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BEFORE THE
CALIFORNIA ENERGY COMMISSION

In the Matter of: ) Docket No. 15-IEPR-05
2015 Integrated Energy Policy ) Lead Commissioner
Report (2015 IEPR) ) Workshop

Lead Commissioner Workshop on
Strategies Related to Data for Improved Decisions in
Existing Buildings Energy Efficiency Draft Action Plan

CALIFORNIA ENERGY COMMISSION
HEARING ROOM A, 1516 NINTH STREET
ART ROSENFIELD HEARING ROOM
SACRAMENTO, CALIFORNIA

TUESDAY, APRIL 14, 2015
10:04 A.M.

Reported by:
Peter Petty
APPEARANCES

Commissioners Present
Andrew McAllister, Lead Commissioner, IEPR Committee
Robert Weisenmiller, Chair, CEC
Karen Douglas

Also Present at Dais
Ken Alex, Office of the Governor

CEC Staff Present
Heather Raitt
Martha Brook
David Ismailyan
Erik Jensen
Daniel Johnson
Consuelo Martinez
Abhilasha Wadhwa

Also Present (*by phone)
Guest Speakers
Ethan Elkins, UC Berkeley
*Sean Randolph, BACEI
Michael Murray, Greentech Leadership Group
Matt Golden, Efficiency.org
Chris Burmester, Energy Solutions
Chris Villarreal, CPUC
*Robin Mitchell, LBNL
Ronald Mohr, County of LA
Barry Hooper, City & County of SF

Panelists
Manuel Alvarez, Southern California Edison (SCE)
Mark Podorsky, (SCE)
*Jonathan Changus, NCPA
Jan Berman, PG&E

Public Comment
George Nesbitt, HERS Rater
Charles Cormany, Efficiency First California
Bill Knox
Debra Little, AjO
Matthew Hargrove, California Business Properties
Amy Reardon, CPUC
Chick Bornheim
Steve Uhler
Michael Nguyen
Kevin Messner, Association of Home Appliance Manufacturers
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MS. RAITT: Good morning, and welcome to the day's IEPR Workshop on Existing Buildings Energy Efficiency Draft Action Plan, Data for Improved Decisions. I'm Heather Raitt, the Program Manager for the IEPR.

I'll begin by going over the usual housekeeping items. Restrooms are in the atrium. A snack room is on the second floor at the top of the atrium stairs under the white awning. If there's an emergency and we need to evacuate the building, please follow staff to Roosevelt Park, which is across the street, diagonal to the building.

Today's Workshop is being broadcast through our WebEx Conferencing System, and parties should be aware that you're being recorded. We'll post audio recording on the Energy Commission's website in a few days and the written transcript will be posted in about a month.

Today, we have a wide variety of speakers and various opportunities for public comments. We encourage Workshop participants to make comments today, but also to be brief, as we have a very full Agenda.
We're asking parties to limit their comments to three minutes to insure that the maximum number of participants have an opportunity to speak. We will take comments first from those in the room, followed by people participating on WebEx and, finally, from those who are phone in only.

For those in the room who'd like to make comments, please fill out a blue card and give it to me. When it's your turn to speak please come to the center podium and speak into the microphone. It's helpful to also 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, and we'll either relay your comment or open your line at the appropriate time.

For phone in only participants, we'll open your lines after hearing from the in person and WebEx commenters. If you haven't already, please sign in at the entrance to the hearing room.

Materials for this meeting are available on our website, and hard copies are available on the table to the entrance to the hearing room.

Written comments are encouraged and due on
today's topics on April 28th. The workshop notice explains the process for submitting comments. And with that, I'll turn it over to the Commissioners. Thank you.

COMMISSIONER McALLISTER: All right. Well, thank you, everybody, for being here in person and on the phone and on the web. Thanks, Heather.

I am very excited to kick off this Workshop and very interested in what we talk about during the course of the day. Many of you know that AB 758 is a current activity at the Commission and broader conversations that we're trying to stimulate around the problematic of how we upgrade -- how we get our existing building stock improved in terms of energy and water performance.

In my view, this is one of the most important conversations that's happening in the state at present. It is an area we have to figure out how to do better if we are going to meet our long-term climate and energy goals.

And data is really the fundamental currency that we need more of in order to stimulate the marketplace at all levels to get this job done. You know, the state can do a certain amount and certainly has done a lot, both in voluntary programs
and direct regulations, and lots of different initiatives over the last 30-40 years.

We're at a point where we really -- the scale of the activity needs to increase in a way that really is only doable with private capital. So we have to enable the marketplace, activate the marketplace, by creating the foundational conditions for it to figure out what it can do better and how it can be cost effective and get out there and get the job done.

So you know, as I say often, you know, the state does not have the white trucks that are going to run around and install stuff in existing buildings. That has to be the marketplace. It has to be private capital, and so that the vendors and service providers have to figure out what they can sell and then they have to have the conditions to be able to go out there and sell it.

Consumers need better information to make better decisions, as well. So really, we're going to be talking about the structure of this today, as there are some interesting speakers to sort of paint the picture from various perspectives about what is possible with data, what's happening now, what's possible and where we could go as a state.
And then we need to talk about the sort of limitations and what barriers there are today that we need to work on and work through. And there are plenty of those. And staff is going to talk about the AB 758 Action Plan.

Really, we're talking about Strategy 2.1, which is Data for Better Decisions, and we're talking about both from the -- well, really, from the customer perspective, from the marketplace perspective, that is, service providers, contractors, et cetera, from researchers, as well, and then finally, policymakers.

And so all of those perspectives, or all of those sort of use cases, as varied as they are, need to be part of this discussion, because they all have to work together.

With that, I think I will welcome, Chair Weisenmiller is here. Really gratified that he could be here. Commissioner Douglas, also, both very interested in energy efficiency, and I think that's representative of why this is so -- the fact that this is so critical for the policy environment going forward.

And even to highlight that more, we have Ken Alex from the Governor's Office and OPR, to help
us kick off the day and orient the discussion in the
way that's most helpful for his world and for the
policy environment, in general.

So let's see. I guess I will go, who
first? Go, Ken, why don't you go ahead. Yeah,
sorry. Sorry I'm putting you on the spot here. Is
that okay?

MR. ALEX: No, we're good.

COMMISSIONER McALLISTER: Yeah. Yeah. Our
distinguished visitor here to our Rosenfeld Hearing
Room.

MR. ALEX: Thank you.

COMMISSIONER McALLISTER: Thanks for being
here.

MR. ALEX: Thank you, Commissioner
McAllister, and thank you very much for the
invitation to be here this morning.

First of all, I want to commend the
Commission and Commissioner McAllister in particular
for taking on this issue. He's been working on it
for quite some time and it is, for me, a hugely
important issue.

It's central and essential to how we make
progress on energy efficiency. The Governor has
laid out some very aggressive goals around climate
in the 2030 time frame, which we'll be hearing more
about from this Commission and from other state
agencies in the near future.

But three of his key goals from his
inauguration speech for second term were 50 percent
renewables by 2030, reduction of use of gas and oil
in transportation sector by up to 50 percent by 2030
and a doubling of energy efficiency in buildings by
2030.

These are central to the Governor's vision
for how we deal with climate change in California
and beyond. And we have a real challenge, as the
758 Draft Strategy identifies in really making
progress on energy efficiency.

And as Commissioner McAllister just said,
part of getting there is through transparency and
data availability around baseline and current usage
and all the other things that we know are available
if we can get them out there.

I have to acknowledge some amount of
frustration on this topic. I have been working on
utility data since the energy crisis of 2001. I was
at the Attorney General's Office until about four
plus years ago, and it has been a struggle in that
context and it continues to be a struggle from a new
context. And I want to say, it's time for a change.

We really need to make it clear that privacy can be protected. We have the tools and we'll hear about some of that today and the mechanisms. We need to provide this data in a usable form and we need to do it very soon.

I think the effort of LADWP in the Los Angeles area, in conjunction with UCLA, establishes this. It makes it clear that this data can be provided, that privacy can be protected and that the public and the marketplace, and regulators and decision-makers, can have this data available in a way that's usable, understandable and viable.

So with that, I, you know, just really wanted to underscore the importance of this effort and to thank the Commission for proceeding.

COMMISSIONER McALLISTER: Thanks a lot.

