting to see a huge bifurcation between very large, corporate entities that can handle all the quick, and fast, and complicated changes, and very small companies that find it very difficult to keep up with the changes.

In particular, with the new buildings, what we're here to praise the Energy Commission is that making sure that folks, when they're building new buildings, have informed decisions. And we do think that your code process is very open. It has been, at times, very aggressive.

Two cycles ago, or the last cycle, when there was a 28 percent jump, we argued at the time that was too big of a jump and it was going to cause some implementation problems. And we're working through that, now, with your staff and with all of you, and we appreciate that.

But it's a great example of this discussion point of sometimes getting a little too aggressive, setting goals that are not -- well, stretch goals. And what happens when you set stretch goals, when you're talking about very practical applications.

We think we need more training out there because of the rate that the Energy Commission, and the State in general, with regulations has been moving in terms of

going green and adopting very complicated, theoretical code. That there needs to be more education of the local building officials who, in many instances, we're turning to, to help clarify the rules and regulations. Coupled with the fact that many local planning desks are not as big as they once were, that's even more important that the State take a leadership role in that. If the State is going to be adopting such aggressive codes, that we make sure that all the jurisdictions that are out there, that are on the ground working with us and, quite frankly, the utilities that are working with us have the tools and information at which they can impart to the folks who have to comply with these codes and regulations.

In general, again, we're seeing existing buildings having a lot of complications keeping up with Title 24. And I never had a real example, until recently, of where we saw that this was a huge issue.

And recently in San Francisco, I was talking with a group of building owners, who were finally complaining about the State energy code. And to hear a group of building owners in San Francisco complain about the State energy code is very odd because San Francisco has been so far out ahead of where the building code is. But it's finally caught up with them.

And what we're hearing from building owners, in San Francisco, is that they're starting to see tenants make decisions based on economics in terms of tenant improvements.

What that means is in the past, for us to come in and do a five- to seven-year tenant improvement, it was just really a simple negotiation. It wasn't extremely expensive. And that tenant improvement went through. And that was a good thing, because any time we do a tenant improvement we're building to the current building code.

What we're seeing now is when we go to tenants and say, this is the cost of doing this tenant improvement, we're starting to see, very quickly, blowing through the building owner's budget for tenant improvements, and starting to push a lot more of that cost off on to the tenant.

And we're starting to see tenants saying, whoa, we can't handle that cost. Why don't we just put in some new carpet and a fresh coat of paint, and we'll be happy signing the new lease.

Well, what happens when you do that is you're leaving in the old technology, the old code, and you're stymying the new code from being put into that existing building.

So, we think that being so aggressive with the codes and being so aggressive in applying them to existing buildings, you're starting to have a negative effect on the edges, in terms of people, tenants making cost-based decisions.

Incentives are needed. Especially, this morning we heard folks, and over the past couple of years talk about putting in societal benefits into the calculations that you use in terms of cost effectiveness.

Well, if building owners and tenants are going to be expected to pay societal benefits through their building codes, then the State really needs to step up and provide incentives to work us through that.

Because ultimately, as we're working with tenants on tenant improvements, we need to be able to sell that tenant improvement to the tenant, who's going to pay for it. The building owner doesn't pay for this, in many instances. It works out through the leases.

And if we're trying to sell a 30-year commitment on new technology, and then on top of that some vague notion of societal benefits, we're going to have many more tenants saying no, thank you, just put up a fresh coat of paint and we're good with that.

We hope that the Energy Commission, and the State as a whole, starts doing more ground truthing.

You're very, very good up front, before the codes are adopted, at looking at the theoretical savings. And there's a line out the door, many times in this room, of people coming in to advocate the theoretical savings of all these great things that you're adopting.

But when we do workshops at the tail end, those same folks aren't here when we're looking at the actual savings.

So, we really hope that the State will start looking at the actual savings. Are the policies that we're adopting having the impact that we thought they were going to have at the time we adopted them. And I think that will help all of us make some better decisions, as we move forward, in terms of how aggressive to be.

So, I'll leave it at that. Again, we're very thankful to work with the Energy Commission, your staff, you've been open on this. We're proud, as folks who own and manage property in the State of California, that we have the greenest buildings in the nation, and we do. But we want to make sure that policymakers take a step back, look at this strategically, and I really think it's a decision on how aggressive do we want to be? Do we need to have 30 percent jumps every time? Or, is a three to five percent jump okay, if we've done a 30

percent jump three years before. Thank you.

COMMISSIONER MC ALLISTER: Thanks.

MR. JOHNSON: Good afternoon. My name is Aaron Johnson and I'm with PG&E, and I have responsibility for all of our various customer programs, like energy efficiency, demand response, customer solar, electric vehicles, things like that.

Because it's the utility way, I have a Power Point. So, I will try to go through this relatively quickly.

First of all, just in terms of introducing PG&E, so first slide. So, to answer Chair Weisenmiller's question from earlier today, I could have jumped up, but I think we got an answer. We run about $650 million, PG&E does, of DSM programs, the vast majority of them are energy efficiency. Also, the ESAP, the Energy Savings Assistance Program, which is the low-income weatherization program, and then a much smaller demand response portfolio.

We have the privilege of administering these programs on behalf of ratepayers in our service territory. I would like to highlight that we are not the primary entity actually delivering these programs. We have a tremendous number of partners, both private and governmental, that we work with, a tremendous amount

of trade associations that we work with to actually implement this program.

And most of those folks are selected to run those programs through competitive solicitations of either the RFO or RFP variety.

The next slide. I wanted to talk about three key points today. I want to talk about capturing to and above code savings in buildings, leveraging smart meters by measuring savings at the meter, and ultimately look, also, at how we should evolve our effectiveness tests for energy efficiency.

When we see the Governor's really aggressive energy efficiency goals that have been laid out there, we're excited, but we see a big challenge in front of PG&E. And we're excited to take that on, but we definitely recognize that there are some things that we're going to have to do differently going forward, than we do today, in order to be successful at meeting those goals.

So, next slide. So, the first topic I want to talk about is energy savings below code or going up to code. And I want to highlight the results that have been making the rounds, generally, of two studies that we commissioned various sort of data providers to put together for us.

The first is a study that was done by Pulse, now part of EnerNOC. And this study began by looking at a very large section of our nonresidential buildings in our service territory.

And what you see from this study, which ultimately looked at about almost 70,000 different businesses, commercial buildings in our service territory, is that two-thirds of the savings that can be found in those buildings is to be found below code, not above code.

So, we recognize, obviously, older buildings are still compliant with the code that was in place at the time. These are not, obviously, buildings that are out of compliance in any way. They're in compliance with the standards of when they were built. But they're certainly less efficient than our modern code standard.

And just to be clear, we saw these sorts of results for these, this swath of buildings across our service territory. So, we saw it across different sectors and it was very similar results, and also across different climate zones, very similar results.

The next slide. So, this is a little bit of drill down. And this study was done by First Fuel. And they began looking very specifically at a number of buildings. And, in fact, they looked at 164 buildings

across office, retail, grocery, school buildings all in the Central Valley. And we saw more of similar kinds of results. What we see is about 25 percent of the savings are above code, the stuff that we're allowed to offer incentives for today, under State policy.

And then, about 75 percent of the savings were things that we don't offer incentives for today. And that was a mix of to-code, you know, getting buildings up to modern code, and also operational and behavioral savings that can be found. You know, are things really working the way we intended them to work?

So, again, reinforcing this idea that a lot of the potential that's out there on energy efficiency is stuff that we're not going after today.

The next slide. So, to belabor the point, I will show one last slide. We have -- this is those 164 buildings, and we stacked up the operational savings of the top 100 buildings, from left to right. So, the highest bar represents the most savings to be had.

Don't worry too much about all the colors. The main thing to recognize is that the yellow is the above-code savings, and the blue and the purple hashed are the, basically, operational and to-code savings that we don't currently pursue through incentive programs today.

And so, we stacked up the top 100 buildings in

this survey. And then we looked at them and we said, okay, so we put this big, dramatic red bar on the top 20 candidates for potential savings.

And then, we look at what will actually happen under the programs we administer today.

The next slide. What you see here are the ten buildings that we decided would be the most likely to move forward with energy efficiency measures today. And this criteria is not scientific. We made up this cut. But the cut was we assumed that at least 50 percent of the savings in the buildings needed to be above code and, therefore, would be able for the customers to get a rebate on. So, we just made an arbitrary line, let's say 50/50. So, which of these projects actually have the savings where more than 50 -- or 50 percent or more of the savings are above code.

And what you're seeing is you're getting only 10 of the top 100. You're getting none of the top 20. And, you know, you're getting a few projects in the middle, outside the top 20, and a lot of tail savings.

And this is really reaffirming to us that there is great potential savings to be had in many buildings and we're not pursuing that aggressively, as we should. And a lot of that involves getting things up to code.

So, next slide. This is my second point. I

don't have any pretty graphs for this one. All I have is a picture of a meter. We spent about $2 million -- about $2 billion, not million, billion dollars upgrading the meter network in PG&E's service territory over the last seven years or so. This is a phenomenal system. It's providing us all kinds of interval data that we've never had access to before. Big data analytics is coming at just the right time. We're going to do really interesting stuff, figure things out we haven't been able to figure out before.

One of the things I think we could use this meter for is to measure savings in buildings. Let's leverage this network.

I understand that there is incredible intellectual rigor and justification in doing a lot of the traditional EM&V that we do, that will really help us understand what programs are truly effective. I don't think we should dispense with that kind of study and research around our EM&V activity.

But today, the three IOUs spent a billion dollars on EE, and I should say we spent a billion dollars of ratepayer's money through the public goods charge. And that money, $50 million of it is spent on EM&V. I don't think we need to dispense with all of that, but I think we could certainly repurpose some of

it to actually be doing energy efficiency.

And, ultimately, the meters really tie in with the below code savings. Because if you're using the meters and you're measuring the actual savings, you're not really differentiating between what's operational, what's behavioral, what's below code, what's above code. You're just saying we're saving energy.

Now, there are very good intellectual arguments out there about free ridership, about people that were going to do things anyway. Those arguments are there and they're legitimate. But we think in order to go after these aggressive, new goals, but we're going to have to move beyond that construct.

I do want to just say that if we go after a lot more savings, obviously, there's the potential, you know, is this the utility's way of tripling our budget? That's not the plan. Obviously, we're going to have to reset incentive levels if we go after below-code savings because we'll be tapping into far greater levels of energy savings.

And so, we're going to want to -- we're going to have to look aggressively at incentives. As we approached this issue, we had thought very much from the stand point of what if we had the same budget we had today, how would we move forward in a new paradigm?

Not, let's necessarily expand the pie. We made decide as a State we want to do that. That's a very legitimate outcome of these new, aggressive goals, but that's not the mindset that we're taking into looking at going after below-code savings.

And the last topic I wanted to cover is just looking at the tests, basically, the cost effectiveness tests. And so, what this graph shows you is various cost effective tests. Obviously, you want to be above one to be in the money, and that's on the Y axis. And then, we have a number of different technologies displayed on the X axis.

And what you see there, in brown, is the TRC. That's the total resource cost. That's all the costs and benefits of participants and the utility, and we lump those in together, today, and try and maintain a utility portfolio that's at least at 1.25.

And then you have the program administrator cost. And what this test looks at is simply what are the costs to the utilities and the benefits of administering the program, not the participant costs.

And to sort of highlight this difference, I want to share an anecdote from a member of our staff, who was talking to a friend, who was upgrading his apartment in San Francisco, his condo. And he wanted to put in on-

demand water heating. And he said, you know, this is great. He hassles his friend, who works at PG&E and says, how come you don't offer a rebate for this technology? And Luke's response is because it's too expensive. I can't. We don't do that, we don't offer rebates on expensive technology.

So, what we're effectively telling customers is we're looking out for you, and we don't want you to spend your money on that. That wouldn't be a cost effective use of your own money. So, in effect, we're stifling some of the more innovative and, yes, expensive technologies that are out there on the front lines, that will be tomorrow's not-so-expensive technologies.

But because they can't pass the total resource test, or total resource cost, we don't end up offering incentives for those kinds of technologies. We shouldn't dominate our portfolio with new technologies, but they shouldn't be excluded, either.

So, moving to something like the PAC test would be a much better way of capturing some of those kinds of technologies and offering incentives on them.

So, my last slide is just to wrap up those three points. I think we'd like to see, as we look to meet these aggressive new goals going forward, capturing to and above code savings in buildings. Leveraging this

great smart meter network that we've put in, put it to more use. Obviously, we've just had rates decisions that are going to look at moving all the utilities to default time of use rates. That's coming in a number of years. Obviously, that's one of the big goals of those meters, but we think we can also use them for -- to get better at measuring energy savings.

And then, ultimately, in order to effectuate all this, I think we're going to need to look at the cost effectiveness tests for EE a little bit differently going forward. Thank you.

COMMISSIONER MC ALLISTER: Thanks.

Snu.

MR. PRICE: Thank you. My name is Snuller Price. I'm a partner at Energy Environmental Economics. Thank you for having me this afternoon.

E3, as some people may know, has been really working hard over the last couple of years to look at what are long-term pathways for California to reach deep GHG reduction targets.

And we think in, really, every scenario we've done, that energy efficiency is going to play a key role in that transformation.

And so, what I wanted to talk about this afternoon is, given that, what -- how well are the cost

effectiveness tests that we're using in this State working for us in that sort of longer-term context?

E3 has been working -- and, Heather, if you want to go to the next slide. E3 has been working with the CEC and the CPUC on energy efficiency cost effectiveness for a long time. It's been one of my major things that I've done in my career.

The CEC, Title 24 Program for new construction, and as our other panelists pointed out, also for major retrofits, uses a time-dependent valuation methodology. And it's used, really, for two things. One is to develop the prescriptive packages in buildings and then the other is to, oh, evaluate tradeoffs.

And I think the important thing to know about TDV is that it's looking at cost effectiveness on a sort of modified participant test.

So, we're trying to make sure that the mandates in buildings are going to be cost effective for the people we are mandating. And I think that has been part of California policy making since, you know, I think it's the 40th anniversary of the Energy Commission and I think it's been here, and is an important part of it.

The other major energy efficiency cost effectiveness testing in California is under the California Public Utility Commission Energy Efficiency

Program. And as Aaron mentioned, we spent about a billion dollars or ratepayer money every year. And the public utilities, I know there's some in the room, also spend a similar amount on their cost effectiveness programs to do similar cost effectiveness.

And those tests are really there to safeguard public money, make sure that we're spending money that we're collecting in rates well.

And the perspectives tested under the PUC energy efficiency program, as Aaron pointed out, the total resource cost test has been sort of the fundamental test. But all of the other tests, looking at sort of the distributional impacts, who's paying for the benefits, who's getting the benefits are also tested under that framework.

So, if we go to the next slide. There's a couple of things, looking at the long term, that are really important. I think the first thing is, you know, energy efficiency is still going to be about saving money. Right now, when you do an energy efficiency program, you save both GHG emissions, because you have to generate less electricity, or you consume less natural gas or propane.

But when you look at the long term, you'll see there's sort of diminishing returns. As we add more

renewables onto the system and the grid gets cleaner in terms of the mix, we'll be saving less and less GHGs, and more and more money.

So, I don't think we should change the energy efficiency metric to be a dollars per ton. I think we should stay focused on how much are we spending on energy efficiency, how much are we saving in terms of, you know, actual money? I think it works really well for that.

And I don't think we have to scrap our cost effectiveness frameworks and just start all over. I think we need to do some updates, some very specific, some maybe -- and I'm going to point out one in particular, one thing that's a little bit bigger.

But I think it's really in the land of updates and adjustments as we start to look at our portfolios, rather than just wholesale start over.

You know, for example, we could use more recent information. One of the things that's always tricky is the cost of things. As they are kind of continuing to develop, are we getting the right lifetimes? Are we looking at the right economic horizon?

One of the things that we're working on and are really interested in is as we get a much more renewable electricity grid are we really -- we factor in the value

of not having to buy as much renewables, but are we really capturing the right cost of integrating all those renewables onto our grid is an area that I think is important.

So, I think energy efficiency cost effectiveness is going to remain useful to allocate limited money intelligently, and to define the code in the buildings.

If we go to the next slide, this is the last slide. I think there is one area that the State has not looked at in a lot of detail, and that is fuel switching. And, particularly, if we're looking at fuel switching from natural gas to electricity as a carbon reduction measure, our cost effectiveness metrics are really going to kind of break down.