CHAIR WEISENMILLER: Yeah, thanks. Thanks for being here, and I'd like to thank everyone for their participation today. Obviously, parts of the workshop will be pretty dense and technical, but this is a very important topic.

I think all of us have heard the term, "knowledge is power," and it's particularly resonant in the power industry that data are very important
for really good decision-making and transparent
decision-making.

Particularly when we're looking at existing
buildings, we're really talking about millions upon
millions of individuals making decisions, that
trying to understand how the various policies that
we have in place are really affecting those
decisions is critical.

But also, in terms of providing the
information to those, you know, 10 million or so
individuals we're trying to influence, to make sure
that they have the tools, you know, to understand
the consequences of what they're doing is important.

And so I think, but at the same time, we're
at sort of an exciting time in terms of technology
development and the opportunity to use that
technology in a data context to really influence our
policies and influence decision-making in this area.

And you know, it's something which, again,
thinking of the first Brown Administration, you
know, in terms of the computer capacity we had at
the time, frankly, is less than your iPhone that
you're carrying around.

So just in terms of the revolution, the
types of things that's possible at this point, this
is an area which, certainly, there's a lot of agreement within the administration, certainly between the Energy Commission and PUC.

And I think as we move forward on the action plan here we need a way to translate that vision into actions.

COMMISSIONER McALLISTER: Thank you, Chair Weisenmiller.

COMMISSIONER DOUGLAS: Yeah. I'll just quickly join everyone here in welcoming everyone to the Energy Commission for this Workshop. I'm here both out of real interest in energy efficiency in the 758 Action Plan, and also because, you know, in my time at the Commission I've become increasingly aware of how important data is to getting our work done.

And it's having more sophisticated systems for collecting data, analyzing it, sharing it, putting it together in useful ways to actually inform decisions, understanding how to use good data and information in the public process, and not only, in other words, for the Energy Commission to power its own analyses, but to really be able to talk to stakeholders in the marketplace and create a more transparent and informed marketplace.
This has been a real cross-cutting issue and an interest that Commissioner McAllister and I certainly share and have talked about a fair amount. And certainly, in our work in a totally different sphere on the Desert Renewable Energy Conservation Plan, I got to experience firsthand many, many, many different ways of using and analyzing data, and I prefer the better ones, and so -- as a general statement -- so I'm very interested in this topic and definitely have been looking forward to it.

COMMISSIONER McALLISTER: I want to just put a thank you very much, all of you, for being here and, you know, I hope you can stay as -- as long as you can, I hope you will, and participate in the discussion, because I'm sure we have some knowledgeable folks coming up to present and it'll be really good to sort of wring the most out of them while they're here.

So I'll thank them in advance for being wrung out. I guess, you know, a slightly bigger context even, you know, energy efficiency is now not the only demand side management tool that we have in our quiver or in our toolbox.

So in order for energy efficiency to meet its potential, and it is one of the top, one of the
three goals of the Governor and it is still top of
the loading order, and you know, it is the primary
resource that we need to go get to not only reduce
cost, but also, reduce that denominator of overall
energy consumption.

So it makes our overall sort of energy
planning easier going forward. It also needs to
work well with the other preferred resources we
have. So it needs to play well in the sandbox along
with storage and demand response and all the other
preferred resources that we have, generation and
demand side.

So that in and of itself is a motivation
for having much better information about these
resources at a much more granular level, and that
demands better data.

And I want to just caution us, also, as we
go through the day to not be too reductive when we
say the word "data." It means different things to
different people.

Really, what we're talking about is how to
unlock the knowledge that that data can enable. So
that inherently means tools to inform what to
provide data into, and then be able to extract the
right kinds of knowledge, ask and answer the right
kinds of questions that are going to help us at the policy, and you know, at the top level of policy analysis, but also down at the individual customer level.

And so how to unlock these various potentials and make sure that each customer, each consumer, really, each citizen is getting the kinds of information that they need to make better decisions that are in their own best interest.

And then to the extent we can, as policymakers, tilt the playing field towards the public interest, we want to do that. And again, we need better information to be the foundation for that.

So this is a very important discussion and I want to just thank everybody for coming. Really looking forward to the presentations and both staff for all their hard work on the Action Plan, and also, you know, our panels of experts that we have through the course of the day.

So with that, I'll pass back to Heather to get the proceedings rolling. Thanks.

MS. RAITT: Thank you, Commissioner. Our first panel is on Setting the Stage, and our first speaker is Ethan Elkind. Okay.
MR. ELKIND: Good morning and thank you for the opportunity to come speak today. I'm very pleased to be here on behalf of my colleagues at UCLA and UC Berkeley Law, and also pleased that Commissioner Weisenmiller maybe inadvertently gave a plug for our new report, Knowledge is Power. So I appreciated the affirmation that we hopefully chose a good title there for this report.

So most of what my talk today is going to be based on that report, and I'll describe a little bit of the process there of how we put that together. It's actually part of a series of reports that the two law schools, with the support of Bank of America, have released over the last six years on different topics related to climate change.

And we gather business leaders to help us get some insight as to what are the policies that California needs to put in place to help those specific businesses thrive, with the idea that these are businesses that are reducing greenhouse gas emissions and helping California achieve its environmental goals.

So these are just a few of the reports. Actually, these are all the reports. They're in PowerPoint animation style, and this is the report
that I'm going to be discussing today, Knowledge is Power, How Improved Energy Data Access can Bolster Clean Energy Technologies and Save Money.

And you know, when we set out to do this report, maybe to the -- sort of the comments that were made by the Commissioners earlier, we actually wanted to do something on energy efficiency.

And I talked to people in the energy efficiency field and one of the big people that I have worked with in the past on the finance side, he said to me, well, you know, actually, if you want to do something in energy efficiency we could really use help when it comes -- and at the time, it was about a couple years ago -- related to the California Solar Initiative data; that that rebate program was providing a really important data set for people on the energy efficiency side, what's going to happen with that data. This is really critical to the whole industry.

And that really opened my eyes, that you know, we can talk about data, as Commissioner McAllister said, this is really a means to an end. And when we put the report together and we said, this is energy data, and we went to our communications team and we wanted to, you know, sort
of get the word out about this issue, our
communications people told us, you know, don't say
the word "data," because that, you know, immediately
puts people to sleep.

Of course, none of us here in the room, of
course. But you know, so we try to think of
knowledge, statistics, information, et cetera, you
know. But the reality here is that it's about
communicating what data is a means to an end for.

And energy efficiency certainly is a big
one, but it's other technologies, as well. It's
really our whole clean technology sector. So when
we gathered these business leaders we wanted to have
a diverse group.

We had folks on the energy efficiency side,
but also, from the electric vehicle side, for
example. And we had -- I had an auto maker's
representative, someone from General Motors, who
said, you know, wouldn't it be great if we could
plug into the cars, the electric vehicles, the
tariff information, a real time tariff information
so that when you plug in your cars it's already all
set up to charge at the most optimal time.

And you as a consumer don't need to do
anything, but you really take advantage of those
services, and then, meanwhile, California can take advantage of having all these distributed resources. So that was one example on the electric vehicle side.

And certainly, in renewable energy and energy storage, if we were much more transparent about the distribution grid and those needs within the distribution grid, you could then have energy storage developers, renewable energy developers, really know where is the most optimal place to cite these resources.

And with utilities being more transparent about that and perhaps even creating a market at the distribution level to help third parties, you know, understand where they might be able to add value, it would provide huge rate-payer benefits, potentially, and also, major reductions in greenhouse gases, as well, as another possibility. So it's important to connect, I think, energy data to what the ends are that we're trying to get to in California.

So in our report in discussing with people, you know, as I mentioned, this covers a whole range of topics. I always like to show this slide here. This is California's greenhouse gas emissions pie chart.
And you could see, you know, transportation, electricity, how we heat our buildings, all these things are affected by data. So to really boost the clean technology industry you've got to give people access to the information to be able to let the market work.

And also, as we think about those long-term goals that Director Alex mentioned, Ken Alex mentioned, in terms of our 2050 goals, we're going to need to see major reductions in our greenhouse gas footprint per capita. So this slide shows where we're going out to 2020. We need a reduction of about one percent per person, per year to meet those 2020 goals. But if we have any hope of meeting those 2050 goals, we're going to need a reduction of about five percent, per person, per year, of our carbon emissions.