So, the CEC's TDVs discourage fuel switching from natural gas to electricity. So, it won't pass the cost effectiveness screen. So, if you want to do that, indeed, then obviously, the TDV would have to be updated.

On the PUC side, similarly, it's very difficult to pass the participant cost test, particularly, if you're going to try to switch people from natural gas water heat, and space heat, because electricity is more expensive.

So, either of those -- in neither of our cost

effectiveness frameworks will that work. So, you know, we've looked at, in our long-term GHG reductions different pathways for reducing and getting to GHG savings. But, really, I think the fuel switching piece is the one area where, really, it wouldn't -- our current frameworks won't actually work.

So, happy to participate in the panel and any questions that come up.

COMMISSIONER MC ALLISTER: Thanks a lot.

Cynthia.

MS. MITCHELL: I'm better standing up. Thank you so much. I've been asked to address question nine, regarding cost effectiveness. But I certainly, for a turn, have opinions that I'd be glad to offer on questions 7 and 8.

And thank you for having me here this afternoon, in this room full of all these intelligent, good-intentioned, hardworking and dedicated individuals.

Last month marked 41 years for me as a utility consumer advocate and energy economist, 15 years as TURN's energy efficiency expert.

And I'm here today with good news. There is plenty of economic efficiency in California ready to harvest, and I don't think it's going to be all that hard to do. So, keep your summer vacations, eat

healthy, get your sleep, exercise, and love your family and friends.

The next slide. Generally speaking, and with due respect and appreciation, Aaron, California's cost effectiveness methodologies are not the limiting factor in the scale and scope needed to reach California's climate goals.

The trick is in going beyond relying on consumers for voluntary uptake of efficiency with their own capital. We must finance efficiency like an energy infrastructure investment akin to generation, transmission and distribution, and now solar energy storage and electric vehicles.

This is essentially what my November 2014 electricity policy article, *A New Energy Efficiency Manifesto for California*, is all about.

More recently, Jeanne Clinton's May 26th talk, as part of the CPUC Leadership Platform on how to make efficiency more like solar or purchase power agreements.

The next slide, please. We saw a version of this slide earlier. Here's all that efficiency that I spoke of. The top line denotes what's economic. The bottom line is, at best, what is forecasted to be achieved.

The orders of magnitude here are startling.

We're at, say, 35 to 50 thousand gigawatt hours of what is economic. And then we start at about 2,000 gigawatt hours, maybe upwards of 15,000 gigawatt hours, over the next ten years, of what's achievable.

So, here's the puzzle. What is the difference here? Clue; it is not the cost effectiveness methodology. Both economic and achievable are based on 20-year-long avoided cost. These analyses, economic and achievable, are both 20-year-long run avoided cost.

Economic assumes efficiency is financed like an energy infrastructure investment. Large capital markets, 20 plus years, okay. Achievable relies on consumers for voluntary efficiency uptake with their own capital.

The fly in the ointment is the assumption that consumers are willing and able to make efficiency capital investments based on 20-year payback horizons.

The landmark 2009 McKinsey Group report, documented that consumers have very short paybacks, 18 months to four years, whether it's residential, commercial, industrial.

What are we getting from achievable? Well, it's largely a lot of low-hanging, compact and linear fluorescent lamps. One-third of our savings, now, are coming from codes and standards assuming high compliance

rates. At best, the portfolios are marginally cost effective.

And in all due respect, it's turned into a huge and complex *Rube Goldberg* construct of 200 plus programs.

So, back to the good news. Economic generally matches the carbon reductions needed from the electricity efficiency sector per AB32 and the Air Resources Board.

So, we're in the money here on what we need to do and we have the resource.

The next slide, please. Briefly, let's be clear about California's long-term trend in consumption. Here's 40 years of absolute consumption data.

And the next slide, here's 40 years of per capita. Okay, the long-term trend is increasing consumption absolute and per capita, with only brief down tics from recessions. Obviously, recessions are not a good way to manage carbon.

The next slide. We need -- oh, go past that one, too, please.

We need new transaction structures. We need to finance efficiency like an energy infrastructure investment. We need to meter efficiency and pay for savings as delivered. Turn efficiency into a cash flow

which can then be financed.

We need pilots to test efficiency bundled with other distributed energy resources to achieve site-specific, and I mean residential and commercial buildings, savings of 25 to 40 percent.

NRDC and TURN have pilot proposals before the Regulatory Commission in the Efficiency and IDSM proceedings. We had Lisa Schmidt this morning, with HED [sic], talk about her company and their product. There's people coming out of the woodwork with all kinds of ideas this way.

Use dynamic baselines, which are essentially counter factual, load and consumption algorithms, and smart meter data to create transparent and a real-time accounting for savings.

The next slide. The next slide. Okay, let's look at the need for efficiency bundled with distributed energy resources via the duck's neck, okay. This reflects the run up in late afternoon and evening space cooling loads. Simply feeding the duck's neck with stored solar surplus, without turning down the space cooling load grid heat, will perpetuate over built distribution systems and inefficient distributed resource asset utilization.

Know that commercial and residential space

cooling loads cause over 30 percent of California's total summer peak demand and so it's, obviously, an enormous and costly impact on the need for distribution infrastructure.

And then the last slide. As a small-time chicken farmer, I'm going to leave you with this. While it works for chickens to do the same thing every day, the status quo will not get California the efficiency at the scale required.

And I ask the people in this room of power to step up and take bold, decisive action. Allow for experimentation with new transaction structures. Reward both successes and failures. Only inaction should be penalized. Thank you very much.

COMMISSIONER MC ALLISTER: Thanks very much.

So, very thought provoking and I really appreciate everybody being on the panel. I think we have quite a bit of time remaining on the panel, so I think we have a good opportunity to ask some probing questions.

So, really, as I see it there's kind of two, at least two sides to this issue, to this coin, probably more. One is, I think keying off of Matthew Hargrove's comments, as sort of, you know, how can we make the code, itself, more navigable by existing buildings?

And I think that's something we've teed up in a number of ways in the AB758 action plan and really need comment, I think, from all of you. I mean, we've gotten some comments on that but, frankly, not as many sort of solutions-oriented comments as I would hope. And I really want to -- you know, if we're going to take a modified track or develop new tools to apply code specifically to existing buildings, you know, taking into account the fact that the cost profiles and the cost effectiveness are probably different, in many cases, from a new construction scenario for the same measure, that's going to require a lot of spade work.

And I think, you know, I'm certainly willing to entertain it, but I need a lot of help from stakeholders, and our staff really needs to hear from stakeholders on that.

We've been working through a bunch of issues for lighting and HVAC, et cetera, on that front. They do look different for existing buildings.

So, you know, have a look at the action plan, again, and put your thinking caps on there. Certainly hear what the industry is saying about that issue.

I guess, I did -- I wanted to ask Aaron a question. So, you know, in your thought-provoking columns there, where you've got the yellow, blue,

orange, you know, are you saying that the blue are not happening? That those, the to-code savings are simply not happening? Or, I mean I think it's easy to say here's a bunch of potential for to-code savings. And you're implication is that if you could only offer a rebate, those would happen. And I guess, I think there's a fair amount of kind of unpacking to be done in that assertion.

And then, you know, driving at the worry at driving underground is sort of a complementary question. If we make code hard, and people don't get a permit, and they go do it, say, in the residential sector, they do some project, but they go with the cheap version, without a permit, are savings really being left on, unrealized?

And so, maybe, Talbot, you could talk about that, too. But just because a project doesn't get a permit, doesn't mean that a lot of savings are being left behind. I think we'd have differing opinions about that in the room.

So, really, a two-part question.

MR. JOHNSON: So, we don't know the full answer to whether or not the code is being adopted at the rates that are assumed.

We do receive credit -- to be fair, we receive

credit under the Commission's methodology, Cynthia talked about it. That there is a level of adoption.

And I think one of the next areas of research that we have to focus on, on this, is what is that level of adoption that we're actually seeing?

So, I think the answer is it's incomplete at this point.

I think I do want to, you know --

COMMISSIONER MC ALLISTER: I guess I didn't quite understand your answer. So, could you maybe rephrase that in a way, sort of how are you going to find out, maybe, what naturally occurring savings are, which I think is what you were just talking about. But also, just, let's see, whether a program initiative has a needle to actually move?

Like, if you were to actually have a program that did target and pay an incentive for those savings in the blue, you know, the to-code, would those have happened anyway? Like what do you know? What sectors would you imagine the most unrealized savings to-code actually lie?

MR. JOHNSON: I don't know off the top of my head which sector I would say is the most potential there. I think generally, you know, I don't want to say that I think that an incentive would necessarily tap all

that potential. That was the other part of your question. And I think, for the sake of policy, we need to simplify complex issues down.

We know it's not quite that simple. I mean, we have some interesting data that we've done, recently, surveying a broad brush of customers around why they actually chose to do energy efficiency. And it was all over the place, 22 percent said comfort, 21 percent said save money, 17 percent said save energy, 13 percent said it was the rebates, 10 percent said it was about the environment, 10 percent said it was about air quality, 6 percent said -- I can't remember, I can't read my own notes. So, it was other, the other category.

But, so, it is all over the place. So, we don't know exactly which -- you know, whether the incentives, themselves, will ultimately drive.

My point is simply that that has been one of the primary tools that we've used in California to get people to do programs. I don't think it will be a great panacea to offer a rebate. And those rebates are going to have to be less, unless we substantially increase the budgets for these programs. But it is something that we can offer to make sure that that's happening.

And I think the piece that comes with it, on the EM&V front, is that we do need to do better research

around what are those natural uptake levels. Because I agree with the point, if stuff is getting done below code.

But generally, what we're seeing is there are great assumptions about that being made. And when you go out and look at the potential studies, it appears at a high level that it's not keeping pace.

MR. RECHTSCHAFFEN: If I could just follow -- go ahead, Carla.

CPUC COMMISSIONER PETERMAN: Well, I just wanted to follow up with a couple of related questions. So, about, I think it's about 20 to 40 percent of the current IOU energy efficiency portfolios allow for a deviation exemption to the current baseline policy that we've been talking about, the opportunity to not use the codes as baseline.

So, I wonder if you could share some reflections from some of those programmatic experiences about, you know, have we seen greater uptake of those programs, and what lessons can we learn from the fact that we've allowed that, in some cases, to make that leap to perhaps a larger, more broader programs.

MR. JOHNSON: We're pretty early in that process, so we do have some mandates. Some programs that are out there, the Whole Building Initiative,

principally, being one, and the Whole Building Retrofit. And we're looking at, you know, that very stuff.

We're just starting to see projects go in, now, and it's a little early to have any data that conclusively tells us whether we're having success with that.

So, I think we'll know very soon what the results of that look like, but it's still fairly early in that process.

CPUC COMMISSIONER PETERMAN: And just a follow-up question, so it might be the same answer. But since the last EE decision that authorized the utilities to spend some money to do some pilots, looking at getting to-code, and can you speak to what types of, you know, questions or new ideas that are going to be a part of those pilots? To try to, again, get us some more information about, really, what's the potential here.

MR. JOHNSON: I don't -- I don't think there's -- I mean, the primary -- so, it is the same programs, those same pilots that we're talking about, where we're starting to see them in the field.

I think what we have heard, generally, from the building folks that we've gone out with is the simplicity for them of knowing whether or not they're being successful with their programs. They also like

the ability to just go after the operational savings, as well.

You know, they have their own meter readout data every day, and they have control over what they know they're actually achieving as a customer on a program. Versus the sort of black box process that goes on today, where we will oftentimes come much later and do, you know, a rigorous EM&V process much later, down the line.

MR. RECHTSCHAFFEN: I just wanted to follow up a little more from, Aaron, your discussion with Andrew. And you highlighted the potential for free ridership in the program, and your survey results indicated why that's a concern. Because people do efficiency upgrades for lots of reasons.

So, I'm wondering if you, or any of the other panelists, might have ideas of how to deal if we do -- you know, if there are changes made to this below code baseline determination, or above code determination, how to effectively safeguard against this, a big, free ridership problem.

MR. JOHNSON: I don't have a panacea for that question. I think, I step back and say we're sort of reaching a point where, from my perspective, the levels of energy efficiency that we're talking about doing in California, and I was very struck by, Commissioner

McAllister, your graph. And, you know, what we're talking about doing from a scale stand point, with the graph you led off the day with.

At some point, does it matter? Don't we just need the energy savings?

MR. GEE: I'll put the bulls eye in my chest for a second here, since you've been taking most of the heat here.

But this has been our experience is, is this pursuit of perfection destroying any opportunity for good, frankly. And let's talk equipment, which is what I know, our industry, right.

So, the assumption is that absent any incentive, or anything, someone's eventually going to replace their air conditioning system with a minimum standard efficiency unit.

When we know for a fact that this State lags in replacement rate compared to the national average, right, so that doesn't actually happen at the rate that everyone thinks it happens.

So, what happens when they don't replace it? They patchwork it. And they patchwork it without any regard to code in most instances, right.

So, if you have a refrigerant leak, you just top it off and then you just wait for the leak to be bad

enough that you just have to top it off, again, because it's so much cheaper to do that than to replace the system.

Okay, so the concern that, yes, you're going to get some percent who are going to go ahead and make the decision to replace to a, now in this region, a 14 SEER system, eliminates any incentive that can be offered to get somebody, who would rather patchwork their 15-year-old, 8 SEER system kind of forever.

Or just go to a bunch of window units because that's their version of zoning, right.

So, I think when we get down into the nitty gritty, what we would really love to see is an ability for contractors, who are out there in the field, working with customers, have the ability, the flexibility and the creativity to come back and work with all the powers that be, with the utilities, the administrators, and say, here's an instance. They want to do it, but they can't afford. And this is what I think I can do in this instance right here.

You know, if they -- maybe this house has not been touched in 20 years, okay, and so there's a huge delta. Maybe it's simply an equipment replacement. But again, I mentioned, it's about three times the cost to do a system replacement now, than it was before.

Rather than trying to predict the outcomes of every single thing that we do now, why not create a more malleable system that can react to what the market is actually experiencing?

Enable or empower the industry, who is serving those customers, to come back and say, we understand you've got this finite amount of funds, but I'm telling you right now, if we do this job here we're going to save a bunch of energy. Adverse, what they're going to do without any help from you at all. Because I can tell you what they're asking me to do, without any help from you at all. And we just don't have that malleability right now.

And so, I think that's the opportunity. When we talk about code assumptions, the biggest problem we really have here, are based on truly assumptions. No one really knows. No one really knows. We've been dealing with this in the WHPA for five years, now. No one really knows what compliance rates are. They all know it's not good enough and they all know it's nowhere near the goals that the State has set.

But we do know, in limited instances, when we can talk to a building department, we get a sense that we just know that there's no way that number of permits for HVAC change outs equals the amount of work that's

being done in that size of a territory. We don't know exactly how far off that is, but we know that can't be quite right.

And so, I think we're making a lot of assumptions on a whole lot of unknowns. And, frankly, I'm afraid we're getting the cart well ahead of the horse because we don't know any of this stuff, but we're trying to get to some end point that we all think is achievable.

But we have really no idea. We have no idea how close or far to that we are.

CHAIR WEISENMILLER: Okay, so my question for the two gentlemen to the right is just, of Aaron, does his slides -- you know, you're out in the field. Does his slide strike you as true or false?

MR. HARGROVE: They strike me as true. I mean, we see lots of buildings out there that there's lots of saving can be had, if they pull a permit and go through with a tenant improvement project. I mean, that was my initial testimony.

Than what we're seeing is that bifurcation between large corporate entities, that are going to do this as a standard course of business. They need to do it, it's part of their bottom line. They're moving forward with these types of projects.

What we're doing in California is we're leaving behind, and I think, you know, there's a lot of these that would be categorized as free riders, but I wouldn't -- I wouldn't say they are free riders. They're folks who are on the cusp that would do this.

And as it gets more and more expensive to do these types of tenant improvements, a building owner has to have a number of things happen before they can do this type of investment in a building. One of them is they need the tenants to say, yes, we're willing to pay a little bit more money, we understand what's going on.

Sometimes they have long-term leases that they need to deal through.

In many instances, and this is something I don't think is as well understood in this room, as we wish it was, is many times you'll have a building with 50 tenants in it. And they're all coming and going, with different lease times, and things like that. So, even if you want to do a complete overhaul of a building, you do have the issue that you have real, live people that you need to deal with in order of moving forward.

And a lot of times you'll get businesses saying, hey, you can't rip the roof off the building. This is a very important year for us, or that's going to disrupt us to the manner that we can't have it happen.

And, I mean, in some of these instances that having the ability to say, look, we've got money coming from the State, we need to do this timing right now to do this type of upgrade on our building. Don't care if it's a little inconvenient for you, but we're going to push through it, is going to get at some of the blue that's in this slide over here.

And I think those will be folks that are being categorized as free riders, and I don't -- we would say that they're probably not free riders because that's not going to happen, otherwise.

CPUC COMMISSIONER PETERMAN: Thank you. This conversation has been helpful. I mean, I would like it if the three people on this end would talk a little more together to bring program ideas to us. Because we do have, I think we do have that malleability, with the utilities, at least, being able to engage with the Commission to bring forward proposals, to have programs that get up to baseline.

Now, if there's a disconnect between where you think in particular that malleability is needed, then that would be helpful to know.

And as a regulator, what I'm just trying to get my head around is between -- is there somewhere between, or what's the next logical pathway between requiring,

you know, baseline be to code and having no baseline? Because I don't think that's necessarily where we want to go, either. The free ridership issue becomes more of an issue depending on certain programs and what we expect, for example, the customer behavior to be.

So, you know, we've had it available now, for the last couple of years, that the utilities can bring forward program suggestions for market areas that are hard to reach, to identify this is an area where we really want to do something different with our baseline code.

And so, that's an immediate opportunity we have to work, already, within our existing regulatory structure.

MR. GEE: But I'll reiterate, I'll kind of challenge the State to let's figure out what that number is. I mean, again, we're talking about deviations off of some estimated or assumed number. We really don't know, right.

So, you know what the code's supposed to perform to, but if only -- I don't know, throw some number out. Some very low percentage is compliant, your baseline's way off from that model number. But we don't really know how far off, so it's kind of hard to say what's the baseline in this instance. Which is why it's kind of

attractive talking about more real-time evaluation, where it's literally kilowatts in and out.

COMMISSIONER MC ALLISTER: So, I want to push on that a little bit because, number one, I want to invite Hardy to participate in the Title 24 development discussion. Because it really is more about new construction, than about existing buildings. But it really needs that existing building voice.

And, you know, we depend on you, the stakeholder, who's knowledgeable on the ground, where the rubber meets the road, to bring us that data. If the cost profile this thing, in an existing building context, isn't the same as new construction, we got to know that. And that becomes part of the record and we make decisions based on that.

So, I really want to invite that conversation, that participation.

You know, anyway, I wanted to just make that comment really quick.

Tom.

MR. DOUGHTY: Well, I wanted to follow on Commissioner Peterman's thought on bringing solutions to the table.

Cynthia, you mentioned this concept of a creative alternative. You talked about consumers not

willing to bite off a 20-year commitment, or 25-year, whatever you said, Matthew. The fact is that owners and tenants are both struggling with long-term commitments.

Have you heard of solutions in other parts of the country, or the world, where creative solutions are actually making a difference in getting customers across that long payback threshold?

MS. MITCHELL: It's percolating and developing all around the country. And what it involves is transaction structures that work with, for instance, commercial building owners, to create a revenue stream based off of the savings achieved in that building over time, where you're able to have a strategic plan to go in and begin to reduce load and consumption.

And it doesn't happen all at once. But HVAC is a great gateway because you can do efficiency DR-enabled HVAC with storage, then you can start working on the lighting system, and on and on.

But the notion is that you have to be able to go deep and broad in a building to get, say, 25 to 40 percent savings over a few years, so that then you have a difference between what would have been the baseline consumption, otherwise, versus the metered data so that you can clean that data out to account for all kinds of external factors, and still have a savings base there

that's significant.

Then you start a pay-for-performance type of contract with the building owner, or a group of building owners, or an aggregated pod of residential customers, right, so that you're able to bill the customer or the building owner at something other than, possibly, their existing metered load. You can work with that savings range, it becomes a revenue stream.

You're essentially taking the Amory Levins' negawatt [sic] hours, and turning them into a commodity.

And so, TURN has a proposal, NRDC has a proposal before the commission in the IDSM proceedings. There's folks percolating up, all over the State, and nationally, that are vendors, consultants, entrepreneurs that are working with various forms of the AMI data, that are coming up with products that have this baseline counter factual metered data.

MR. HARGROVE: Can I add to that?

COMMISSIONER MC ALLISTER: Yeah, go ahead.

MR. HARGROVE: First of all, I want to point out that a representative of the commercial real industry to sit here and agree with TURN and PG&E, I'm very proud that that's happening.

But, also, we have a proposal, it being very similar to what was just discussed, and we have it

connected to AB32. Five years ago we approached the ARB. And we think that this is the type of program that can be applied under the existing AB32 structure. This would reduce greenhouse gases.

We, as a building industry, have even said we don't even want the credits out of any of this. We're not in the mandatory markets. We're happy to give up all of our credits to the local utility, who needs this type of stuff, if we can figure out how to work out this type of program.

It's very similar to, you know, I don't want to mention on-bill financing, but it's the same type of comment is figuring out how to move that delta to be smaller, bring the savings up front so you can have folks make decisions.

The common number that comes from my members, when we're talking about these things, is if you can get the return on investment down to three years, it's a no brainer, we're going to do it.

But if it hits five years, yeah, we're probably not going to do it unless you're forcing us to.

So, we're looking at a three- to five-year return on investment here, when your staff, who are writing these codes, are looking at a 30-year return on investment. And it's the reality and the theoretical

aren't there.

And we would love to see some type of program tied in with greenhouse -- and that's the other thing is we think a lot of this, the conversation gets mixed up because we -- especially with the AB350 conversation right now, in the Legislature, is does that mean building by building energy efficiency savings by 50 percent? Well, you're freaking out a lot of people who own newer buildings.

I think what we're really talking about is the statewide portfolio of energy efficiency savings and that's not clear in this.

And I think you would have a lot of folks who would be very supportive of the concept, who are very push back on it because they think they're going to have a regulator show up at their front door, knock on it and say, have you received -- have you got your 50-percent energy efficiency savings, yet? And they say, well, I'm a lead gold building that was built in 2008, I'm never going to get there. So, that's a piece of this.

And also, lastly, as we're talking about this, there's got to be a real recognition between plug load and envelope. And I think that's not something that we discuss a lot, and that's something that makes my members very, very nervous is that when you build a new

building that envelope, because of your code is extremely efficient. But the second folks move into that building, then there's other economic activity that's happening.

And that's a lot of our worry here is that the plug load issue is getting mixed in with the envelope load issue. And I think some of my members are worried that the State wants us to become energy cops, and start tapping companies on the shoulder and saying, you need to unplug all your computers at night. And we don't want dry cleaners in our buildings and things like that.

MS. MITCHELL: But under new transaction structures, then that plug load becomes a positive attribute of the building that the venture capitalists, the building owner, and the project implementers can work, then, also with the tenants to manage that load in a way that creates an asset that brings benefit to everybody.

I had a couple of comments, when it's appropriate on --

MR. RECHTSCHAFFEN: Excuse me for one second, Cynthia.

MS. MITCHELL: Okay.

MR. RECHTSCHAFFEN: Matt, you know, no one's ever talked, either at an agency level, at an

administrative level, in legislation about building by building meeting a 50 percent savings target.

So, I just want to -- I understand rumors abound. But just let's be very clear, no one's ever -- it's always been a large portfolio standard.

MR. HARGROVE: I understand.

COMMISSIONER MC ALLISTER: And doubling the savings, not having the consumption, right.

MR. HARGROVE: And, again, so I understand that.

MR. RECHTSCHAFFEN: Right, it's achieved doubling the rate of savings through programs at existing buildings.

MR. HARGROVE: Again, I understand that and I think a lot of people who pay close attention understand that. I don't think your average, even sophisticated building owner out there, as they're reading in the paper, understand. And I think it's a communications issue.

And I'm really glad that you're here to, you know, clarify that. But I get calls all the time saying, how are we going to make our building 50 percent more efficient?

And as you know, the legislation, as written, doesn't really go into that detail. So, we have to walk them through what the regulatory process is.

COMMISSIONER MC ALLISTER: So, I just wanted to highlight the fact that the plug loads are absolutely a big deal. They're highlighted extensively in the action plan. We had a workshop the other day about plug loads. And we've got a lot of good ideas about how we might help plug loads become more efficient, both through the Title 20 process and just through different market transformation types of initiatives. And again, data, data gathering, that kind of functionality, and communications kind of also came to the fore there. So, that's a theme that's ongoing.

But I agree with you, shell and plug loads, very different, very different dynamics, completely different markets.

CHAIR WEISENMILLER: A couple of things. I just wanted to follow up on Aaron's comment about leveraging smart meter data. And, you know, I wanted -- actually, I was going to encourage people in terms of written comments, again, to come forth with ideas there.

It strikes me as an area that's rich for potential pilot projects.

And I was going to start by indicating, when I first came back into State service, one of the projects that Lockyer was working very closely with PG&E on, was the notion of trying to go through the data, identify

the savings in State facilities, coming out of doing the retrofit, and then use those savings to secure -- to basically secure a bond issue.

And, you know, after several years of trying to, I think he threw up his hands and walked away, saying that buildings -- building system or other issues just made it impossible to pull off.

But again, if there's a way, with the new data, to really identify and use that to securitize financing, be it State or other opportunities, it would be fairly large.

So, I was particularly interested in Cynthia and Snu's reaction on ways we might leverage the smart meter data?

MR. PRICE: Yeah, I actually think that's also another way of answering Tom's question. I think energy service companies have been around a long time, with performance contracting, and financing investments in energy efficiency.

I think that the new thing, and kind of the crux is, you know, for a broader range of customers, other than sort of the institutional customers that have participated in that, is isolating, well, what is the savings attributable to -- you know, and get compensated in an assortment of cash flow stream to actually make

that ESCO model work for -- you know, for residential, for a broader set of commercial, industrial.

And so, it's really the smart meter, can we isolate, you know, how much savings I'm getting from this customer out of that, in order to create the cash register for energy efficiency, which would leverage the financing, which would allow this whole market to kind of -- without that piece, we're back into a model that we've tried before, in a lot of places and for a long time, and that gets difficult. Which is that, you know, just traditional ESCO model.

MS. MITCHELL: And I think the smart meter data is a big step of that, but it can't get us there unless you have a what would otherwise occur, the counter factual. So, we need to be able to take historic data, other building data and do, essentially, algorithm construction of load meter data to create that counter factual. And there's companies out there that are doing that. TURN's proposal and NRDC's proposal reference that.

COMMISSIONER MC ALLISTER: Great, thanks. So, I want to just take this a step further. So, this sounds like procurement that you're talking about, not necessarily the EE portfolio.

So, if we're -- you know, in a way, we've got

the LTP -- anyway, I won't get into that.

But, you know, if we're going to have a secondary market for these products, say, and go leverage private capital, and bring them to these projects, and have savings we can all count on, you know, the EM&V, which is essentially what you're talking about, in real time, using smart meter data, the evaluations of the counter -- you know, establishing a baseline and departing from that baseline, you know, that needs its own ecosystem of rules.

And maybe they're built into the contracts between some aggregator and each entity. Maybe we're talking mostly commercial, where we have bigger -- you know, not so much residential. I don't know, I'd be really interested in your thoughts on that.

But what is your kind of high level, but your thought on what that ecosystem looks like and how it has, how it could impose the right kind of accountability. You know, as opposed to the EM&V system that we have now?

I mean, it's not obvious to me that we're talking about anything that's all that more streamlined or more simple, but maybe it is.

MS. MITCHELL: Before you jump to what the ecosystem or the rules on something like that would look

like, we're desperate for the need for ecosystem of experimentation.

What's happened in LTTP, with efficiency to date, is still siloed solicitations and siloed contracts. In efficiency regulatory it's, you know, consumer investment uptake.

We have no experimentation with these new, cutting edge products and concepts of working with site-specific loads, doing bundled efficiency, and creating counter factual baselines.

That's why TURN and NRDC have asked for pilots in the efficiency, in the IDSM proceedings. Please don't jump in to try and regulate something that hasn't been tested and experimented with.

And that's why I said, we need to have experiments that allow for success and failure. You know, the problem is that I think that we're adverse to taking risk, and the risk is in, you know, staying with the status quo.

COMMISSIONER MC ALLISTER: Thanks.

CHAIR WEISENMILLER: Let me do another follow up. So, Aaron talked about evolving the cost effectiveness test for EE, and it seems like it would be good to have some discussion, particularly between you and Snuller on what you thought -- or where the

evolution should be.

MR. PRICE: Well, I'm happy to do that. I mean, I guess I didn't respond exactly to Aaron's point. But it seemed to be implying that you're thinking the program administrator test is kind of the way to go.

And I'm more of a traditionalist on the total resource cost test, recognizing we have the portfolio, you know, it's the TRC for the whole portfolio. I mean, I think that gives a lot of flexibility in there.

So, I don't know where I'm going with that, but just to queue up your question, you know, it seems like there's a way but --

CHAIR WEISENMILLER: So, what were you thinking? And, Cynthia, what's your reaction after he says that?

MS. MITCHELL: Well, and I did include some end notes on my Power Point, on this, because I agree with Snuller that it's you don't throw out the cost effectiveness methodology.

And there's a long history that's been tested in California, and not just California, but around the country and the world. Because you've got to recognize that your 1980's standard practice manual has been adopted in -- you know, nationally. And most states operate under a total resource cost test for good reason. It is the comparison of what otherwise would be

spent, it's that long-run avoid cost.

Now, the fact that there might be some measures that are not getting an incentive, you said the more expensive ones, we need to be looking at that specifically. And is the whole measure, as you're describing it then, the utility and the customer's total cost of that. What you're describing is something that exceeds the long-run avoided cost.

And then, for the utility to offer an incentive for something that it would be cheaper for them to go out and get on supply side, that goes against the whole nature of efficiency, to begin with. And we need to be looking at how do you bring that cost, of that specific technology down so that it is a packaged resources, if that's truly a niche in the market that needs to be filled.

And one of the things that we're not paying enough attention to, I believe, and this goes to the point about, Cliff, your point about free ridership. You know, the deviation between reported gross savings from the utilities, and then the adjusted net, when you look at the 2010-12 EM&V, it's 50 percent. It's not all the free ridership.

But we have that big of an adjustment in the existing portfolios, okay. Which means, generally

speaking, that a lot of what we're doing in efficiency is just sort of following the market. The fact that, you know, the majority of the savings are compact and linear fluorescents, those are not cutting edge lighting technologies.

So, when we talk about, for instance, what would to-code get us? Well, to-code's not going to get us a lot of savings all of the sudden, okay, because the utilities are already getting a lot of savings counted from codes and standards. A third of the portfolio savings, now, are from codes and standards. And that's at the lowest cost you can get and it's just a pass through on the ledger and counted as savings, okay.

And the proposed goals now take that up to 50 percent codes and standards.

What we'd get to do if we went to code, and TURN has supported to-code baselines as a general construct, or concept, is that we get to go to to-code and beyond. We get to go after the harder, more costly measures and activities, and operations. We get to go to to-code and beyond whole building systems. We get to go to highest quality. And we get to go to quality installation and maintenance.

And so, in other words, the advantage of to-code and beyond is then to go and realize savings that are

otherwise, right now, paper transactions. But that's going to raise -- all other factors equal, that's going to raise the cost of these existing portfolios, okay. And these existing portfolios are struggling to be cost effective.

In our analysis, TURN's analysis in the EE proceedings, just recently, we believe the current portfolios are not cost effective. And we've submitted on the record to that effect.

So, you know, there's to-code would be great. We think, particularly, probably in HVAC. Just horrendous problems there. But it's got to come with a lot of creative design and implementation.

It's not going to just give us, all of the sudden, a big float in our savings.

COMMISSIONER MC ALLISTER: I want to ask Aaron, and maybe get Snu and Cynthia's reaction. But we -- so, the utilities both do codes and standards development work, and then do programs to try to get people to do stuff.

And you're arguing that you want that second bucket to include more to-code. So, have you thought about how much savings on the code -- from the codes and standards activity, itself, would you be giving up in order to then capture some of them in the voluntary

program side?