So that's a major, dramatic decrease that we need to see going forward, and it can really only happen, particularly with major advancements in energy efficiency. But we're going to need to be as proactive as we can to make sure that we have market activity to help us meet those goals.

So in terms of the report findings, we've
looked at two different types of information that would be helpful to boost these clean technology sectors, and one of those is a customer facing type of data, but the other is the more utility side data. So I'm going to just break out those data needs in those two categories.

So on the customer side when we talked to these folks in the room and we asked, what are some of the most important data that would be useful to really empower customers, both on the residential and commercial side.

And obviously, utility meter data was a big one. So really, getting access at 15-minute intervals, you know, close to real time type data access, that would be very critical for a lot of these individual building owners to understand how they can best save money, by understanding their meter usage.

Similarly, historic energy audit data, this may be more useful and more practical on the commercial side, but if you come into -- you don't buy a new building, a new commercial building, and if there's been previous historic -- previous energy audits, it would be really valuable to know what's been done.
What was the building energy profile before you can in and where has the progress been made? So we know that a lot of those energy audit plans are filed with utilities, for example, and it'd be nice if we could have a way to make those accessible to the building owner themselves.

COMMISSIONER McALLISTER: Ethan, could I ask a question? I'm going to try not to jump in too much, because we have a lot of good stuff that I want to hear.

But did the idea come up of something like -- I mean, I think of it as sort of a -- you know, you can -- your CarFax, you know, on your car you can -- I mean, your home is your biggest asset and your car is your next asset, right.

So this idea that, you know, you have a VIN number equivalent for a home, for a building, and it's sort of, you know, you do that for your car. You put in the VIN number and you get the whole accident report and, you know, you see if it's salvage.

You know, you see what, you know, what work it's had done and the essential elements of the history. Is there any -- did that kind of topic ever come up in terms of buildings? You know, they
have a long life and they have a history and there
is some permit record and things like that.

MR. ELKIND: So no --

COMMISSIONER McALLISTER: Have you ever
talked about that?

MR. ELKIND: Yeah, but nobody sort of put
it in that -- I like that type of, you know, frame
of looking at it, that analogy, with the CarFax.
And you know, no one's said that exactly, but I
think that, really, we're describing a lot of what
you're saying, that there is essentially, you know,
a repository of all that information, of the energy
audit data, and you know, and you could couple it
with this other utility meter data.

We certainly talked about the need for data
centers. There's some debate about whether it makes
sense to house it in one place or in multiple data
centers, but that could be a nice role for that type
of data center where you could plug that information
in.

And I think probably the majority of people
felt like multiple data centers might be useful. I
can go into that in a minute, but I think that would
be a useful thing, I think a great role for the
Energy Commission to help encourage that kind of
disclosure, because in this case it's about, you
know, it's about a building somebody owns.

We're not talking about some sort of
privacy invasion, because you know, however people
used to use energy in a building shouldn't be a
private matter if you now own it. So that is
definitely I think a very promising area we could go
in, in California.

All right. We also talked about the
Internet of things, you know, just the NIST,
thermostat and that kind of -- you know -- the home-
networked appliances and how it would be really
helpful if consumers could actually access that data
that's being generated that currently seems like
it's going to be slated into private hands --

COMMISSIONER McALLISTER: Right.

MR. ELKIND: -- for those companies that
are -- that have those products. And how critical
that would be, of course, for demand response and
for being able to moderate your energy usage
according to a market signal.

Also, getting tariff data so that customers
can get a sense of how they're actually being
charged, and this is the kind of thing that you
could plug into -- no pun intended -- but you could
plug into an electric vehicle to give them access to
know when best to charge as a sort of a sync or a
smart charging kind of demand response activity.

And then also, information on segmenting
customers by their usage and their climate zone so
people have a sense of exactly which climate zone --
if we can target programs and policies towards
certain climate zones and certain types of users,
that that would also then make our policies more
effective, as well, because then we could target
these incentive programs towards those areas that
are likely to have the best, sort of best bang for
their buck in terms of efficiency and other
distributed, renewable and other distributed
resources.

And then finally, it would be really
helpful to have a sense of our track record to date
on a lot of our efficiency policies, so being much
more transparent to help some of the advocacy groups
out there understand how we're doing in terms of our
efficiency policies, what are the outcomes that
we're getting and are we spending rate-payer funds,
in particular, in the most cost-effective ways.

So on the utility facing side, kind of data
that people talked about, distribution,
infrastructure, as I mentioned earlier. So AB 327, which passed in 2013, does require that the Public Utilities Commission utilities come up with distribution infrastructure plans.

That might be a really great opportunity to possibly leading towards some kind of a market where you could actually have some of these third party software, hardware vendors come in and help work with the utility.

How do you value this particular asset? Where are you facing challenges in your distribution grid? And particularly, as we see more solar coming online, it's really important that we get it right at the distribution level.

And we may need to start to move in that direction of transparency, simply just for reliability purposes and also, to help bring down costs for ratepayers as we need to be more innovative and dynamic in terms of how we operate things at the distribution level.

And the same is true for transmission infrastructure, as well; so a similar type of thing, although from our participants at the convening it did sound like we're doing a little bit better on the transmission side of things in terms of access
to third party vendors and such.

And then, of course, it would be really helpful if we could have somewhat of what Ken Alex was discussing, more aggregated consumer behavior data where we get a sense of how consumers are using data, at what times -- I'm sorry -- using energy and at what times.

And then that would be helpful to really target our efficiency programs, but also target -- help third party vendors really know where the needs are. And I should say, you know, there is a tension here where we don't want to necessarily just make it easy to open up customers to being marketed nonstop.

So you know, our report didn't get into that, but I just wanted to sort of flag that as an area where, you know, it's not about, you know, exposing Californians of a certain demographic ZIP Code to a ton of, you know, ads from Solar City or whatever it is.

But you know, at the same time we do want to really help these industries be as focused as possible, and where there are people who would fit the profile really benefit, we want to make sure that they get access to information about what's available to them in terms of, you know, becoming
cleaner and more efficient with their energy generation and usage.

And then finally, looking at aggregated customer energy data, as well. So you know, again, looking at in a non sort of privacy, you know, violating type of way, but I think that UCLA, LADWP pilot that Director Alex mentioned I think is a great example of how we can do this.

You know, we can balance privacy rights, but anonymize this energy usage patterns in such a way that really help the market, you know, be able to do its thing without hopefully jeopardizing those privacy interests.

So we asked everyone, look, those are great, you know, these are great to get a sense of what data you would like, but what are the challenges that you'd see to being able to get greater access to this data.

And so the big one that came out was the lack of incentives for utilities to provide access to this data, and the big challenge, of course, here is that utilities don't have a strong need to antagonize people who care about privacy concerns. So that's one of it.

Some people felt that there's sort of a
profit disincentive here, because for a lot of utilities they're not going to see a real value in empowering third parties that could potentially undercut some of their revenue.

And then beyond that, it costs money to do this. So if they're not going to be able to recover some of those costs of data disclosure and data harvesting, that's going to be a challenge.

So there's the lack of funding barrier in terms of who's going to pay for these data centers, who's going to pay to, you know, comb through the data, make sure that it's secure, et cetera.

And then, of course, the customer privacy concerns always looms out there and it's not just concerns. It's the constitutional and statutory provisions that have to be balanced, although I do think that there's a lot of leeway there and with new mechanisms we can address those concerns.

And then of course, it's always in the news, but cyber security fears. If you're data's out there, whether, you know, it's Home Depot credit card charges or, you know, Sony Pictures with the movie about North Korea, you know, this is going to loom very large and it's very important that we get this piece of it right, because if we're asking
people to, you know, to even be part of an anonymized type of program, we need to assure them that this is not going to be something that's abused in any way by malicious actors out there.

And so just quickly, I'll go through some of the solutions that people suggested to address some of these challenges. So you know, a big one would be to put in place a utility cost recovery mechanism so that utilities will get reimbursed, recover their cost for this data collection, access, et cetera.

And then we'll need funding for these secure energy data centers. So we'd have to find a way to make sure we can find revenue for that. It could be that these things essentially pay for themselves from a ratepayer perspective, that these data centers could unlock such savings that we could go forward with funding them out of ratepayer funds.