MR. JOHNSON: So, since I've got the mic, I'm going to jump back. Can I finish with one thought on Chair Weisenmiller's comment, which is, you know, when I look back at the participant test, one of the things that I look to and where I've cut my teeth at PG&E, on the customer side of the business, has been in residential solar.

And we are -- customers are bringing, and third party, the entities, are bringing a tremendous amount of capital into that. If you actually did a TRC on residential solar versus the avoided cost of the utility buying utility scale solar, it wouldn't pass.

But we're accessing that money and it's revolutionizing our business, certainly in California and definitely in places, like Hawaii and Germany.

But I think, you know, we're evolving in EE, we're doing revolution in other places. Some of the stuff we're talking about doing with some of these future EE goals is going to require, probably, a little more revolution, not just evolution. So, I think that's where I'm leaning on those tests.

I don't, certainly, have the history that Snu has on this, and I would defer to him in many instances. But I think we need to look at how we just capture that

same kind of capital that's been captured on the DG side of things.

So, after that, I've forgotten your question, so I apologize.

COMMISSIONER MC ALLISTER: Yeah, no worries. So, I guess I mean -- so, I'm going to comment on what you've just said and Snu can -- we've got a thread over here somewhere.

(Laughter)

COMMISSIONER MC ALLISTER: So, people make investments for lots of different reasons. And, you know, we can talk residential, commercial, whatever, and they're doing it for all sorts of reasons that include non-energy benefits. And they may get windows that are not cost effective from a straight energy point of view, and they're investing a pile of money because they love them. They make them more comfortable and they make their house look better, et cetera, et cetera.

So, at times I'm mystified as to why we would include the global cost of that upgrade and judge to project only on its energy benefits, when that's only really a small sliver of the decision. So, I think we have to -- you know, you said in your presentation, Aaron, that we're sort of warning customers not to make non-cost effective investments, and that's kind of how

we're capping this thing.

Well, you know, I think we're -- we want to encourage them to make those investments. Why are we second guessing them, in their own decisions, when they're doing what's in their own best interest and we can, by the way, capture some energy efficiency savings. So, mobilizing those projects is a good thing, not a bad thing.

But I guess my question to you was, you know, the utilities --

MR. JOHNSON: Giving up the energy --

COMMISSIONER MC ALLISTER: The utilities invest in codes and standards development, and then those become -- you know, we adopt some outcome of those. Those influence our -- you know, they go into our proceeding and we use them in our decisions, and the utilities then get some credit for having helped developed those, I think, in their overall -- you know, you get granted some upside for that. So, there's attributed savings there.

So when we talk about, then, going and accessing to-code savings on the program front, in another part of the portfolio, necessarily you're going to be giving up some of those initial savings, and have you guys thought about that?

MR. JOHNSON: Yeah, and I don't have an exact number to give to you on that right here. We're very proud of the work we've done, you know, working with the CEC on helping develop that evolution of code, and we take great pride in participating in that process. And we recognize that there are some savings that come from that.

It would be easier for us to, frankly, operate under the regime we have today, where there is some imputed assumption about what that uptake of code is. But, you know, what we think we're giving up by doing that, we're getting in the simplicity that comes on the other side, of using meter data to figure out what those savings are.

And, obviously, when you go there, there's some transition of baseline that you have to calculate. But once you've made that transition, you know, then we're accountable for delivering those real savings and we're not making all these assumptions about things that may or may not be occurring.

And so that's why, to really tackle that issue, we feel like you really have to couple it with the meter data, as well. So, we recognize that we're giving up something, but we think that, you know, it will make us more accountable for the programs we administer, and

make it more transparent and easy for us to figure out whether we're being successful or not because we sort of -- with some aspects of the after-the-fact review behind us, we'll have much more real-time data.

COMMISSIONER MC ALLISTER: Have you talked to your forecasting people about this, you know, where you think those savings actually lie, whether it's in codes and standards, and the conversation we were having before or whether it's something that's just completely unaccounted for, or what?

MR. JOHNSON: You know, I don't have the graph right in front of me. We've looked at it about -- it's across different technologies. And so, we think it's pretty spread across sectors and different technologies. We didn't identify something that is the sort of silver bullet of that. And we can submit, in our comments, we've done some data on that. I just don't have it off the top of my head, but we can submit that as part of our comments.

MS. MITCHELL: Well, Navigant has a study underway on baselines that's supposed to be digging -- ferreting out some of this information that you're asking for. And I've forgotten what the date is, due date on that. You're not working on that?

MR. PRICE: No.

MS. MITCHELL: Oh, you're with E3, I'm sorry.

CHAIR WEISENMILLER: Actually, I think this conversation is good, it really lays -- it helps us segue into market transformation, so let's move there, now.

COMMISSIONER MC ALLISTER: So, I just got a big pile of blue cards and I guess I'm going to -- we're at 3:15, which is I think where the panel was supposed to end, anyway. So, let's segue to the next panel and we're going to do all the blue cards at the end, at this point.

MS. RAITT: So, the first speaker on the Market Transformation Strategy Panel is Talbot Gee.

MR. GEE: I keep drawing the short straw.

COMMISSIONER MC ALLISTER: You again, go ahead.

MR. GEE: Right. Well, I'm going to use by bully pulpit here as the transition between the two. Because, first off, market transformation, I think anyone else who's ever heard me speak on this topic knows that I get a little bit of a twitch when I hear "market transformation". It's thrown around there a lot. It's become a very casual term.

But I'll tell you, from our perspective, or what we view as the industry's perspective, it's always about what's wrong with us. It's always about transforming

us. Even the big, bold strategic plan, talks about transforming the HVAC industry.

Well, you know, we were kind of here before all this kind of stuff, and we're expecting to be here long after. But we're just one piece of this whole thing.

And this idea that market transformation excludes this entire machine or infrastructure that is all of this discussion, energy efficiency, baseline assumptions, all that sort of thing, is somewhat offensive, I think, frankly, to people who make their living in this industry, installing these products or providing these solutions.

I'm glad this is the last discussion because my comment to Jeanne, when she called me about this, was this looks like a very fragmented agenda, with a lot of bunch of silos, when all of these things are intrinsically connected.

How can you have a conversation about new technologies over here, but then market transformation over here, or codes and standards over here and market transformation here.

Where we're at right now, to put it bluntly, is this current environment, in my opinion, creates a rather adversarial relationship between multiple parties in the State as it relates to energy efficiency.

Everyone's kind of arguing and they're in their fox holes, right, and no one wants to give an inch because they're afraid of the mile being taken from them.

And where does it leave us? It leaves us with very mediocre energy efficiency results in the big picture, in terms of cost effectiveness, the efficiency of dollars spent in all the programs. And then, I'll tell you from the Trade Allied perspective, a ton of frustration. Because it's very time consuming to interact with efficiency programs. And, frankly, to very little benefit.

And this is not just California, although I will say California is maybe a hyper example of this.

But across the country we did a survey, and a research project years ago, 70 percent of our members could not attribute a significant business benefit to cooperating in energy efficiency programs. And that's a scary number because we like to think, as an organization, we've been very proactive getting out there and trying to help programs, and connect members to programs. But they're seeing no business impact to it.

So, if you're a business owner are you going to keep doing it? Does it make sense for you to do it?

This adversarial relationship is a big reason why I don't think we've achieved these market transformation objectives.

I will tell you, industry has a lot of market insights, and a lot of data, and a lot of -- a lot of information about what's really going on in the marketplace. But I will tell you, at least from our perspective, we're very, very guarded about what we do with that because we don't know how it might come back to bite us in the future. Because we don't feel we have a great partner, necessarily, with all the powers that be. Rather, we are taking more defensive postures oftentimes, just making sure something really bad doesn't happen, rather than achieving something excellent, right.

The WHPA was an effort to achieve market transformation. That's why it was created. It was to bring the industry stakeholders in and to create a more positive environment between industry stakeholders and all of the energy efficiency infrastructure in California.

There's been a lot of great things that have come out of it, a lot of great relationships and discussions that never would have happened otherwise. But I'll also tell you, there's a ton of industry

frustration, too. Because every time we start thinking we're talking about something cool, there's something about a TRC or a cost effectiveness measure, or something we don't understand that says why we can't do it, right.

And we're asked, what do you need? So, we bring together members, who devote tons of time, and lots of information and data, and they say, these are the markets we're having trouble penetrating. No matter what we do, we can't get high efficiency, central AC systems above 16 percent super-efficient, or high-efficient. That's what we want to focus on.

And the answer is, well, no, that's not efficient enough to pass our TRC. We need you to get to, you know, leading edge technology.

Well, we can't even get people to what's currently available right now. So, why spend time doing that? That's an inherent barrier.

We'd like to push an idea, similar to kind of the smart meter concept of saying, look, we can tell you with a pretty high certainty what, for example, the volumes and SEER mixes are of systems installed in the State, right.

Why not challenge us or let us submit a challenge to improve that by some percentage and we're

incentivized to do that, right.

So, we say, okay, we think if we can get a budget of X, we can turn this market by five percent. I'm throwing it out there, you know. And just let us go for it and if we screw it up and don't do it, we'll never get the change again, right, until the next time around. But at least give us a chance.

Instead, we spend a lot of time creating a very articulate argument about all these opportunities, and all this sort of stuff, only to find out it won't pass the TRC.

So, then we couple this with standards, right. So, we are dealing with increased standards on water heaters, increased standards on central AC, increased standards on air source heat pumps. Eventually, increased standards on residential gas furnaces.

Well, guess what, across the country, in other parts of the country, that's eliminating portfolio TRC cost effectiveness by eliminating products that were once heavily, heavily favorable to their portfolios, like water heaters and furnaces.

Now, if the minimum standard goes up, there's no estimated savings because the assumption is everyone's just going to go flock to these new water heaters. You lose all of that cost effectiveness, those savings, and

you can't subsidize the next emerging technologies program over here.

So, this whole concept of portfolio becomes a huge handcuff. And frankly, again, it's all built on the assumption that just because a legislature, or a regulatory authority, or the Federal government deems it so, that the market, automatically tomorrow, will do that.

And we can tell you that's not what happens. We had the most massive depression in our industry, in terms of unitary sales, after the effective date of the 13 SEER minimum standard in air conditioners.

It was a 40 percent drop in this State, alone, in terms of volumes, when that happened. We are barely -- we are not even back to where that line would have been now, even after a few years of some stronger economic environments.

So, who pays for that? Well, frankly, not the State. The people who are living in that environment here.

So, when we talk about market transformation, I'll kind of summarize it up, I said, why do we view this, again, as trying to predetermine outcomes that no one can really, truly predict?

Why don't we treat it more like what your State

University system does with research projects. You don't commission a research project and mandate the outcome, right.

You commission the research project based on the hypothesis of what you think you might learn. But the whole point is, oftentimes your hypothesis is wrong, and you learn something new, and you do something better the next time.

Why don't we do the same approach here, with energy efficiency? Why don't we do it as challenges, our bounties, or whatever the case may be for hypothetical savings opportunities, unleash the resources to do it. And if the deliverers can't do it, then you have to take another swipe at it.

But we shackle ourselves, you know, we are heavily involved in this residential upstream program, which was targeted at distributors, incentivize distributors to stock and sell higher efficiency central AC products.

And we can back with a very detailed recommendation list of what we needed that program to look like, with very accurate incremental costs, by the way, which is a touchy subject among my members. But they felt the "squeeze was worth the juice on that one". So, they gave a lot of data there to do it.

And what we got back was, yeah, these things would be great, but they don't fit into our current calculations. So, you can do this at the super max tech, but only in these little areas. It's just not cost effective from an industry stand point to do that.

So, we had an opportunity there in what I thought to be kind of transformative in the way we design and implement a program, and you got very real, raw feedback from members of the industry, contractors, manufacturers, distributors, a every extensive, detailed proposal, and everything that everybody from industry -- that the industry wanted got gutted out of the program.

And as a result, to my knowledge, it's really gone, basically, nowhere since. So, that was a lot of time, money and effort that was spent by the State, by the utilities, by all the powers that be, to basically no outcome.

When we think we would have done better by saying give us a challenge, take a little risk, but we think we're going to deliver even more than maybe what the immediate assumptions might have been.

So, that being said, you know, I wanted to stay positive with the fact that we want to partner and work with this, but the current infrastructure makes it extremely, extremely difficult to do so. Thanks.

COMMISSIONER MC ALLISTER: Thanks very much. And I want to encourage you, whatever documentation you had and whatever sort of thinking you had done, if you can submit it to this record or, you know, I don't know what process or record you were talking about. I don't think it was in this Commission.

But if that -- you know, that's exactly the kind of collaboration that I think we all want and we want to, now, put our thinking caps on and see how we can move the ball forward.

So, you know, I certainly sympathize with the boots-on-the-ground perspective. So, thanks for that.

CPUC COMMISSIONER PETERMAN: I'd just like to also clarify, too, as we get into the discussion, that I think we all see -- when we talk about market transformation, see it about ourselves, as well as any industry entity, as well.

Because a lot of the discussion, I think what we're going hear from next is a focus on, you know, how do we set ourselves up from a regulatory model to facilitate that type of engagement that you've mentioned. And so, the finger's pointing inwardly, as much as outwardly.

MR. GEE: To Jeanne's credit, that was the argument that got me to fly 2,300 miles here.

CPUC COMMISSIONER PETERMAN: Well, welcome.

COMMISSIONER MC ALLISTER: Well, definitely. I think we're both --

MS. MITCHELL: Out of his own pocket.

COMMISSIONER MC ALLISTER: Well, thank you. We're both in that boat, actually. I mean, in the code discussion before, you know, I think the last panel, I think we see that there are solutions that we need to come up with. Not just in the program environment, but also with how code gets applied to these buildings.

CPUC COMMISSIONER PETERMAN: But keep challenging us.

COMMISSIONER MC ALLISTER: Yeah, absolutely. I'm not going to ask you about the tracking system for HVAC units coming into the State. You said we needed more information about that, so that's right there on the table.

MR. GEE: Yeah, quid pro quo, yeah.

COMMISSIONER MC ALLISTER: Okay, great.

So, who is next?

MS. RAITT: Next is Susan Stratton.

COMMISSIONER MC ALLISTER: Susan, yeah. Great, go ahead. Thanks.

MS. STRATTON: Thanks for inviting me to represent NEEA, here at your workshop. So, I appreciate

it, Commissioner McAllister, and the rest of you who are here.

Because I am from out of your territory, I'm here to tell you how I think -- why I think market transformation programs have been a success in the Northwest, and mention a few key attributes of how we do it, that might be helpful to you. I'm not sure I can solve all the HVAC problems that you've seen, or we've just heard about. And my one example I'm going to talk about today is not HVAC, so I don't know if that's good or bad.

So, I'm going to provide a broad perspective on the Northwest, and I hope you'll find some good takeaways that might be helpful going forward.

Go ahead. Let me say that I want to scale back about 20 years ago, and when we were maybe at the same place you are here, and thinking about the original hurdles, organizational hurdles that we faced in 1996. And so, the conclusions by the founders and the regulators, as NEEA was created, were these.

So, the funds for NEEA, as a market transformation organization, had to be allowable expenses by the regulatory bodies, which are not just the IOU regulators, by also the public utility regulatory community.

The Alliance had to operate in markets that crossed state and utility service territory boundaries. We needed to be voluntarily funded, through an equitable funding formula, for all of the utilities in the region.

And in the beginning, those were just electric utilities. And I'll fast forward and the good news is, just starting in January of this year, we've added natural gas.

Our work had to be regularly evaluated and our success needed to be judged on a longer-term horizon. We regularly use a 20-year planning period to analyze our results.

And we had to prove that market transformation could be replicated and result in sustained, measurable market change. And I'll give you some examples of that in a few minutes.

So, fast forward to today, we're almost 20 years out. We're in our fifth funding cycle. We're funded in five-year increments by this group of folks that you see here. And you'll see sprinkled in there are a few natural gas, only, utilities. We just did our very first funding cycle with natural gas.

So, NEEA's been the catalyst for market transformation in the Northwest. But it's these funding organizations and their staff who are dedicated and

passionate about working together on energy efficiency through their resource acquisition programs, and through the alliance of all of us working on market transformation. Which I'll talk about in a little more detail in a minute, but also includes from emerging technologies, all the way through code work, and market monitoring long after we're done being involved in the market.

So, just a quick snapshot of the NEEA funding today. One more slide. We have a rather complicated formula, but it's one that everybody agreed on. And this is where our funding comes from. Bonneville Power represents about 130 public utilities, and Energy Trust represents the investor-owned utilities in Oregon, and then on down through the smaller utilities.

So, we have our two largest funders being -- representing indirect funders of NEEA, and others as you see there. All of the direct funders of NEEA have a seat at the NEEA governance table, and I'll tell you a little bit more about that in a minute.

Let's go to the next slide. So, in a nutshell, for this funding period, 2015 to 2019, this is our total funding budget, $169 million for electric and about $18 million for natural gas.

NEEA represents about 10 percent of the utility

investment in energy efficiency, and we deliver about 20 percent of the savings in the region.

So, the success of NEEA is based on the sustained ability to create the economies of scale that it takes to move those markets. We have both economies of scale, we have the ability to leverage markets that individual utilities might not have. And we also have something we call risk pooling. As we're looking at new technologies in the market, we can test those technologies.

And let me tell you, we've found some duds and thrown them overboard. And sometimes we found the duds a little bit later. But it was just NEEA that had the clean up to do, rather than each individual utility.

So, many of the products that are involved in utility resource acquisition programs were first tested and piloted by NEEA in the field, and evaluated by third-party testers.

But let me talk for a minute about our governance. The governance is by our funding utilities. And I think this is key to the sustained voluntary funding and continued collaboration.

So, the public representation is also there, as you see in four state representatives and a public interest representative. But, primarily, the board

governance is by the funding utilities.

This is something that every five years, as we recreate our funding plan, we wrestle quite a bit with finding the sweet spot that makes all of the funders happy and want to come back, and sign a contract with NEEA.

And I know my predecessor, Margie Gardner, is here and we chatted a bit just before that. And I don't think it gets any easier every five years. Every five years, situations will have changed for each of our utilities, some needing peak, some not needing peak, some having a desire to meet all of their load growth through efficiency, and some having excess capacity.

So, finding the sweet spot of what market transformation can deliver to 145 utilities is about a year-long process, as we wrestle with the kinds of markets, and each sector, the kind of research that we might do.

But in the end, we had a successful planning process and all the utilities, with the exception of one small one, resigned to be a funder of NEEA going forward.

Now, you might ask, you know, what do the regulatory commissions have to say about this? The regulatory commissioners leave it to the utilities to

come before them, to prove that they're getting all of the cost effective energy efficiency in their integrated resource plan.

Most of the commissions and their staffs are encouraging participation in NEEA, but none absolutely require it. So, that's why the utilities, you know -- if the utilities volunteer to support NEEA and participate in the governance of NEEA, then we have a really tight alliance that works quite well together.

They feel ownership. When we say alliance, we don't mean this company in Portland, Oregon. We mean all the utilities that are participating in NEEA. So, NEEA is just this little company, but the alliance is all of us in the four states.

We also have 85 staff in Portland, but we also depend not just on our utility partners, but contractors and market partners for special expertise, and field work, and third-party evaluation of all of our work.

Okay, the next slide. And a little bit closer focus on our governance structure. I'm the Executive Director at NEEA. And, as such, I report to this board of directors which has about -- it has five board committees.

But beyond that, we have a number of advisory committees by sector and function. And those are

advisory to the staff and the executive director.

We've also, very recently, given one of those advisory committees, the Regional Portfolio Advisory Committee, some governance role in the forward movement of our initiatives. So, there's a number of stage gates, two stage gates where that Portfolio Advisory Committee will look at our theory of market transformation, decide whether this is worthy to move forward and to continue investment.

So, this is really given a lot more participation at a lower level, below the board, and it's really increased. Actually, it's increased the engagement of our funders going forward. And this was really a condition of moving forward with our new funding model, and we're all really pleased with how that's worked out.

Okay, the next slide. And now, I'm going to start to show you the spaghetti diagram. I will say it takes a whole region.

If any of you have seen Tom Eckman, of the Northwest Council, any of his presentations, he'll quite often shown the spaghetti diagram of the northwest collaboration. And this is just a tiny speck on his diagram where -- and I'm sorry, I didn't mean to show myself as the center of the universe here, it just

happened that way.

I do report to a set of directors. Advisory committees report to me. Every five years we take all of this input, and all of the work that we do together, and reset our plans.

And on an annual basis we have operational plans and we have quarterly reports to those board members.

You'll notice we do not see the regulators on here. We do not report to regulators. We report to utilities, who report to their regulators. And that's important, the utilities value that relationship with the utility. We stand behind the utilities. We give them data and information to support the savings that we've achieved through market transformation. And they're the ones that file that to the regulator.

We do have relationships with the regulators. We serve as a source of information, when called upon, but we do not have a regulatory mandate as NEEA.

We also work pretty closely, you'll see up in the right corner I just have "region". That includes our council, it includes our regional technical forum, state government, et cetera. But we're very closely involved with them as they create -- for example, as the council creates the integrated resource plan for the region, and also with the Regional Technical Forum.

So, I will say that the regulators do support the funding of NEEA, by the utilities, as long as the long-term results are cost effective. So, it's the long-term NEEA portfolio that's viewed by the regulators in terms of cost effectiveness.

I think that's it, next slide. So, I guess I should have started with this. I know, I heard Talbot say, oh, market transformation, you know what are we -- well, what does it really mean?

We have a very specific definition that we use and people may use a different one. This is the NEEA one. It's the strategic process of intervening in a market to create lasting change.

And that's really just a lot of information packed into that. So, let me show you a picture on the next slide. And go ahead and push the -- there we go.

What I want to show is this is a typical S curve that you'll see, representing market share over time. This could be for any product. But as NEEA determines where we might remove barriers, we shift the curve up and to the left. So, the baseline is that lighter grey line on the bottom, what would have happened without NEEA involvement or Alliance involvement, and the movement that we can make is that upper line. And the area between is how we measure market transformation.

As we begin to work in a market you'll see, you know, in the early adopter area the dollars invested by NEEA are pretty high. There's no savings coming out, yet. And as we are able to accelerate through the market, we may hand off. The utility may take the product for a resource acquisition program. NEEA will continue to monitor and be involved in codes an standards at some point in the market development.

But through this process, we're always gathering information on our field tests, working with our trade allies to understand how new technologies are working in the market so that as we sit at the codes and standards table, we can say this is how it's working in the Northwest.

If we look at our entire portfolio in our last business cycle, our levelized cost over that cycle was 1.5 cents per kilowatt hour. So, very cost effective working on this broad market approach.

The next slide is another just quick picture of how NEEA works. And I also want to compliment Ralph Prahl and Ken Keating's paper that they submitted in December. And they have a much longer explanation of how market transformation works and I think they did a really nice job.

This is just, you know, in a quick nutshell, we

identify barriers that impede market adoption of products, services and practice. So, we're not just looking at technologies, but the broad array of services and practices, as well.

We look to see where NEEA might intervene to remove a barrier. If we can't find a way that makes sense for NEEA to do it, we won't take that product any further.

And then, finally, the market is transformed as that barrier is removed. Someone asked earlier, how do you know when the market's transformed?

And again, I'm going to call on Tom Eckman from the Council, because he has a great way to describe it. And he says, "A market is transformed when it's" -- "Technology is transformed when it becomes illegal, immoral, or unprofitable to continue to that technology". And, obviously, he's referring to codes and standards, being wasteful, or you're not having a business process that's efficient. So, I kind of like to use that.

So, let's talk, let's use an example so I can make this a little bit more real, on the next slide. Let me talk about where NEEA and California utilities work together on market transformation.

Together, the California utilities that we

worked with, and NEEA, represented 19 percent of the U.S. market. That's just enough for market leverage with large retailers.

So, in 2009, we knew that customers were on the verge of changing from the tube-based digital TVs to digital TVs, and energy efficiency was not a factor. Most TVs had an Energy Star label, but beyond that there was not much differentiation.

So, on behalf of the Northwest utilities and ratepayers, we joined forced with California utilities and we were offering retail buying groups cash incentives for stocking and selling the most efficient TVs.

Together, 19 percent of the U.S. population got their attention. The amount of money we paid was very, very small. The success in the market was that, you know, over a short period of time, now the average television in the Northwest used 60 percent of the energy of an incandescent light bulb. The Energy Star specs are more stringent than in 2009, and every TV on the market is more efficient than our first incentive tier.

So, we're pretty proud of this. You know, we had some great results and I think the cost effectiveness of this particular initiatives was less

than a penny per kilowatt hour.

MR. RECHTSCHAFFEN: Susan, can I just -- how long did the program last until you -- how long did you provide the incentives?

MS. STRATTON: Next slide, let me just go to it and you'll see. This is really a picture of that S curve. So, as we provided incentives for about four years, and each year we rolled up to a higher tier incentive and really squeezed those incentives pretty small.

So, we got out of providing incentives in 2014. And so, again, here's the real S curve from what we measured. And this is a very quick initiative so that we saw the market transform to a higher market share very quickly, and leveling off, you know, in 2019 [sic] to about where it would have been without our intervention.

But we were able to capture that opportunity when people were changing out their TVs. So, this was one of the more quick moving initiatives that we did and most successful.

Heat pump, hot water heaters, on the other hand, will be one of the longest term investments that we will have made, just in terms of being involved.

But this one is a good one to show kind of a

quick win in a pretty interesting, short S curve.

COMMISSIONER MC ALLISTER: Susan, could you sort of chime in or make clear where the minimum performance standards kind of kicked in? Like at some point in there, in California, we adopted Title 24 standards for TVs.

MS. STRATTON: We were using Energy Star tiers. And, you know, I can't remember exactly where we started. But each year we would have a higher level of Energy Star performance. So, I'm not sure, you know, how it lined up with --

COMMISSIONER MC ALLISTER: Well, just thinking in the S curve kind of dynamic, where you've got early, you've got voluntary adoption, early adopters, and then at some point you end up with a mandatory standard that says, okay, everybody's going to be above this minimum.

And do you have sense that there was an interplay there at all? Sounds like maybe not.

MS. STRATTON: Well, in a sense, the market share of Energy Star versus, what was it, 5.3 is 95 percent at the end of 2014.

You know, I think, some of the utilities have asked us, well, would this have happened anyway? We would have lost kind of that acceleration of -- because we moved the incentives during the period. So, this

really represents the broad, kind of broad TV market.

COMMISSIONER MC ALLISTER: Okay.

MS. STRATTON: And most of this was big box stores, which represented about 85 percent of TV sales in the Northwest. And it could have been a different number in California, but that's where it was in the Northwest.

COMMISSIONER MC ALLISTER: Great, thanks.

MS. STRATTON: Okay, let's go on to the next slide. I want to just give you a quick view of our entire portfolio. And not to focus on everything in there, I want to make three statements.

The first column is what we call our scanning portfolio. These are all the things that we're looking at and determining whether there is a market transformation play.

You know, we know that we've got to have about three or four times as much in there as we could possibly test and move through, because we're going to look at it and say, not a role for NEEA, and too early, too late, market moving too quickly. We're going to find the right things that we can move forward.

So, we call this our pipeline. We need something that's at or near commercialization, understanding if there's a barrier that we can remove,

and can we do that cost effectively.

I'll also point out, in the middle you'll see some C4 discontinuations. That's our cycle four. When something gets to a certain point in the portfolio, we're testing constantly, and if we don't see that long-term cost effectiveness, we're going to toss that out of the portfolio.

So, that's a summary of over the five years before of things that we had already started moving through and then we cut, we tossed it out. We weren't going to be committed to those for the long term, for different reasons for each one of them.

I also want to mention, in the market development column you'll see building operator certification expansion. As I was reading Ralph and Ken's paper, they pointed out building operator certification as a NEEA success in 2002.

What we found, you know, as we continued to monitor that program, was that there was a new barrier that we'd become aware of, and that was the time to travel to training.

We have trade allies in Montana, Idaho, you know, they may have to drive 12 hours to the nearest BOC training. So, there was the need for some online portions of this training. And so, we went back into

that same market and invested in some online development for that.

So, as an example of an initiative we worked on ten years ago, we saw a new barrier, we brought it back and we adjusted that barrier, and we're just finishing up with that this year.

So, that's just a quick peek at what our portfolio looks like.

The final column, you'll see TVs on the top, these are things that we've gotten out of active involvement, but we continue to measure the market movement along that S curve, so that we can measure those savings associated with being involved in those market.

And I just want to end with a picture, on the next slide, of the power of our regional partnership and the power of our alliance. This is a cumulative view of our total regional savings. And I think it does a good job of showing kind of the length of time, if you look at cycles one and two, which was 1997 to 2004, we're still measuring, you know, small, incremental savings from those markets in 2014.

And the cycle that we just finished, cycle four, those savings are just starting to rev up in the market and you'll see those grow in the coming five years.

But together, on the initiatives that we worked on at NEEA, along with our partners, utility partners, we've saved 1,100 average megawatts. Obviously, two large power plants. We believe we've been successful in working together.

We're really proud to show this chart, to show what we've done together. But also recognizing in the very beginning years, a little bit lean in terms of savings.

So, starting up a real complete market transformation operation requires some understanding of that investment and building of a pipeline so that over the years, over the future you'll have those new technologies to kind of feed the savings that will come later.

Lastly, when people as, you know, why an alliance? I think I mentioned this a couple of times throughout. But I want to make sure that you know that our funders believe that the Alliance provides three important things, market leverage because of our size, economies of scale, and risk pooling. And we're successful because the NEEA savings in the utility portfolios are cost effective, we take a long-term view, and the funders participate actively in our governance and feel ownership of NEEA. And so, it makes us a large

alliance, rather than a small, nonprofit in Portland, Oregon.

And that's all I have, and I look forward to questions and discussion. Thank you.

COMMISSIONER MC ALLISTER: Thank you very much for being here, appreciate it.

Linda Derivi. Get the green light to go on and you're set. There you go.

MS. DERIVI: There we go.

COMMISSIONER MC ALLISTER: There we go.

MS. DERIVI: Good afternoon, Commissioners. Thanks very much for the invitation for being here today. I look forward to telling you about the transformation of my profession.

The American Institute of Architects California Council represents 23 chapters of architects throughout California. We represent 11,000 members, students, emerging professionals and licensed professionals.

I've been a licensed professional since 1976. Took my architect's education at UC Berkeley. I am also a licensed building contractor and certified interior designer.

My husband and I owned a firm, in Stockton, California, up until several weeks ago, when we sold it, preparing for our retirement.

At this time, I serve as the Director for Design and Practice at the AIACC.

I reflected on market transformation a couple of years ago. My focus at the AIACC was to be an interface with our member architects. We have a great staff there, but no one else was an architect. And I've lived that life. I've lived the life of a professional who depends on artistic and technological pressures, and inspirations to do my work for my clients. They've ranged from Kaiser Permanente, to about seven different school district, and University of the Pacific, in Stockton.

Market transformation for the architectural profession, I believe, is being pressured by four different elements. Some of them are inevitable, some of them are things that have come along through the economies changed.

The first pressure has been the economy. In 2008, the downturn in the total national economy really hit the architectural profession. And I would say that probably, at one time, there was at least 33 percent of architects across the country that were unemployed.

And as recently as a couple of months ago, I was in the position of interviewing architects to hire at our firm in Stockton. And I believe I interviewed five

experienced practitioners, who had been without work for several years. And these are people who would fit into many different firms, but their positions were no longer available to them.

So, the economy has taken its toll on our profession. There's a lot of talent out there that could be tapped to help with energy efficiency of buildings. After all most of us attended schools of architecture that were within colleges of environmental design.

And I say that often to people because they don't quite understand the interface of architects with the natural environment. But we consider ourselves stewards of the natural environment and, therefore, strive for efficiency of energy, water, and resources.

The second element that is affecting us, and it's affecting a lot of professions right now, is the Baby Boomers moving on. I'm myself, one of those. And it's a generational transition, which is interesting. And I've looked back on my own life, to ask myself the same question, was this going on when I became an architect, when I first came out of school and entered my profession?

Generational transition brings a lot of opportunities. Our students are learning much more

about technology, CAD, BIM. If you've never heard of those, those are becoming everyday words in architectural profession. They are bringing us a lot of utility to design, but they are continuing to be a challenge to a lot of older practitioners.

Now, maybe those older practitioners are moving on, but they're still in a position of hiring students out of the universities and, often, they're perplexed by what talents those young students, graduates are bringing to their firms.