So that's something to keep on the table for sure. And then the development of an ad hoc tariff tech group to really get at these issues of 15-minute interval data in machine readable format that I noted was in the AB 758 draft plan, and that kind of a working group, and you know, maybe starting on this issue, but there may be other
issues down the road, really getting the experts together to start to troubleshoot some of these things.

COMMISSIONER McALLISTER: Did you, just on that issue, on the machine readable data or tariff data. So did you identify any issues, sort of statutory issues or, I mean, my sense is that these are already public.

They're just in a format that onerous to deal with, but that they are public. And so any effort to make them actually accessible in practical terms wouldn't have a statutory problem. But I guess I wanted to just make sure of that from your perspective.

MR. ELKIND: Sure. So you know, to my knowledge I don't see any challenges with that. It seems more like just kind of a logistical challenge and more of a cost incentive challenge. I mean, we did not spend a lot of time researching to see if there is a legal issue out there, but that was not flagged for us.

And I don't see any reason why this couldn't be something that, you know, particularly when it's someone's own data why we couldn't, you know, get in there and make that a more, you know,
accessible type of a thing that you could then give
cconsent to someone else to access.

So at the very minimum, that kind of
process I think would really benefit and doesn't
have any legal challenges, from what I can tell.
And then, finally, you know, the Commissioner
McAllister, your point earlier.

If we could have some sort of requirement
for that historic energy audit data out there that's
currently, you know, unfortunately I think in some
cases just sitting in a file folder somewhere. If
there's some way to make that digital, to make that
accessible, that would I think really help, I think
particularly in the commercial side, get a better
handle on the energy patterns and where the

efficiency benefits might be.

COMMISSIONER McALLISTER: Are you thinking
that that's somehow linked to having received a
ratepayer incentive? So if a ratepayer, you know,
funded part of the assessment or, you know,
participated in a program or something, then that's
-- you're sort of hooked to say, well, that ought to
be made public, or is there some broader application
of this disclosure?

MR. ELKIND: So I think that could be one
way to do it. And of course, you know, going forward as energy audits, you know, happen in the future, I think it'd be great to build in, you know, that is probably the most effective way to do it, you know, thinking about going forward, that we build in a mechanism to make sure that these are in a standard format, a standard, you know, readable, digital format, and that there is a place to put them.

So that would be easy, I think. Well, no, I shouldn't say easy, but that would be ideal going forward, and then in terms of past energy audits, you know, then I think we may want to try to figure out some sort of incentive program and, certainly, a cost recovery mechanism to make sure that happens.

And then I should also say we do have a right to our energy data in California, but I think we can do more to really enshrine improved access to energy data. And that's a key right that I think if we could kind of have as part of our overarching, almost philosophical approach to these issues, that that would be really helpful to put some more umph, particularly when you run into headwinds from utilities, privacy advocates, cyber security fears, et cetera, that we make a strong statement that
people should be able to access their own energy data as easily and efficiently as possible. So those are just some key highlights. I put some hard copies of the report out there if anyone wants to grab them. And for those on WebEx, all these reports are available on both the UC Berkeley and UCLA Law website, if you follow the address here on the screen.

So unless there are any questions, thank you very much.

CHAIR WEISENMILLER: Yeah, I have one, and I had -- was on a panel once with the Canadian Minister who's responsible for basically their question of who owns the data, you know. And from her perspective it was very clear these data are owned by the customers. And certainly, SDG&E has affirmed that as a matter of policy. Legally, who owns it?

MR. ELKIND: So I would agree that this is data that the customer owns, but it doesn't seem like in practice we really treat it that way. So you know, again, similar to the question that Commissioner McAllister raised.

It's not something that, you know, we spent a lot of time investigating legally, but that's my
understanding, that this is -- this should be customer owned data. They use it. They generate it and we ought to have policies that match that understanding, that legal context.

CHAIR WEISENMILLER: In my various dealings over the decades it seems much more like the utilities believe that they own the data.

MR. ELKIND: So it does, I think, depend on which data you're talking about, right. So if we're talking about customer generated data, then they would own that. You know, utilities may have a different argument if it has to do with their grid infrastructure.

CHAIR WEISENMILLER: Yeah.

MR. ELKIND: So you know, that may be a more difficult situation. But again, since you have, you know, regulated monopolies and we have a strong public interest in making sure that ratepayer funds are spent effectively, I think that provides a strong opening and say, you know, we don't want to necessarily, you know, jeopardize your business model, but at the same time there are real inefficiencies here and there's real benefit to ratepayers to being more transparent about how you value resources.
And we should be trying to determine the most efficient way to do what the grid does, and we should be transparent in the data to allow as much innovation as possible to happen.

CHAIR WEISENMILLER: I guess the other question is just, realistically, if you -- the state recent history has been marred by a series of software upgrade failures. I mean, even simple things like payroll systems we seem not to be able to pull off.

And part of it comes back to, I know, talking to like President Piccard, we'll all scratch our head going how do you deal with, you know, someone, the new, bright IT person deciding do they work for Google, PG&E or the PUC.

And that's a pretty hard space to be competing in, even say for PG&E in this era, much less state service. So I mean, again, how do we, you know, really upgrade our systems and our capabilities there to be effective in these areas?

MR. ELKIND: Well, I can't speak from an HR perspective in terms of the best way to recruit people. But I do think that, you know, the more dynamic we can make the provision of electricity and energy in the state, the more dynamic that the state
can respond to the innovation that's happening on the private sector side, I think the more appealing it becomes, you know, to attract bright people to a dynamic space on the sort of public sector side.

But I think, you know, the advantage here is a lot of these private sector companies can do a lot of California's work for us and save us money in the process. And you know, certainly, we don't want to go too far to down the road where we start to get into the negatives of that, you know, loss of control and potential market abuses and so forth.

But at the same time, you know, we do have an opportunity to take advantage of all this innovation that's happening on the private sector side. And you know, we're -- and also getting access to that data may mean that we really want to be rethinking some of our incentive programs.

We think about energy efficiency programs. You know, we think it's kind of a clunky system that we have now, very fragmented, very sort of proscriptive. You know, you get a rebate based on, you know, x number of steps you have to take.

You know, we could take advantage of all the innovation that's happening by being more transparent with the data and maybe moving towards a
performance based, outcome based type of incentive structure for energy efficiency dollars.

And you know, to answer your question I think, you know, we can take advantage of that innovation on the private sector side and some of those smart data, data wonks, which I'm not one, and you know, allow them to really give them a focus direction so that we can use those efficiency funds in the most effective way possible, because I think, you know, the current system that we have, especially on the energy efficiency side, doesn't seem to be giving us the returns that we ought to be getting.

And if we move towards outcome based, taking advantage of data, taking advantage of these third party software companies, I think we can make a lot more progress, because I think there's a lot of savings out there that we're leaving on the table, and a lot of savings that we're frankly not compensating people for, because we're not measuring it accurately.

So I think this, you know, improving the energy data access can really help us get out that and take advantage of the smart people that we have in the state here.
COMMISSIONER McALLISTER:  Thanks. So I wanted to build on that conversation a little bit. I mean, I guess, you know, now, data is this catchall word. It means lots of different things. And real time, interval data or even real time data, period, is not the same thing as, say, monthly aggregated or, you know, some other way of aggregating it.

I guess the, you know, the sort of ownership of the data and the access questions seems like they would vary along a continuum with what kind of data even within one -- even within a project specific context or a customer specific context.

But certainly, then you go levels of aggregation across customers or in geographical areas and then you get sort of up the chain of, you know, having privacy be less and less of a concern.

I guess, did you talk about the, you know, the sort of use cases in any specificity in terms of what the sort of practical, real dangers of sort of real -- the risks were, rather, in the privacy realm, say with, you know, monthly versus interval or whatever, that kind of data? I mean, did you get down into that level of detail?
MR. ELKIND: Not really. I mean, we --
definitely the more granular we can make the data,
you know, the consensus was that that's going to be
the most helpful. But we didn't get too deep into
specific use cases along those lines, although
Michael Murray was -- I know he's going to be
speaking later. Perhaps he might be able to speak
to that, because he was part of that group.