The third challenge is technology, itself. And we started out, I think in my career, I learned how to hand draft. And then along came computer assisted drafting and design. And now, within the five to eight years, we are now experiencing the use of BIM, Building Information Modeling.

This has its own challenge as far as expense, as far as education, as far as being a real hurdle for a lot of very small firms. And most firms in California are smaller firms. There's a big difference between the big firms that operate in Los Angeles, and San Francisco, and the many practitioners out here in the valley. We have much different portfolios of work that we do.

But as Talbot described what he does as the

rubber hitting the road, architects are in the same position.

The fourth challenge is climate change. And this has been something that was predicted from the time that I was in college. That manmade pollution and extensive use of greenhouse gases was going to bring us to a point that would threaten the overall environment of the world. And so, here we find ourselves with this.

The AIACC, within the past two years, has adopted a policy advocating for energy, water and resource efficient design.

The issue with this, in thinking about all four of these elements, they may all be challenges, some may think them insurmountable. But challenges are also opportunities.

And so, we've been looking at the interfaces between these different challenges to figure out how can each challenge somehow support or improve the outlook for the other challenges.

And climate change, to me, is an opportunity to understand the next series of education, experience that architects need to have in order to adapt their practices, their buildings, the way they run their firms. To understand how to, then, approach a 2020 zero net energy for a residential, and 2030 zero net energy

for nonresidential.

And so, we've been very active in trying to get the word out to our practitioners about what they need to know about every code cycle change.

And I believe the 2016 has been adopted. I was here that day, Commissioner McAllister, and was pleased to know that I believe the Commission had taken serious the, I think, over 100 comments about the draft language.

And we found that they had listened to some suggestions that we'd had, and we're very pleased with that.

Again, architects are the stewards of the natural environment. We need to understand and, again, going back to education taken place in the school or college of environmental design.

A building is not just simply an object. It shelters its inhabitants. It has a footprint upon the land that is using from the day that it was conceived of, it is taking resources out of the natural environment.

In architecture school, our classes certainly covered the siting of buildings, the exterior envelope, the micro-climates that that building would have to live within. We talked about the communities. And, of

course, we have a tremendous history that impacts the way that we think, the way that we design.

So, I see, I personally see climate change as an inspiration to give me more ideas about how to properly design a building. And that's what we're encouraging our members to do.

The other three elements all work together. They can work together. They're not only challenges, they're opportunities.

How can firms, that have been well-established, welcome the young students and graduates into their firms? How can they understand what they've learned in school that a person, who's been in practice for 40 years, has not really had a chance to go back and understand? And how can those graduates understand from the older people in their firms about what it takes to put together a building?

You do not learn how to put together a building in a five, or six years, or more of college. It is something that is learned on a day-to-day basis, working in a firm.

We also understand that technology is something that can help us in our profession. Some people have the notion that CAD and BIM are going to take over the architectural profession. That is not true. The human

mind can be inspired and is creative, and that's the hand that uses that particular skill, and that is the human mind.

Anyway, most of us do work with existing buildings, remodeling, additions, major part of many architectural firms. We want to be part of helping existing buildings become more energy efficient.

We've worked closely with the IOUs in California for the past two years in developing training programs. And we want to continue that relationship. And they've reached out to us and asked us what we needed.

And I won't be satisfied, and I told this to Jeanne Clinton, I won't be satisfied until every architect in this State has taken some of this training to understand the building science behind an effective building envelope.

And secondly, integrated design, integrated project delivery, where you bring mechanical and electrical engineers to the table. And if you can, get the contractor there from the very beginning. That's the only way we're really going to get to zero net energy. Thank you.

COMMISSIONER MC ALLISTER: Thank you, interesting. Appreciate your being here.

So, do we have Ralph on the phone?

MR. PRAHL: Yes, I'm on the line. Sound check, can everyone hear me?

COMMISSIONER MC ALLISTER: WE can hear you, great. Maybe turn up the volume just a little bit, if you can, Heather.

MS. RAITT: Yeah.

MR. PRAHL: Okay. Thanks very much for the opportunity to present today. I am acutely aware that I am both the last speaker of the day, and the only speaker all day who's doing so remotely. So, I'm planning to try to be brief. At the same time, being brief is not necessarily in my nature, so you may see an epic battle between good and evil.

(Laughter)

MR. PRAHL: The next slide, please. I don't have an organizational affiliation that people, who don't know me, won't necessarily recognize. So, I thought I should start by briefly talking about my background.

I am an independent consultant, specializing in advising state agencies on oversight of evaluation activities. I've been at this for some 30 years, including many years advising the CPUC Energy Division.

About 20 years ago, I began a sideline of analyzing and writing about public policy issues

regarding market transformation. So, wearing those two hats, in 2014, with my co-author, Ken Keating, I wrote a white paper for the Energy Division called *Building a Policy Framework to Support Energy Efficiency Market Transformation in California*. The same title as my talk today.

ED asked us to write this paper because Ken had written an earlier paper on the design of market transformation initiatives. And we got lots of comments from the IOUs and from the public that what he wrote was all fine, but there were policy barriers that needed to be addressed, first. We agreed, so we were interested in writing this paper.

The focus of my talk today is on two specific questions. What policy changes would be needed to more fully support market transformation initiatives in California? And what organizational models could work in California?

In short, if we want to do more market transformation initiatives, what needs to change?

My comments will be taken largely from the white paper, although there has been some minor evolution in my views since then.

The next slide. Onto policy changes needed to support market transformation, to slide four, please.

So, as Talbot said, sometimes terms are not clearly defined. And people talk about market transformation, so I wanted to start out by defining terms as clearly as I can.

And there are two key terms I think you need to pin down before you start talking about policy issues and market transformation. And those two terms are resource acquisition and market transformation.

My definitions of those terms are as follows. Resource acquisition is the attempt to produce near-term savings as reliably as you can.

Resource acquisition is the mainstay of the energy efficiency industry, where most of the money is spent, both in California and elsewhere.

Research acquisition involves trying to buy kWh savings one kWh at a time. It tends to involve primarily, although not solely around financial incentives. And the focus tends to be on the relatively short term, largely on annual savings.

Targeted market transformation initiatives, MT for short, on the other hand are an attempt to produce long-term changes in the adoption of energy efficiency by generating structural changes in the market.

Market transformation initiatives tend to involve a wider range of marketing approaches.

Incentives can be a part, but they can also include negotiation, education, persuasion, coalition building, transitions to codes and standards.

Market transition takes a long time, typically five to ten years. And it's a lot risker than resource acquisition.

As Susan described, NEEA is probably the prominent practice of market transformation initiatives in the U.S., but even they have had plenty of failures.

But when it succeeds, it can produce long-term gains.

The next slide. So, we made three key points in our paper about what should change in California's policy work -- policy framework, if there's a desire to do more market transformation initiatives.

The first, and perhaps the most critical, is that we believe it's really important to view market transformation as a policy tool, rather than an objective in and of itself. There's plenty of evidence that market transformation is an important part of the tool chest. There are plenty of success stories, many of them from NEEA.

However, being part of a tool chest is not synonymous with being an overall policy objective.

There are two problems with treating it as a

policy objective. First, not all markets really need to or necessarily can be transformed. Some markets are already producing a petty optimal level of investment in energy efficiency.

Other markets have barriers that can never really be fixed, so we'll need to keep buying savings a kWh at a time, indefinitely.

An example would be markets that are subject to split incentives, such as renters paying t energy bill.

The other problem with treating market transformation as an overall policy objective is that it tends to pressure program administrators to fit all of their programs into a single framework.

If you tell the program administrator that everything it does has to be at least partly market transformation, what you get is resource acquisition programs dressed up as market transformation.

So, why are we associating so much importance with this issue It's because we believe that there is a fair amount of history in California, of treating market transformation as an overall objective.

I was consulting to the Energy Division back in 1997 to '99, when market transformation was explicitly and officially the sole objective of energy efficiency programs in California.

A more recent example, I would say, is the current Energy Efficiency Strategic Plan is fairly imbued with the idea of market transformation being an objective.

The next slide, please. The next policy point we made in this paper is that there is a lot of potential for tensions between market transformation and resource acquisition, if you don't coordinate them carefully.

They're both important parts of the tool chest, but that doesn't necessarily mean you can just toss them out there, willy nilly, and expect to get good effects.

One reason you need to coordinate is that if you don't, resource acquisition is dominant. And Susan said, it's 90 percent of the money that gets spent in the Northwest. And resource acquisition can undercut market transformation, if you don't take clear steps to prevent that.

One example is what happened with CFLs in the early 2000s. There were massive resource acquisition programs flooding the market with CFLs. Sometimes there wasn't enough attention to quality. There were some early failures and some people got soured on CFLs. The effort to achieve resource acquisition ended up, perhaps, undercutting market transformation.

Another issue is that under a resource acquisition framework, or what is predominantly a resource acquisition framework, the relentless focus on reliability of savings can tend to limit market transformation strategies.

The recent example of this in California occurred with EUC, energy upgrade. People had been hoping, a few years ago, for market effects from EUC. But research found that the rather strong requirements for documentation of savings were turning contractors off. In order to get market effects and market transformation, you need to get contractor participation. So, the desire for reliable savings was working at cross-purposes with the desire for market effects.

The other side of this coin is simply to respect the differences between what each of these types of programs can accomplish. If market transformation is slow, but can really hit the ball out of the park from time to time, don't expect it to generate quick or reliable savings.

Don't expect resource acquisition to transform markets. It happens sometimes, but it's more the exception than the rule.

And don't try to deploy both of these approaches

in the same market, at the same time, without close coordination. There are plenty of ways to coordinate, if you pay attention to doing that.

The next slide. The third key issue, policy issue we addressed in this paper was whether basic changes are needed in California's approach to cross-benefit analysis.

And our conclusion is that there were no fundamental changes needed, but the few changes that were needed were pretty important. The most important one is the time frame of the analysis.

At least in the world of ratepayer-funded programs, California's core benefit cost methods generally have a short time horizon, typically either annual or over a program cycle.

This is a big problem for market transformation initiatives because they tend to feature costs that are front loaded and benefits that take a while to materialize.

So, if you subject them to the same time frame that you're using for research and acquisition programs, they'll never screen. You won't get market transformation and you'll just do the screening process.

I'll skip over the sensitivity analysis issue, in the interest of time, and on to slide eight.

So, the other basic issue I wanted to address is what organizational model could work in California?

To slide nine, please. And I think in answering that question, a threshold issue that needs to be resolved is figuring out what role IOU should play in administering market transformation initiatives.

IOUs are only a part of the program administrator network in California. You also have RENs, POUs and various other parties.

But the IOUs are a very large part and they'll argue there are some unique challenges for IOUs in administering market transformation initiatives.

So, should IOUs play a major role? On the plus side, the IOUs have a lot of experience, now 12 years, at running large scale programs. They also have lots of resources and the data needed to support market transformation initiatives.

On the con side, though, there are several issues. First, IOUs are largely customer-interfacing enterprises. They exist to serve end-users. And one might argue, as a result, that they are better adapted to marketing to end-users, than trying to alter entire markets.

IOUs are also publicly listed corporations. And like all corporations, they're subject sometimes to

short-term pressures.

IOUs are also the primary locus of responsibility for research acquisition in California. And as I argued, there is a lot of potential for tensions between resource acquisition and market transformation.

So, if IOUs are going to do this, it would need to be done carefully.

Perhaps, for all of these reasons, when you look at the history of market transformation initiatives, there aren't that many success stories about initiatives that were administered solely by IOUs.

There are a fair number of success stories in which IOUs were members of broad regional or national coalitions.

The next slide, please. So, my conclusions about who should administer market transformation initiatives. I would argue that you can either create a dedicated statewide entity to do it or you can delegate the job to existing program administrators, including the full range, IOUs, RENs, POUs.

However, if you use the latter approach, I would argue that policy measures are going to be needed to overcome some of these institutional barriers that I think IOUs face.

One issue is the need for a market -- for performance incentives that are specifically targeted at market transformation, instead of research acquisition.

If you rely on the overall incentive mechanisms that are in place, in California, the overwhelming incentive for IOUs is going to be focus exclusively on resource acquisition. It's fast, it's predictable, and management knows it will pay off before they retire, but you won't get real market transformation initiatives.

And second, I would argue that if IOUs are going to do this, it will be necessary for them to collaborate more extensively and systematically than they have in the past.

IOUs, I think, are used to acting on their own initiative, subject to the regulatory constraints they face. This inherent, I would argue, in their structure and role. They are accountable to their shareholders, so it's not surprising that they would act on their own initiative.

But unilateral action doesn't really work with market transformation initiatives. I think the long-term body of evidence shows that.

So, that concludes my talk. And on my last slide here, the next slide, please, I've just given information for anyone who's interested in accessing

this policy white paper directly.

Thank you and that concludes my talk.

COMMISSIONER MC ALLISTER: Thanks very much.

Let's see, I have a couple of questions. I'll start with the Chair.

CHAIR WEISENMILLER: Yeah, let me start with a basic question. Which, my recollection was 1890 passed California about the same time the Northwest organization was set up, and was very interesting, that third-party administrator, and a number of people worked on that for a number of years. Ultimately, they got sued in terms of civil service issues. And I think that collapsed things at that point.

So, one of the things I want to understand is what's the -- what's in place so we're not sued again, and after several years of activity? I don't know if Jeanne, or if the gentleman on the phone want to discuss that.

MR. PRAHL: I was directly involved in that. Maybe I could address it.

I can report that the lawsuit was filed by state employee unions, and it was filed because they believed that consultants to the California Board for Energy efficiency, which included me, were doing work that should be done by sate agencies

Now, I think if you either have IOUs and other existing administrators do this, or create an entirely new dedicated organization, it's hard to see where you would have that issue. I think it was just a function of the institutional environment at the time.

CHAIR WEISENMILLER: Okay. The next question is, is it anticipated that CCAs, or direct access entities would participate or help fund this entity?

MR. PRAHL: Is that directed to me?

CHAIR WEISENMILLER: Yeah, I guess so.

MR. PRAHL: I don't think I have a -- don't think I have a view on that. I haven't gotten past the threshold issue of who should do it. And not really advocating a statewide entity. I'm saying that I believe you can either do that or tweak the policy framework and do it using the existing program administrators.

CHAIR WEISENMILLER: Okay. I was going to just ask a question of a couple representatives of the POUs in the audience. I guess Jonathan's the most likely one.

You want to discuss the POUs' reaction to such an entity, or much you do in terms of market transformation, now, or how much you'd be willing to participate in a statewide entity?

MR. CHANGUS: I think, perhaps, a good way to respond, from NCPA's membership at least, is when we've a good, long, hard look at do we want to participate and fund some of the work that goes on with codes and standards development, and funding a work paper of some sort.

Our ability for resources enable to fund such an activity would be somewhat limited and detract from some of our other efforts that are specifically tied to the programs directed at our customers.

And so, it's a tension of those scarce resources. Are we more interested in pursuing dollars that we know are going to benefit the ratepayers, the customers within our service territories versus dollars that go to a statewide entity.

That, as we've seen, our membership have very unique challenges tied to the city limits with which they represent in most cases. And so, it's trying to figure out what the appropriate role is.

I would also note, we are participating with the IOUS, and with the largest stakeholder group on the development of the California Technical Forum, which is trying to develop resource kind of in common.

So, I think there's ways for public power to participate. I don't know if it's going to look and

feel the same way as the IOUs, and it might not come with a hefty check. But I think that there's ability and interest in being at the table, and contributing whatever resources we can as far as knowledge, experience, and understanding of what our customers need.

COMMISSIONER MC ALLISTER: Yeah, let's see, I guess, Dr. Carla, do you have a --

CPUC COMMISSIONER PETERMAN: No comment.

COMMISSIONER MC ALLISTER: So, I guess, so I'm intrigued and sort of thinking about, you know, Susan, as you were talking, okay, what are the similarities and differences between NEEA's context and what might happen here in California.

You know, I'm really struck by the fact that it's a voluntary initiative that the utilities, including BPA, but many others, IOU, POU, and the Energy Trust, neither of the above are sort of all in agreement that they're going to fund this thing.

And I guess I can't help but see that in California that seems highly improbable, given our kind of -- give the past dynamics that, at least, I've experienced and seen, observed in terms of non-utility entities taking on more, shouldering more roles, and getting in front of the customer and working, sort of

working on some of these issues.

So, you know, perhaps I really need someone sort of who's in the California context to make observations or answer this question.

What is to keep -- well, what, in the NEEA experience, how have you had access to data that allows you to target opportunities, understanding of dynamics in each utility service territory with some level of nuance? You know, what has kept you -- you know, why is this consensus that what you're doing is a good thing, and why isn't there, apparently, some sense of competition with the utilities, themselves, on messaging to the customer?

MS. STRATTON: You know, interestingly, you know, before we go too far with an initiative, if there's a marketing message or information, you know, we may -- we'll work with our partners and decide, you know, should NEEA create the messages and the utilities actually put it in a marketing campaign, or should NEEA create a broad, regional campaign. So, we struggle with that exact issue quite a bit because the utilities want to have their messages to have their name on it. Because the customers trust that utility name. NEEA might be less known to the direct customer.

So, we're very mindful of that. Although, there

are times when we may create a ductless heat pump campaign that everybody participates in.

And coming back to the data, we don't have -- NEEA, as an entity, does not have access to utility customer data. I wish that we did, but we don't. We have to buy data if we're looking for, say, customers to participate in a demonstration project.

We regularly collect or perform research in the region around, say, residential building stock assessment, or commercial building stock assessment, code compliance, those kinds of things so that we give back data to the region on a regular basis, and maintain a database and data analytic services for the utilities, even allowing them to over-sample in the research work that we do.

So, it's a situation where it's a benefit to the utilities not having to do, say, a residential building stock assessment all by themselves. Rather, they buy a small share of what NEEA's doing and, cost effectively, we can get that data to everybody.

So, there's tensions around who does what, what are the roles and responsibilities. In the beginning, the utility, energy efficiency or DSM staff were either very small or nonexistent. And NEEA was the only show in town for some of the utilities.

Over time, since the late '90s, many of the utilities have very robust staff. Some even do some emerging technology work, do some research. So, we're always mindful of where they are in the market, and where we are. And when we both seem to be in the same place, try to find a way to share that role or make a better delineation of what the role of NEEA is and what the role of the utility is.

Because you can imagine that across the region, each utility is in a different place. Some utilities would like NEEA to do everything and others would say, don't do anything, except this one thing that we're not doing.

So, we're always finding, like I keep talking about, the sweet spot. I'm a tennis player. So, you know, that to me is that spot on the racquet where you get the best shot.

Well, for NEEA, you know, finding that sweet spot gets more and more complex as the utilities broaden in the market from direct to customer and being more upstream. We've typically operated mid-stream and upstream with manufacturers, for example. Utilities are getting more involved in the mid-stream market.

So, that challenge and push, I wouldn't call it competition, but we don't like to find ourselves in the

same place, doing the same thing, with the same ratepayer dollar. So, we're always mindful of that and needing to be nimble, and adjusting where we are in the market.

CPUC COMMISSIONER PETERMAN: Can I clarify just something on that, but just in terms of is there -- with each initiative, is there one single or sweet spot? You noted that the utilities had varying views about how much they should participate. So, is it the lowest common denominator?

I guess I'm trying to think a little bit about how we're thinking about the potential involvement of POUs, and IOUs, and so just trying to get a sense of how statewide your work really --

MS. STRATTON: Right, and that's a good, a really important question. Do we -- are we reduced to the least common denominator? And I would say, we sometimes find a sweet spot where it's not as valuable for us to do something in a market. But for the good of the region, a utility will say, yeah, I'm okay with that.

So, we kind of have these discussions where, as long as it's not hurting kind of customer relationship, or being wasteful of regional dollars, we've come to find this place where each of the utilities that sit on

our board have veto power on moving for -- any one of them can raise their hand and say this is not good in my territory. And they've got to come back and say what would make it work. And so, they have a responsibility to do that.

So, that's how we find the sweet spot. Any utility can stand up and say stop, we need to adjust something. And the others, who are okay with it, maybe it's not the highest, you know, use of the division of resources, but we find that sweet spot by a lot of collaboration, working together and finding the right place for the good of the region.

CPUC COMMISSIONER PETERMAN: Thank you.

MR. DOUGHTY: Susan, is the voice of a 0.4 percent member the same as a 36 percent member in that?

MS. STRATTON: Let me just say yes. Not everybody's happy about that, but that's how we work.

So, if we have an initiative and we're voting on moving forward, BPA has the same number of votes as Tacoma Power.

COMMISSIONER MC ALLISTER: So, it really is a UN, there you go.

MS. STRATTON: It is.

COMMISSIONER MC ALLISTER: A general assembly, exactly. Yeah, there you go.

So, I guess, I'd -- I can't remember what percentage the Energy Trust puts in, but they're not a utility and they do have some of the sort of facilities that -- in terms of resources, but also in terms of access to data, as I understand it, anyway.

MS. STRATTON: They do.

COMMISSIONER MC ALLISTER: And I guess, so, they also are sort of a market transformation entity, but they're just more working -- not the way you defined it, but I think they're -- you know, they do administer programs and they do kind of upstream and mid-stream stuff, too.

So, I guess I'm kind of wondering, you know, differential impacts across your whole territory, you know, the different models that are even there within your territory and among your members, and that dynamic, sort of how much cross-pollination is there across service territories or members?

MS. STRATTON: When we look at Energy Trust of Oregon, they are, they were created to be the resource acquisition arm of the investor-owned utilities, gas and electric in Oregon. They also do renewables.

COMMISSIONER MC ALLISTER: Oh, okay, right.

MS. STRATTON: So, instead of us working directly with PacifiCorp, or Portland General Electric,

ETO, you know, has that funding and they run the programs.

So in that sense, you know, they're like the utility in terms of their role. But because of their -- they've got very high level of goals and very, you know, strong passion for energy efficiency, they're one of our entities, funders that have gotten a little more involved upstream and with wanting to be more involved in market transformation.

So, we've found that they're an organization we've got to coordinate with quite a bit more. An example is that we were involved in strategic energy management for industrial customers for a long time, and produced a number of tools and strategies in the market. And Energy Trust said, boy, those tools have been great. We're using them, we've got vibrant programs.

We don't think, NEEA, you should invest a lot more money in that sector. Other utilities are saying, oh, no, we don't have enough, yet, we haven't started our programs.

So, we had to find a middle ground, where we provided some tools and services, but not a broader portfolio of strategic energy management on the industrial side.

So, that was an area where Energy Trust was

ahead, smaller utilities were behind, so we found a place that could provide services, you know, that were needed, without over-investing from the viewpoint of, say, both BPA and Energy Trust.

COMMISSIONER MC ALLISTER: Interesting. So, I just have one more question. How bit of an issue are the, let's say, is the diversity of your territory? I mean, you've got rural, urban, you've got big, small, you've got public private, and we have all of that in California, as well.

And I guess, in terms of some of the concerns that have been brought up, gosh, you know, this municipality versus all of Northern California, kind of the diversity of needs and customer base. How do you deal with some of those issues?

MS. STRATTON: And those are tough issues. I know that some of our utilities, who are east of the Cascades, you know, think that the view from Portland is just up and down the I-5 corridor.

So, we're always mindful to make sure that we're east and west, north and south, small and large, IOU, public, et cetera.

But when all is said and done, when we were negotiating this last funding cycle, there was a real desire to pick a small number of programs, to make them

optional.

Up until this time, it was a pay one price, you get everything. And the theory was there's enough in the portfolio for everybody, but not everything in the portfolio was for everybody.

We had a number of irrigation initiatives in the past. Those are not for everybody.

So, we found that having things in the portfolio to balance off something else was always needed.

But we came to a place where a couple of the utilities said, you know, could we try, for the first time, segmenting off a small number of programs as optional?

And we said, okay, let's do that. And if we don't get enough uptake, that means we're just not going to do those programs at all. And to be sure, the three programs we offered as optional, there was enough uptake to move them forward, just in a reduced scale.

So, we found some compromises that needed to happen. We found that we needed to do a lot more coordination, especially on market facing activities. The utilities want to be hand-in-hand with us, or even in front of us, and we're behind the scenes. So, we're always mindful of that and making sure that that customer/utility relationship is important in how we do

our work. But then, there's the what work we do that's the other part of the equation. So, never an easy answer.

COMMISSIONER MC ALLISTER: Thanks very much. Interesting to spin our wheels a little bit and think about how that might -- that model might work here, in California.

Any questions from the dais for Talbot or Linda? Appreciate your both being here. And, certainly, the architectural profession is very -- it's critical for this kind of getting into the existing buildings in a meaningful way, and offering designs that the actual people, who live in those buildings, can benefit from. I think we can do all of the above, we've just got to get better at it.

MS. STRATTON: I will also say, I've brought along a number of small portfolios about NEEA, and they're out on the table, if you want just a little bit more detail about some of our work. But they're out on the front table.

COMMISSIONER MC ALLISTER: Thanks very much.

CPUC COMMISSIONER PETERMAN: Well, I mean, I'll note, and Talbot, you may have some other comments, as well, but we spent a lot of time talking about a potential market transformation entity, largely because

there's some legislative proposals in front of us, we're all trying to get our head around.

But I was wondering if you and, you know, your members have had experience working with NEEA, or Efficiency Vermont, and if you had any feedback for us as we consider looking at structures like these?

MR. GEE: Yeah, I don't know if we have a comment on the structure that the State might approach. But I will say, Ralph's comments on, and Susan's, on leverage and scale are really important here. But from a trade ally perspective, pilots are a nightmare. Pilots are really hard because it's so small, but it's so much effort.

And from a business perspective, you're pulling away attention, effort and capital for this one pilot in the hopes that five years from now, it will be big enough to justify going broader.

Whereas, if you can go regionally, or statewide, or whatever, with a single strategy for a very specific outcome, it's a lot easier to get buy in, if that makes sense.

And the other aspect, and we've seen well-intentioned efforts in California, kind of go awry just because every utility then, eventually, gets their own administrator, their own back end. And the paperwork

never gets aligned. And it's really -- no one builds their service territory around utility service lines, it doesn't work that way. So, that's another barrier there.

So, whatever the outcome is, it would be great if we decided that this is a market transformation effort, that it is a statewide or leveraged effort to do it.

As far as, you know, Efficiency Vermont, or NEEA, or other partnerships around the country, I mean we've had -- members of ours have been very involved in several of them.

The only thing I've ever seen, and I don't think this pertains, necessarily, to NEEA, but in some areas you get -- the loudest voices are the ones who get heard, right. So, you'll have one or two market actors who jump all the way in, with two feet, and they start dominating a lot of the discussions.

And then, unfortunately, you get the organization in a situation of picking winners and losers in the marketplace. And that's an alienating practice. If the minute you do that, you now start creating, again, a conflict with your trade allies. So, I don't know, you've obviously been successful in what you've done. Maybe there's a council, or an alliance,

or whatever the case is with the trade allies to kind of help prevent some of that stuff from happening. But we have seen some programs go awry in other areas because of that.

CPUC COMMISSIONER PETERMAN: Susan, do you have a quick comment or response, I mean, with how that working relationship is done with trade allies?

MS. STRATTON: You know, our trade ally relationships are different for each initiative, depending on what the barrier is we're trying to remove.

If it's in residential new construction, we may look for construction firms that are willing to try some new technologies on a small number of homes. So, we're asking them to really change their practices so that we can measure the results before we say let's go big. And So, we're trying to manage risk in that.

And so we find, you know, willing participants. And if they're successful, then they can raise their hand and say I'm the best, you know, builder of this type of home. So, we do look for partners that are willing to take that risk before we go big and try to spread that throughout the region.

In HVAC, and other areas, you know, we have trade ally groups that are -- we have, that are contractors, who actually manage kind of communication,

outreach, exchanging information with those trade allies, how is this working in the field? You know, can you give us information about your experience?

So, we're always trying to take that feedback. You know, there may be some areas where it's never -- it's not perfect. But it's a thing that we do and we work really hard on.

CPUC COMMISSIONER PETERMAN: And I have one more follow-up question. Andrew, sorry.

Susan, do you have any specific programs that you have targeted to low-income communities?

MS. STRATTON: We do not.

CPUC COMMISSIONER PETERMAN: Okay.

MS. STRATTON: The local utilities handle those programs.

CPUC COMMISSIONER PETERMAN: Thank you.

COMMISSIONER MC ALLISTER: Okay, thanks. So, we are a little bit behind schedule here, but we have a number of blue cards.

I'm going to start with the ones that pertain to Panel 3, so the by and large on the to-code and existing buildings. And then go on to Panel 4 and general comments.

So, let's see, Bob Raymer, it looks like he may have left. I'm going to hold that.

AUDIENCE MEMBER: He was just going to be positive.

COMMISSIONER MC ALLISTER: Yeah, exactly, I'm sure he was just going to endorse everything we're doing.

Let's see, okay, Peter Schwartz, from LBNL.

MR. SCHWARTZ: Good afternoon, Commissioners, and all the diehards. I thought it was going to be like in Congress, where we speak to an empty room, but glad you're hanging around.

So many issues, so little time. Let me just dive in and see if we can address a couple of them.

There's been a lot of talk relative to cost effectiveness methodologies, new vehicles for financing, capital improvements in these projects. And, you know, I have to support Aaron's position relative to trying to implement innovative technologies using the regulatory framework becomes more than challenging.

In large part because the cost effectiveness for the regulatory mechanism is not the cost effectiveness for the market. And so, there's a disconnect when trying to promote these technologies. And it's, in essence, tying the hands behind the back of the implementers, who are trying to promote this, because there's a mismatch. And, invariably, there are many

times when you are promoting the wrong technology solution to maximize the regulatory cost effectiveness, and it runs count to how customers evaluate what's best for their bottom line.

So, also, in terms of TURN's comments, there are a lot of new mechanisms that are coming into the marketplace from nontraditional players. And my role at the lab is heading up the lighting and controls research team, and I do a lot of work with Demand Response Research Center.

And prior to that, I worked for a line and control startup. And it was really tough selling the technology. Simple payback was not how you had to calculate it. You had to get at the true value of the technology over the investment period, and that's a more sophisticated sale, many times taking up to three years to convince a customer.

With that, some of the key points are pilots are good because you had to condition the marketplace. And it does get into market transformation in that we're at a point right now, with some of these technologies, in particular advanced lighting controls, that mirrors where we were in the early '90s, with advanced HVACs. Moving from pneumatic systems to direct digital control, using Bath Net, we had to go out and do extensive

training of the industry to create the professional workforce to actually be able to specify, design and install the systems.

And I think that's a little bit of the backlash in the Title 24 is we haven't done that conditioning of the marketplace. The technology's fine, the cost effectiveness of the projects are find, but we need to develop that workforce.

And I'm seeing my time is up. You're waiting this time. And I'll address the other comments via written, so we can get some of the other folks up here.

COMMISSIONER MC ALLISTER: Thanks, Peter.

MR. SCHWARTZ: Thank you.

COMMISSIONER MC ALLISTER: Appreciate it.

Actually, the Chair just had a good point. Heather, do we know when written comments are due? Have we given that data, yet?

And I'm going to call Jenna Olson, from PG&E.

MS. RAITT: July 28th.

COMMISSIONER MC ALLISTER: Oh, okay, great. Thanks. Well, we'll see how much time is left when we get through everybody.

Karen Herter, hey.

MS. HERTER: I'll try to make this short. I have just two comments, suggestions, since you guys keep

saying you want suggestions, I had a few that I thought I'd --

COMMISSIONER MC ALLISTER: And you believed us, I men?

MS. HERTER: Yeah. No.

(Laughter)

`MS. HERTER: So, the first was, very simply, I wanted to support the Panel 3, in their efforts to start looking at hourly-metered data to create baselines.

I've been working on teams for a decade, over a decade that does just that. And we've been improving the process as we go along.

The most recent project, we create baselines, temperature-dependent baselines, so that we corrected for temperature and other things, for over 17,000 customers. And so, it's definitely possible and there are lots of folks out there that can do that, and can do it very accurately. So, that's simple.

The second one was of the duck curve. So, the ISO, I know mentioned demand response. And one of the things that I think that gets lost, when we talk about energy efficiency and demand response is the piece in the middle that is sort of load flattening.

For the duck curve, you can do something with

demand response, but it's only once or twice a month.

For energy efficiency, it's maybe going to help a little bit if you have better air conditioning efficiency at the head.