So we didn't get down to that level, but I
think, you know, all these different, you know,
levels of data, they do have different uses. But I
think, you know, the more granular you can get it,
the more beneficial, I think, for at lot of at least
these third party companies.

But certainly, even having, you know, less
frequent interval data, there still can be a role
for that and it may just be something as simple as
making sure that our incentive policies are directed
at least in the right, you know, general
neighborhood, if we -- you know -- we may not be
able to get down to more specific than that.

COMMISSIONER McALLISTER: Yeah, but you can
do a lot with practical knowledge generation with
less granular data, but you know, weather
normalization and, you know -- anyway, we don't need
to get into the analytical details too much.

But I guess my theme throughout the day is
going to, at least in part, be where there -- and
I've asked the utilities in various forms, and
hopefully, we'll hear some discussion about that
today. But certainly, we need to build a commonly
accepted knowledge base about what statute actually
says and where there are conflicts between statute,
regulation, decision at the various agencies, and
pick that apart.

Like, okay, well, if we want to go over
there, then what are the barriers and the conflicts
that we will encounter along the way, and have we
solved those. You know, I definitely don't want to
hear, like, oh, that can't be done because, you
know, the statute says x.

Well, you know, what would be necessary to
get over that barrier? Those are going to be kind
of the proactive message that we're going to hear
from me, and hopefully from others, throughout the
day. So I want to -- Heather, how do you want to
handle questions from the audience, too, or do you
want to wait between panels or?

MS. RAITT: If we can wait between panels
that'd probably be great.
COMMISSIONER McALLISTER: Okay. Great. So thanks very much, Ethan. So stay tuned for questions at the end.

MR. ELKIND: Okay. Thank you very much.

MS. RAITT: All right. Our next speaker is through WebEx, and it's Sean Randolph. I'll get your presentation up.

MR. RANDOLPH: Suggest you flip the slides?

MS. RAITT: Yes, I'll flip the slides. I'm just -- give me a moment here.

(Pause.)

MS. RAITT: Okay. Ready to go.

MR. RANDOLPH: Great. Thanks. Thanks everybody for the chance to connect with you today. Sorry I couldn't come in, in person. So I'm testing out the technology here.

So the timing for the conversation is very nice for us, as we just released this report yesterday, yesterday afternoon here in San Francisco. So I'm Sean Randolph. I'm Senior Director for the Bay Area Council Economic Institute.

And we're the, essentially, the research analytics think tank arm of the Bay Area Council. So we do independent, fact-based analysis on
economic issues impacting the competitiveness of the state's economy.

And we began working on this about a year ago in the belief that it's critical for the state to be investing in a 21st century infrastructure if it's going to be globally, as well as nationally, competitive.

We know that other places around the country and around the world are doing better than we are in that, and that it's something that needs to be addressed. And so if you'll go to the next slide, we worked with a panel of leading energy and telecom companies.

We decided to focus on those two sectors as being especially critical for the state; telecom because of the need to move the data, and on energy because of state energy policies that need to be implemented, and then how they come together through a smart grid.

We convened four expert panels in the course of the process, two each on energy and communications policy, two each on energy and communications technology, to get some insights into both the policy issues, but what was the potential of getting the right infrastructure in place as soon
So to kick this off, our belief has been that we need to be rethinking what 21st century infrastructure is, how we are moving and consuming information and energy. And we're seeing that a growing reliance on communication activity is going to require greater resilience and great reliability in the electrical grid.

We're also seeing that the energy sector is going to need communications upgrades so that information can flow now in multiple directions between consumers, utilities and different points that connect to the grid and all this is leading us into a focus on smart grid.

So next slide. So starting with the communications part, then I'll say a bit about energy since they obviously do connect, our point of departure was considering the digitization of the economy and it's being digitized at an extraordinarily rapid pace, even as we sit here and talk.

So total Internet traffic is expected to grow about threefold between 2013 and 2018. Every day there are more users. There are more devices. There's more traffic per users and the expectation
is there'll be about 64 times the Internet traffic volume by 2018 as was produced in 2005, and that is just a phenomenal amount of demand on the system. We're seeing demands for com activity arising out of the growth of mobile data, arising out of the use of mobile data is about 18 times the size of the total global Internet in 2000, which wasn't so long ago. We're seeing Cloud traffic likely to grow fourfold just from 2013 to 2018. So this is all happening as more and more facets of the economy are being digitized. Now, throw on top of that, and this will be resonant of the presentation you just heard, we have the Internet of things coming on, including consumer electronics. Vast censored networks are on their way. Infrastructure for communications from machine to person, infrastructure to car. We're also seeing the rapid development, very small still, but about to grow quickly, we think, in wearable devices, about 22 million in 2013, expected to grow to maybe 177 million by 2018. Industrial processes, as many as maybe two billion devices are going to need to be connected to each other within the next three to four years. So
all of this is being delivered, all these services,
we believe, in a marketplace that's changing very,
very rapidly.

It's basically 20th century infrastructure,
certainly from a regulatory process. You know,
phone and Internet services were previously being
delivered through separate structures by separate
providers. And now, the lines between
telecommunications and information providers are
being blurred by companies like Google and Skype and
others.

So next slide. So if we look at broadband,
then, right now we're not doing that great.
California as a state ranks about 18th nationally in
broadband schema speeds. In some places it's
actually quite good, but I think that relatively low
ranking is partly a function to say it's size and
geography.

In a small state it's easier to have
concentrated high speed service. You know, we have
a lot of rural areas in the state that are not well
served or under-served, and I think that kind of
dilutes our performance if you're ranking on a state
level. But there's obviously a way to go.

In terms of infrastructure, we're talking
about 21st century infrastructure. We could talk
about what that means, but there are advancements in
copper wire and coaxial cable, but especially
fiberoptic cables that can provide Internet speeds
up to maybe 100 times what traditional copper wires
can do.

We're seeing mobile broadband evolving into
an LTE advance standard that can achieve gigabits
speeds, and then we have some of the other hard
infrastructure, the micro cells, distributed antenna
systems that are providing better coverage, managing
usage on crowded networks.

So if we have this kind of infrastructure
in place on the most expedited basis possible, you
know, there are extraordinary opportunities for
leaders from California and for transformational
change across a really wide range of sectors.

We're seeing really significant
applications in agriculture with field sensors and
drone technology, education. More than 60 percent
of the U.S. schools don't have the adequate
connections for digital learning. Khan Academy,
things like that are coming on.

MOOCs are coming on. So digitization of
education is starting to get underway. Health, so
many applications coming on. Remote monitoring or chronic diseases by video can reduce, we believe, beds, days of care in facilities by as much as 40 percent.

There's the ability to share large files, like retina scans, x-ray, all around the globe for quick diagnosis. And I think we're only beginning to see the applications of that, including sensors, actually nano-level sensors that will go into the body and seek out malignancies and report back from inside the body. So sensors everywhere.

Public service. Intelligent street lighting is becoming more energy efficient. RFID text can be used for tracking garbage collection. And then you get to office environments. Growth of telework, holographic conferencing coming.

About 13 million people worked from home in 2010. That's up from 4 million in 2000. So enormous digitization across sectors, transformational potentially across a lot of different industries, and really affecting people's lives in some fundamental ways.

Next slide. So we're sort of getting into the policy area here. In the report we try to communicate, first, so what is the economic
potential. Why should we be as a state invested in
and focused on getting the right infrastructure in
place as quickly as possible?

And then what do we need to do to get that
to happen faster. Why isn't it happening as fast as
it might? Well, there's a lot of things to talk
about, of course. Local ordinances can slow
projects, create additional costs.

A lot of cities don't even know who their
conduit is, but by identifying where a conduit is
and sharing that with private companies, using
things like utility poles and lighting poles,
there's ways to aggregate and better manage where
some of this communications infrastructure goes in.

CEQA can be a factor. Communication stuff
is being, going through the CEQA process like any
other kind of more disruptive, heavy infrastructure.
We need some more innovative permitting approaches
to how CEQA works through for telecoms.

And one of the suggestions we've made is
the idea of really enabling as network task force
that could do a number of things, in multi sectoral,
public and private, like we think something like
that could help educate local leaders on how to
identify key infrastructure, could help implement
and identify standardized permitting application processes across the state, sharing best practices for working with Internet service providers, and possibly helping to prioritize infrastructure investment needs across the state.