But for load flattening, I would recommend you consider better controls, and starting with air conditioning thermostats. You don't need communications for your thermostat to pre-cool in advance of a high peak period. And with time-of-use pricing coming, soon, I would encourage vendors to start thinking about creating their thermostats to allow customers to easily program their thermostats to avoid that peak price.

We've found in studies, so I've worked with SMUD for the last eight years, helping them design their smart grid studies, looking at thermostats, and pricing, and real-time data, and all of that stuff.

One of the studies that we did, we looked a pre-cooling. And we found that customers that had at least an R-38 ceiling insulation, didn't waste energy by pre-cooling, as early as six hours in advance for two degrees.

And so, the energy didn't go up, but the load was very much flattened. We had a higher load in the mornings, of course, when we were pre-cooling, and then a very much lower load during peak. So, that's one, but

that's air conditioning.

There's also, there's EVs are an obvious choice, right. There's pool pumps, and spas, and water heaters, I think, to some extent.

So, I would say controls and the usability of controls, the usability of thermostats.

We also did a study where we looked at whether thermostats wee usable and by and large they're not. Even the most advanced and best ones out there are not great. I think that we could put more effort into usability studies to pinpoint which ones are usable and which ones aren't, to really push the industry into a direction where customers can program their thermostats and other controls. Thank you.

CHAIR WEISENMILLER: Okay, I would note for your written comments, for people's written comments, the Energy Commission has always had a provision that we can do load management standards. We did those, once, for the first time, and maybe it's time again.

COMMISSIONER MC ALLISTER: Yeah, you know, we used to talk about load factor was the big thing. Load management, load factor, back in the 80's and 90's, those were the terms we used, right. And then, the lower the load factor the better, right.

Or I'm sorry, the higher the load factor, the

better.

So, it seems like we've kind of gotten away from that, but that's essentially what we're talking about with rearranging the duck. So, optimizing investment is really what it's all about. You've got to juggle all these resources and coordinate them. So, I think you bring up some great points.

Let's see, we have -- so now, that's all I have for Panel 3, unless Bob Raymer's back in the room, which I don't think so.

So, Joseph Oldham, from the Local Government Commission. Oh, one more, great.

MR. OLDHAM: Good afternoon and it's a pleasure to see you all again, after the SEIT forum. We had a great time back on June the 18th.

I'm just here, briefly, to echo what was put out at the forum. Integration, I think, is going to be the key for us to achieve the goals that we have set forth in California.

The Local Government Commission, of course, is actively working with local governments up and down California to not only implement energy efficiency programs, but to look at smart growth, and all types of resource efficiency efforts.

So, one of the challenges that we see with local

governments, obviously, is a lack of resources to participate in the State programs, and the State agencies.

We would strongly encourage the State to think about coming up with a, for lack of a better term, a combined pot of funding that local governments could utilize to help achieve these very integrated goals that now we have set forth for ourselves.

You know, the challenges of reducing our fuel usage on existing vehicles, the challenges of improving the efficiency of all of our existing buildings, the challenges of deploying 50 percent renewables. All of those are going to have an impact on local governments, and they can play a strong role in helping the State to achieve those goals.

So, we would strongly suggest that the State agencies and the State look at a way to more effectively engage local governments and make sure that they are capable of participating effectively, and not just the local governments that have the large capacity, and can achieve -- you know, put forth the programs and get engaged with the programs.

So, that's something that the Local Government Commission strongly supports. And, you know, we're going to work as hard as we possibly can to help

California achieve its goals throughout all of this. So, thank you very much.

COMMISSIONER MC ALLISTER: Thanks, Joseph.

Bidding adieu to Cliff, thanks very much for your leadership. And give the Governor our report about how wonderful the workshop was. We'd really appreciate that.

Jonathan Changus, from NCPA.

MR. CHANGUS: Quick, since you've heard plenty from me already today. Talking a little bit about data, I think the important piece about who are we providing data to, because I think it has very different meanings and has very different implications depending on who the recipient is.

And I think the low-hanging fruit, if that's what we want to call it, is equipping customers with better data about their own usage, and in a form that is meaningful and helps them understand, is something that we can probably get behind.

I think that there's been some mixed messages, as far as how much utilities should be doing as far as assessments and audits since those, in and of themselves, don't usually result in kWh savings, which is the primary metric with which we're judged on our investments.

And so, I think some clarity as far as, no, it's more of a market transformation effort versus RA. And that's something that we should be encouraged to do, as I think feedback we're starting to receive.

The other bit, though, is once we've provided customers with better data about how they use energy, energy efficiency isn't the only thing on the table for them. We've already seen, kind of, they're in competition, really, with solar, and then there's thermal energy storage applications, and well, and then there's going to be electric vehicles.

So, when we talk about market transformation, it's not just limited to energy efficiency. And as we go forward, we kind of have to have a broader perspective, which makes it infinitely more complicated than it already is, talking about once customers have real-time, hourly interval data, what are they going to do with it and what are the signals that we are sending? And how much can we really control?

And those are very complicated questions and I look forward to coming forward with more solutions at some point. But I think the first step to recognize that energy efficiency isn't happening in a vacuum. Technology is moving very, very quickly across the DSM marketplace. And I don't know if we really have a firm

handle, although the PUC has a number of decisions and we, as Public Power, of course, are looking at it very closely as customers are making decisions even independent of utility programs, how then do we plan for the system on the long term.

COMMISSIONER MC ALLISTER: Thanks. And I would just ask that you all think about your third-party partners, and sort of, you know, there's this broader marketplace out there, and those people are selling their goods, and wares, as well. You know, the solar folks have been very successful and we need to sort of create that same sort of momentum around efficiency, and demand response, and all the other services, right.

And so, whether that comes from the utility or somebody else, right, so how can we enable that.

Dian Grueneich, from Stanford University.

MS. GRUENEICH: What fun to be up here.

COMMISSIONER MC ALLISTER: Thanks for coming.

MS. GRUENEICH: Yes. I just wanted to briefly say the work that I'm now doing at Stanford University, some of you are familiar with it, but just to give an update because it's very relevant, I think, to the issues you're discussing here.

Is it's a multi-year project looking at the next level of energy efficiency. And we've had a draft

report of our research circulating. But one of the things that I'm pleased to let you know is that the *Electricity Journal* is taking our work, and they're putting it out in a three-part series this year.

And the first part will be out in their next issue, and it is describing five of the -- the evolving role of energy efficiency, of which one aspect is the duck curve, and really thinking about the integration with the grid, and CARB.

And the second part will be on the new tools and opportunities looking at our financing mechanisms, our technology evolution, and that sort of thing.

And then the third is the policy framework. And we'll certainly be keeping you apprised.

I had a couple of comments on sort of the research that we've done. One is on tracking progress and whether it's the Governor's goals, or whether it's if the new EERS passes.

In our research, we found that it was very difficult to understand the actual savings on codes and standards. And that's part of what we heard about today, which I think is driving some of the baseline discussion.

And I know that's a matter of resources, as well, but I think that figuring out how to understand

where we're coming with the codes and standards. As I think about it, it is three buckets. One is from the utility or customer-funded programs, of which there are set protocols.

The second is the codes and standards. And then the third is market and pricing effects.

And that latter category, also, I think, really needs some careful thought about how we will track it. Especially under AB758 that's looking towards us getting to the marketing.

This next point I'll say is that I think the baseline issue, I've taken a position on it. I think it's time to just get those savings in the buildings and figure out how to avoid double counting, figure out what's the right use of ratepayer money.

But this is climate change. We don't have a lot of time to say we wish other people were doing it. Let's use this public money and get into it.

We are doing our work right now, as we are looking at pay-for-performance programs around the country, similar to what Cynthia Mitchell talked about. And we'll be happy to work with the PUC, or somebody, to host a larger money and sort of to the extent it could jump start thinking about that in the commercial sector.

The second area we're doing additional work is

on the load shapes with the duck curve, that energy efficiency measures have different impacts.

and then the third area is on the evolving EM&V, using interval metered data that Stanford has, account level data -- interval meter data for about 400,000 PG&E accounts. So, we've been spending a lot of time thinking about how could you use that interval meter to really help on the EM&V. Thank you.

COMMISSIONER MC ALLISTER: Are you supposed to tell us that you have that data? I think we might have --

MS. GRUENEICH: Yes, we can tell you. What we can tell you is what it says -- no. It's been whatever it is, anonymized, fully consistent with the PUC.

And I want to let you know, I went through my first signing of an NDA with Edison, on the preferred resource pileup. I now have a different view on how to get easy access to data.

COMMISSIONER MC ALLISTER: They usually tell you that you're not supposed to even tell anybody that you have the data, but --

MS. GREUENEICH: No. There are actually, now, published articles on some of the -- it's fascinating, when you go through and develop load curves for 400,000 different buildings and discover the curves that are

being used in planning don't match up anywhere near what you really see.

COMMISSIONER MC ALLISTER: Thanks for your comment.

Jody London, from the LGSEC. That's for sticking it out until 5:00.

MS. LONDON: Good afternoon, thank you for your time. Maybe next time you can let us know what your time expectations are. We, in the audience, had no idea when the sessions were going to end.

Anyway, on behalf of the Local Government Sustainable Energy Coalition, we are your partners.

COMMISSIONER MC ALLISTER: Hold on, Jody, we were only like ten minutes off on most of the sessions. This last one was --

MS. LONDON: No, but we didn't even know like that Panel 1 would start here, and anyway.

COMMISSIONER MC ALLISTER: Oh, I thought the agenda said all that.

MS. LONDON: It didn't have times on it.

COMMISSIONER MC ALLISTER: Oh, it didn't, okay. Sorry about that.

MS. LONDON: My time is going, Andrew, I know how this works. Excuse me, Commissioner McAllister.

So, as your partners, as your local government

partners who are responsible for making sure that at the end of the day the codes are enforced, and all that stuff happens, we'd love to have a seat at the table next time.

We agree with many, many of the things that were said today. Some highlights for us were these systems are too complicated. You guys are over-studying this.

The amount of money, let's just talk for a minute about EM&V. You guys, I think EM&V -- not you guys, but EM&V is done backwards.

Rather than say what do we need to study and then how much is it going to cost to study that, the CPUC, at least for the investor-owned utilities, says, we're going to spend X amount of the portfolio on EM&V and then they figure out what questions to ask.

And that, to me, seems backwards. It seems to me that we might get a bigger bang for our buck and have more timely use of the EM&V studies, which many people talked about, if we said what are the questions that we need to answer here, instead of shopping around for something.

We really, really, really, really, really need data. You've been a great ally for us, here at the CEC, on that. We're really glad that the utilities have it and now we hope that you will help them learn how to

share that data with the rest of us.

I really appreciated the focus on customers and that customers are lacking here. Local governments interact with customers all the time. We have the best access to them. That's part of why we want to be your partners on this. And we are customers in our own right.

Breaking down the silos is really important. I echo everything that Joseph Oldham said.

There's a lot of activity that's happening outside of the regulated realm, savings that the regulatory agencies aren't even aware of, particularly with PACE programs and other programs that local governments are instrumental in.

So, I hope you'll try to capture those savings.

And lastly, on the issue of workforce education, I'm changing hats here, I'm now speaking as a member of the Oakland Unified School District Board of Directors.

And you should maybe consider linking up with the California Department of Education. There's a huge push right now, in California, around career technical education, which is where the curriculum that kids learn in high school is linked up with what they might do in the future.

And millions and hundreds of millions of dollars

are being directed into career technical education grants for community colleges and high schools. And I think there's a huge opportunity to do a lot of the workforce development that was discussed earlier in the day. And I would be happy to talk with you offline about that, wearing only my Oakland Unified hat.

Thank you. Millions of dollars are being directed into career technical education grants for community colleges and high schools. And I think there's a huge opportunity to do a lot of the workforce development that was discussed earlier in the day. And I would be happy to talk with you offline about that, wearing only my Oakland Unified hat.

Thank you.

COMMISSIONER MC ALLISTER: Thanks very much. Right on time, I didn't even have to cede you your extra 30 seconds. Thanks.

Peter Miller, NRDC.

The last two are panelists. I put them last because they already had their chance. But Peter looks like he left.

Steve Schiller bringing up -- started us out in the -- oh, it looks like he had to leave, too. Oh, okay.

Okay, so yeah, really, Jody, you could have 30

more seconds.

So, that means we're right on time, we're to minutes after 5:00.

I did want to remind people -- oh, do we have a WebEx comment there? Is there anybody who wants to comment at all?

MS. RAITT: So, nobody on WebEx, but we could open the lines for just a moment to see if anyone wants to --

COMMISSIONER MC ALLISTER: Oh, there's Steve, okay. While he's walking up, I would say, just remind everybody July 20th is the comment due date. And so, please get your comments in. Really, it's going to help us along here.

MR. SCHILLER: Thank you. So, I actually had a question for Ralph, but it's at the end of the day, and you all asked for comments and such.

But the thing, actually, the point I wanted to run out and talk to Chair Weisenmiller about, was his question about what happened with the CB and the time there. And it's kind of a message for all of you, and for Cliff, and the chair.

But the difference was that Pete Wilson was the Governor, and Jerry Brown is the Governor, now. It's about leadership. We've talked about a lot of things

today, and leadership matters.

And you all are providing that. The assigned Commissioner was not Commissioner Carla Peterman at that time. Leadership matters. It makes differences. You all are doing a great job in the direction, you know, that your setting and providing that leadership.

We're going to disagree on some of the details and such, but it's really wonderful to be working here, in California, that has that kind of leadership and it makes a difference.

So, I ask you to continue on and the things that happened then, or didn't happen then, a big difference was leadership. And that was my comment, so thank you very much.

COMMISSIONER MC ALLISTER: Thanks very much.

MR. PRAHL: Great point, Steve.

MR. SCHILLER: And, Ralph, talk about Massachusetts sometime.

MR. PRAHL: Okay.

COMMISSIONER MC ALLISTER: That may have to be a future opportunity. It's 5:04. Thanks, Ralph, and thanks to our last panel here, and all the panelists today. I really appreciate your coming out today.

The last thing I want to do is just open the phone lines to make sure we've got everybody covered.

So, is there anybody on the phones who wants to make a comment?

MS. RAITT: Mute your lines, unless you wanted to make a comment.

Okay.

COMMISSIONER MC ALLISTER: I think that's it, okay.

MS. RAITT: I think that's it.

COMMISSIONER MC ALLISTER: Okay, great. Well, thanks to all of you for sticking it out, and Tom and Commissioner Peterman, thanks very much.

CPUC COMMISSIONER PETERMAN: Yeah, thank you, Commissioner McAllister. I just wanted to say, quickly, that I appreciate for many of you, you might have felt like you've had various parts of this conversation many times.

And I can say I, for one, I've learned something from this conversation, particularly just -- I'm really trying to think about what's the next step we can take.

And I really appreciate there's a lot of momentum in this room. And so, the reason we wanted to have this is because we actually do need to make some decisions in the next several months about what to do. And so, thank you for taking the time.

I'm personally very interested, again, to see

how we do things on a statewide basis, how we can be coordinated with the publicly-owned utilities. And so, I look forward to having further conversations in that regard. Thanks.

COMMISSIONER MC ALLISTER: I'll just finalize by saying, you know, I think some of the comments about how we need to work better across the agencies are absolutely -- you know, we're taking them to heart. I think we're working tremendously well, from historically -- relative to historically, I think we're doing more coordination than ever, and really aligned on the policy goals, you know, under the Governor's vision.

But the structural issues are real. I mean, things that are better done are set at the Energy Commission, versus the Public Utilities Commission, versus each POU, what legislation, you know, can reasonably do productively and, you know, help us along and not make things more complicated. I think, really, critical thinking is more important than ever. And so, not just on the technical and the programmatic, but also on the sort of agency structure responsibility issue.

So, you know, something to sleep on and write your comments about.

So, really appreciate everybody, again, participating and giving us your day.

So, we're adjourned.

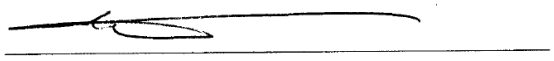
(Thereupon, the Workshop was adjourned at 5:07 p.m.)

REPORTER'S CERTIFICATE

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

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 27th day of July, 2015.



PETER PETTY
CER**D-493
Notary Public

TRANSCRIBER'S CERTIFICATE

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

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 27th day of July, 2015.

Barbara Little
Certified Transcriber
AAERT No. CET**D-520