So just shifting for just a moment to the energy side, because we did look at that closely, as well. So we're really seeing a huge change with the state's policies pushing toward more renewable energy, lower greenhouse gas emissions.

Where once we were relying on centralized powerplants to meet the demand, now, we've got utility scale renewable facilities. We have behind the meter generation playing a much greater role in meeting demand and meeting the state's policy goals.

AB 32, of course, is right there at the top of the list. We're looking, as we all know, to push greenhouse gas emissions back to 1990 levels by 2020, 15 percent reduction from business as usual. The RPS, pushing toward 33 percent by 2020. We're about 23 percent today.

So these are really critical drivers that we think getting this kind of infrastructure in place is going to help to enable, or it's critical to enabling it. And again, the demand on the system
from the successful implementation of these policies is really tremendous and growing. So the price of installing solar PV in California has dropped by 50 percent in six years. Net metering, feed in tariffs are incentivizing renewables production, and we're leading the nation in solar installations, about 240,000 distributed on site solar systems. And we're seeing customers in their homes looking for more options to control their energy use. Again, this is more demand on the system, on the communications system. Electrical vehicles, about 40 percent of nationwide sales are here in California, aiming to have 1.5 million zero emission vehicles by 2025. So all that is going to add even more demand to the grid, which could nearly double average residential usage, although they could all go back to storage. So all these changes have led to new technologies, new strategies to better manage electricity use, to integrate more renewables into the grid, help managing supply that is going to become more variable. And so that does get us, we identified it in the report, technologies, including investments
in battery storage, smart grid infrastructure, called Smart Meters, energy efficiency, demand response programs, EB charging infrastructure.

Next slide. So on the solar, I was going to skip a couple of things here, but again, we're leading the nation in solar installations. Twenty-three percent of electric sales via renewable power are in California.

The trick is, it's variable, and that -- it's creating a need to be able to move power in multiple directions as more and more power is coming from generation on residential rooftops, generation buildings, utility scale generation, and that's posing a grid for -- a challenge for grid operators and utilities.

And the demand doesn't always correspond to supplies in the state's remaining large power suppliers. So things may need to be turned off and turned on. So we're seeing a range of solutions out there, and again, in this report we haven't tried to be overly proscriptive, but battery storage is already a big key, PUC mandating 1.3 gigawatts of storage by 2020.

EV grid integration plans can lead to better control of EV's use and their impact on the
grid. We're seeing more use of smart grid pilots testing home area networks, allowing for smart appliances and demand response programs, shifting time of energy use.

Where to use practical grids, universities, hospitals, businesses. UC Irvine operates maybe the most advanced in the country, and of course, a demand response. And the next slide, this is the next to the last.

So the good news is that California's leading the nation in advanced metering, saved customers each between 40 and $70 per year. But the data from these meters could be used across utility silos, and acts as a platform for improved services.

So I think this connects that to the last presentation. There is customer choice. Customers are starting to modify behaviors to control costs. They've been doing this for a while, but with the technology this is going to accelerate, we think.

There can be greater transparency. Things like O Power and NIST already have an impact here, allowing users to control their energy use, as well as to better understand what their total production and use is.

And then it's important, I think also, to
tag the issue of resilience that this technology can help support. Between 2003 and 2012, the U.S. suffered almost 680 weather related outages of durations we think can be reduced if utilities know where the power is off immediately. So I think resilience is a big part of the story.

And finally, the last slide, where we want to connect, we think there's a need to connect all this into policy goals. One question concerns rates. They were created for really a one-way flow of electricity.

The cost to maintain wires and connection account for about 45 percent of energy bills. And so there's a need to disaggregate, fix some variable costs so that customers can better understand their time variance usage, you know, throughout the day.

The CPUC is already on this, but it's important to incentivize the adoption of energy storage technologies, which we think is a key to the whole puzzle.

We think that there is a big opportunity to draw on the data that's being generated by these technologies to allow greater customer engagement, give utilities better visibility of behind the meter generation to predict a full supply and demand on
the system, and to bring about a more full usage of the data that the communications technology will enable in the grid to provide better services across, you know, many different kind of applications.

So the bottom line to the report is we've tried not to be very prescriptive in detail on very specific policy initiatives. The Bay Area Council has a 21st Century Infrastructure Task Force, multiple large and smaller companies across the energy and communications that will be thinking about the specific kinds of policy initiatives that should be prioritized.

But we've basically produced this study with the idea of focusing on the importance of accelerated investment in these technologies, both for energy use and for communications, especially through the Smart Grid, is something that's really critical to California's future economic competitiveness.

COMMISSIONER McALLISTER: Okay. Thanks very much, Mr. Randolph. That was very helpful. I think we're going to -- in the interest of time here, we're already running a little bit behind, so I'm going to go straight to Abhilasha, I guess, with
the next presentation about the action plan itself.

Mr. Randolph, if you could hang out in case there are questions, that would be great, after this next presentation.

MR. RANDOLPH: Right.

MR. WADHWA: Thank you, Commissioner.

Thank you, Sean. My name is Abhi Wadhwa. I'm from Existing Buildings Unit and Energy Commission, and I just wanted to give a really high level, quick overview of how we see data in the Existing Buildings Action Plan.

And really, as Commissioner had mentioned, in the kickoff Workshop the way it is envisioned is we see data as the catalyst, as really the cytoplasm that drives many of the strategies, and I want to give an overview of which strategies we see it directly influencing.

Really, it's about consumer, consumer, consumer first, and providing access to the consumer, or helping them drive their decisions, providing data access to market actors and also policymakers. Strategy 2.1 talks about establishing the framework under which this data should be collected, the protocols which would need to be standardized.
And I believe Ethan had spoken about it earlier and Sean touched upon it, too, how in any industry it's really necessary to have standardization of how we are talking to each other. If we are all talking different languages then very soon we'll be talking past each other.

There are some issues which have been lingering in the background for a while now, and I believe the time has come. We are at a juncture where we face them head-on. Mapping meters to physical buildings is one such issue which I believe comes across in many of the programs we're running currently.

And as one of our strategies we propose to resolve this and we would be requiring utilities to map meters to the building locational addresses so that we can roll that into a cohesive infrastructure, not just for benchmarking, but for data access in general.

And then improve access to energy use data and analytics. It's a strategy which is not a standalone strategy by any means and would tie closely to M-E-N-O (phonetic), for example.

In this world of over-bombardment of data, the last thing we want to do is overwhelm the
consumer with data that they don't need, but at the same time providing it to them at their fingertips when they do need it.

And at the same time that same data works for them in the background from the market actor side. Standardized process for local governments to access data. A lot of good policies, a lot of good ordinances come out of local governments.

And again, when the language of speaking is consistent we are not doubling the efforts of exchanging this data and we are leveraging each other's efforts.

Standardized utility rate information, again, as Sean touched upon this earlier, you know, connecting rates to policy goals is key to realistically achieving these goals. And right now, even something simple as having a consistent format for all the different utility rates, all the small, municipal utilities we have, is not something we have achieved so far, so looking at that in this strategy and taking on that role.

Project specific measured savings. So from my perspective it's always easier, just as a fundamental rule of statistics, it's always easier to zoom out, but the basic unit at which the data is
collected determines the quality and reliability of the larger picture.

So to have this granular, you know, local specific anonymized information for program participants, which you know, allows us to make more informed decisions for programs going forward, and data access for policy planning and research, which is the final one where, you know, data is really our pulse, our ears to the ground, and it helps us course correct, see what is working, what is not working.

Establishing energy use baselines, I believe Martha will talk more about this, again, ties into geographic specific, vintage about buildings, just having some basic information about buildings, which helps us establish their baselines, and developing data collection protocols and forecasting methods.

The idea is that through the IEPR process in demand forecast we already use a lot of this energy efficiency data, and we believe that with some strategic thinking we can tap into this for program purposes, as well, and allow some of this access wherever it's anonymized and accessible for consumers.
So really, as I said, we think of data as the cytoplasm, which is the background of so many strategies. But first of all, to secure this data, to have a house for it, we need to establish a data infrastructure.

So while Martha will speak about what elements of this data we are looking at, like how we would be using it, I want to talk about what we just said. This data infrastructure is Strategy 2.1, we look at protocols which are being developed nationally, like standard energy, efficiency data, exchange protocol, the building energy data, exchange specification and Green Button.

These are all national efforts which are coming up, aligning ourselves with them, seeing how we can benefit from them, standardizing utility rate tariffs, meter matching to buildings, this really forms the framework under which we start collecting this data and disseminating it.

First Strategy 1.2 is benchmarking. We establish thresholds for benchmarking in the action plan. I believe the proposed threshold is 50,000 square foot for nonresidential buildings. Looking at that, how it would feed into reliable assessment tools.
We make a clear distinction between assessment tools and asset rating tools. While assessment tools speak to specific occupant groups and how their behavior affects their specific usage, asset rating tools are looking at the property as an asset, as a standalone asset, and ties into property valuation and real estate industry, which just calls for coming up.

The benchmarking would also feed into program data and would drive innovation when this data accesses easy and reliable assessment tools. We see them as the drivers for a performance driven industry.

Matt Golden is here and he will talk about, you know, his efforts with open E meter and Caltest and CalTRACK. We see that as valuable to providing industry a very hands on feedback to correct itself.

And asset, you know, developing reference methods for asset rating tools, it really embeds, it gets embedded in the value of real estate, providing a standard way to look at properties, which is reliable.

And assessment tools, we see them as feeding into goal five, which is about finance, mainly, and the Investor Confidence Project. We
feel that currently, in order to get to scale, the
tools need to be really reliable so that the savings
are risk free, or minimal risk, and this is what
would result in, you know, scale-ability in the
finance sector.

So with that, I'm going to leave it off. I
apologize for my hoarse voice today. I will let
Martha take it from here.

COMMISSIONER McALLISTER: Thanks, Abhi.

MS. BROOK: Oh, I don't actually think I'm
on the Agenda next, but that's all right.

COMMISSIONER McALLISTER: That never
stopped you before, so.

MS. BROOK: Exactly.

(Laughter.)

MS. BROOK: But since I do have the mic, I
did want to say to all the speakers, thank you so
much for coming. I know that you juggled your
schedules and changed your plans and donated your
time, and we really, really appreciate that.

We are -- I don't want to say beggars can't
be choosers, because we were definitely choosy
about asking you to participate, and if I don't have
the opportunity now, I wanted you to know that we
really appreciate it. Thanks.
MS. RAiTT:  We go onto the next speaker, or
did you want to take comments now?

MS. BROOK:  So this is the end of the
setting the stage section?

COMMISSIONER McALLISTER:  Yeah.  So we
wanted to "set the stage" with these first few
presentations.  We're 15 minutes or so behind
schedule.  I kind of feel like, let's see, rather
than go to questions that seems to always be our
downfall is to go on the with discussion and
questions and stuff.

And so I guess I just want to say that we
definitely will have time for questions along the
way.  Please note them down and put them in the most
concise way you can and we'll -- so we can get them
on the record.

We don't have to finish all these
discussions today.  There's a comment period that
will go on for some time, and in fact, your written
comments, if you can be, you know, as sort of clear
and cogent as possible, and sort of distill the best
ideas and solutions, because we really want this to
be about solutions, that would be great.

So I don't want to limit the discussion
here today.  I just want to be cognizant that we
have a lot of expertise in the room and we have --
want to get through the topics. There's obviously,
in what Abhi just presented there's a lot, and it
all kinds of fits together.
I mean, I don't know how many of you saw,
you know, "A Beautiful Mind," right? It's like
arrows everywhere. So not quite that. But we want
to try to keep it sort of each conversation as
discrete as possible, even though we know that
they're all kind of linked, not only within the data
strategy itself, but across the action plan.
They all self-reinforce. So I want to just
sort of -- that is the context I think we all need
to understand, but let's try to be as efficient as
possible getting through the presentations. So
let's go up to the next set of presentations.

MR. MURRAY: So thank you, Commissioner
McAllister. So my name's Michael Murray, with Green
Technology Leadership Group, and I was asked to give
a presentation about an area I'm very passionate
about, which is, what do you actually do with all of
this energy data from meters and what is the cool
range of applications that really make energy
savings and financial savings real for customers.
And my background is as an entrepreneur
having started a company in the commercial building, energy management software area. So I've been very excited about this for quite some time. As Commissioner McAllister said, we really need to animate this market, because there's simply no way that you can get to that 5.6 percent per person, per year reduction in carbon emissions without some pretty serious changes to business as usual.

And one of the best ways that we've seen in recent times to facilitate that sort of rapid nonlinear change is with the private sector and private sector capital dramatically changing how we do business today.

So let me cover some of these interesting uses of energy data. So the first thing is that energy data is used all over the place, and it's -- that's a good thing and that's a bad thing. It's a good thing in the sense that if you get it right you can help a lot of existing markets function well.

It also means that you can enable some new markets for products and services that don't yet exist. Where it's problematic is if you don't provide energy data access in a simple way, then you add this friction to billions of dollars a year of different transactions and it really drags down
everything.

And so you know, we've all see in this community the struggles of, you know, letters of authorization to get utility data access, and wet ink signatures and faxes going to the utilities. And you know, if you add up, you know, emails and time spent on the phone and all these things to get access to usage data and to format it and to normalize it and to put it into your software system as an entrepreneur, you're probably not going to make that product widely available if it's really difficult.

So my point here is that there's great potential, but there's also significant cost that is incurred today with things like, you know, large companies trying to get budget forecasts, looking at their opex for next year, looking at, you know, the cost of goods in their products.

Doing that sort of analysis, which seems like it might be simple, can be really hard when you don't have access to energy data. It could be things like keeping your ESCOs honest. So looking at the energy savings over time for a contractor who is intended to, you know, get a share of the energy savings.
Well, wouldn't it be nice to have an easy way of really verifying how they're doing, and is -- you know -- are their payments fair for the energy savings that they've delivered? And on the small commercial and the residential side you've got applications like getting an accurate price quote for solar from someone who's not trying to sell you solar.

Having that independence and autonomy from someone making a recommendation I think would be appreciated. There's also some exciting applications with smart thermostats, and if you want to see what the load reduction is at the whole home level from a smart thermostat, well, you kind of need access to the energy usage data in order to assess that curtailment.

So when I talk about sort of advanced applications what we sort of have in mind is this notion of an app or software that can dramatically change how business is done. And you know, a simple comparison here of, you know, say an energy audit for a commercial building, which could be tens of thousands of dollars, versus an app in the app store.

And I want to acknowledge this sort of
tension that exists here, because I have a lot of friends who are both, you know, contractors and energy auditors, as well as those who write apps. And it's pretty funny because the guys who actually do audits and walk through buildings every day, they say, oh, well, you couldn't possibly have an app that replaces us, you know.

We're boots on the ground and we're actually looking at the systems. You know, I don't care how good your software is, we're irreplaceable. It's never going to be as good as what we have. And then you've got, on the other side you've got the app developers saying, that's great, but your stuff doesn't scale.

We can get to hundreds of millions of users much more quickly. You know, it doesn't matters if it's not quite right. We have the ability to scale. And so there's a lot of talking past one another. You see this with things like remote energy auditing.

You know, are the recommendations from software really accurate? And I would just ask you for the purposes of today to sort of put that issue aside. I actually don't think that matters very much in this debate.
And the reason why has to do with one of the fundamental texts of Silicon Valley, which is the *Innovator’s Dilemma*, which is a book from Clayton Christensen, and he -- you know -- this whole notion of disruptive innovation.

And he talks about disruptive innovation, and when you hear this word "disruptive," you might think, okay, well, it sounds like something big or something revolutionary, this notion of maybe unseating incumbents in an existing market.

But there's a part of, if you go back and you actually read it, we're actually missing one of the definitions of disruptive innovation, which not many people think about. And so disruptive innovation, number one, has to cost dramatically less than existing alternative, but number two, and this is the one people forget, disruptive innovation is actually less functional than the existing offering.

And that's by design. So what I'm trying to say is it's okay to have an app that's not as good as an energy audit. It does less. I really does and that's okay and that's the purpose. And the reason why this matters is that this is a -- on this graph here -- a distribution of building size,
floor space in America, with a small number of buildings exceeding, you know, one and a half million square feet, and then this so-called long tail of buildings that goes out to the right of, you know, just a couple thousand square feet.

A large percentage of these buildings, they're never, ever going to pay for an energy audit. Even if the state pays for 100 percent of the cost, they probably wouldn't even do an energy audit. So you have to reach these customers with a cheaper or free and less functional alternative, and that's okay.

If you think about the early days of Android, you know, Android was definitely inferior to IOS, at least in my opinion when that first came out five years ago. So why is it disruptive? Well, it was kind of less functional and it was free. And it was free to the phone manufacturers, right?

And so it's okay to do less. It is okay because you can get scale and you can try to address this long tail of buildings that have historically been dramatically under-served. Okay. So onto the cool stuff.

So what do you do with all this usage data? And I'm going to give you a range of commercial and
residential applications. So you know, simple line chart of your energy usage in a commercial building, you've got a gray line put on top of that, which is your predicted usage.

So prediction is really important in the software world for all sorts of reasons. Some of the application you can do here are you can predict your peak demand. That seems like a pretty important thing to do when you're on a monthly billing cycle and you pay for the high water mark during that period.

So wouldn't it be nice to have a text message alert going out to your facility managers that says, hey, today's the day; if you don't curtail we're going to be paying $10,000 extra this month. That's application number one.

We also have mandatory time of use pricing for commercial customers. So getting a sense of what your usage is going to be in those -- in the peak period from, say, 12:00 noon to 6:00 or 7:00 p.m., well, that's really important, too, because that's going to affect your budgets for next year.

You can also do something called load shape benchmarking, and you probably know this concept of benchmarking that is, you know, like Energy Star,
for example, a one to 100 rating of, you know, how does your building compare with other buildings.

Well, it turns out you can actually look at the shape of the load curve on a typical Monday or a typical Tuesday, and you can determine certain things about the operation of the building. So if that load is short and squat or if it is tall and peaky, that tells you certain things about, well, when certain mechanical systems are coming on.

It tells you, you can ask the user some questions like, when do people really come into work in the morning, and if your load is significantly ahead of the actual period of occupancy, that's a simple way of identifying waste.

So there's a lot of statistics that can be applied here to really generate useful, actionable information in a commercial building context. So you could imagine, you know, fleets of GSA folks or school district facility managers or, you know, hospitals like Kaiser Permanente and others, looking into this information, having email and text message alerts going out to folks at the right time.

So you don't have to hire, you know, another energy manager to pay attention to this. You just need to better utilize the existing people
you've hired in order to take some more responsibility for energy management.

Then if you want to look across a portfolio, wouldn't it be nice to just see which buildings need a lot of priority, which buildings need attention versus those that don't. So this is a simple chart that can look at the drift of energies to show the billings that are trending in the wrong direction.

This seems like a simple thing for executive managers and facility managers to look at every week, every month or every quarter. You sit down and you say, why is this the worst performing one and it's only getting worse and it's bright red. Anyone can understand that signal. You don't have to have an energy audit to realize that this is how you should rearrange your personnel to manage this more effectively.

Okay. Another exciting tool, moving onto the residential space. I mentioned before this notion of getting a price quote for solar that was independent or looking at your solar potential on your house, you know, without having to talk to the salesman.

Wouldn't that be nice? A lot of people are
shopping for cars that way because they don't want to have that sort of unfriendly interaction with a car salesman. So this is a tool that was released recently from the Center for Sustainable Energy. It's called the Residential Solar Rate Analyzer, and it's this cool Google maps interface. The numbers here on this sort of bull's eye looking graphic in the middle, that tells you the azimuth angle.

So that's, you know, basically, you know, how off of the, you know, north, and north and south cardinal directions is your rooftop. So you find your house here, and I encourage you to all check this out.

You find your house or your apartment or whatever and you look at the azimuth angle. You type it in and then you can use your Green Button data file from your own house, which you can get easily from your electric utility now, because you're in California, and you can upload that and it'll tell you a pretty good estimate of what the solar potential is, you know, how many kilowatt hours a year are you going to get out of a system.

That's great. That's a useful thing to bring to your -- you know -- your roof contractor.
or, you know, Solar City or someone else and says, well, here, this is what this system says; what do you think. You know, is that -- is your proposal above or below this.

So it gives a consumer some confidence and it's only possible because you know what your load profile looks like from the Green Button data. So when it comes to cost, you know, what is this, you know, what are my savings actually going to be.

It really matters. If you're, you know, if you're like me, you know, very, very small electric bill because I care about this stuff. Solar probably doesn't make a lot of economic sense for me, right? But if you have a much larger bill and, you know, the threshold for a large bill is sort of decreasing every day, but then it becomes really, really important to determining economics of solar for you.

Okay. Third really cool application, or fourth application, and this is in a residential context, is disaggregation. So statistically, with some machine learning, you can go through interval data and you can determine, you know, make guesses at things like, you know, when is the washing machine on.
Is there an electric water heater? Is there some sort of pool pump? And being able to do this is incredibly powerful. There seems to be companies that start up every year promising to instrument someone's home with, you know, a dozen different electrical meters to get this information.

Well, if you -- you could just do this all in the Cloud with a bunch of smart engineers and never have to pay for any of that hardware again. So you -- this could, for example, lead to an itemized utility bill. Wouldn't that be nice?

How many people have you talked to that say, well, you know, my bill's about, you know, $75 a month. I really have no idea, you know, maybe it's this and maybe it's this. Who knows? You throw up your hands and you don't think about it again.

Well, this would tell you, you know, your appliances, based on how much they're on, about how much it's costing you per month for that particular appliance. You could couple that with available rebates.

Imagine if you want to a Home Depot and, you know, provided some information about your electric usage history and it said, you know what,
you're in Home Depot and you've got this problem and
we have a special today on new water heaters. What
do you think? Great, great application.

Another one with air-conditioning. So what
percent of AC is -- what percentage of total use is
AC? Great way to determine that, especially with
rising temperatures. You know, folks in the Central
Valley, very important application. And some sort
of ranking on the bottom, you know, are you in the
red zone on the right; are you in the green zone on
the left.

Very simple, you know, is this person who
downloads an app going to do an energy audit of
their home? Well, maybe, maybe not. It's possible,
but the threshold for downloading an app on your
phone is a hell of a lot lower than getting a
contractor, finding some sort of rebate -- seeing if
the utility will pay for it. All that stuff takes
time.

Another application, residential or
commercial, is this notion of energy competitions.
Wouldn't it be fun to compete against your neighbors
and see who can save by the greatest amount? This
one happens to be a school district in San Diego.

Over a three-week period they saved about
$7,700. That's equivalent to about $800 per school. The winning school, as you can see here, saved about 19 percent on their electricity usage. The kids were going home telling their parents, you know, why aren't we conserving at home; why don't we have, you know, LED lights installed and so forth. So there's definitely some bleed over effect.

Parents loved it. The kids loved it. It's a great educational opportunity, integrating with the schools, and each school brought home 800 bucks that they would have spent on utilities otherwise. So again, you have to have the data in order to do this sort of thing.

The standings, the rankings, whether you go from second place to third place to fourth place and you're falling behind, all of that has to be updated with the energy usage data from the site. This is a chart of some of the benefits of exposing households to energy usage data.

This has been talked about for some time, but it's worth mentioning it here again. There's a relationship between the granularity and the frequency with which people are exposed to their energy usage data and the resulting energy savings. So again, in the attempt to sort of
lubricate market activation here, if you provide
more granular information at a higher frequency to
users, they're much more likely to see significant
energy savings and that can be double-digit, double-
digit percentages.

It doesn't have to be, you know, just two
or three percent, you know. I'll take two or three
percent any day of the week, but you could get to 10
or 20 or much higher numbers.

Okay. So one of my last points here is
that if you don't have a good system for accessing
usage data, then it costs you a lot of money, and it
costs the ratepayers through the efficiency programs
and the public goods charge, it costs the building
owners and it's a burden to everyone involved.

So you know, in our experience, getting an
electrical meter installed with some sort of data
acquisition box and a contractor, it takes weeks to
do this and it'll cost between three and $6,000. So
this is a cost that is -- instead of -- if you can't
access it from the utility then you're going to have
to go in and spend six grand to figure out, well,
what's my usage and should I do something about it.

Well, a free app in the app store has a
much lower threshold, right? You're more likely to
have millions of people use it, even though it might not be real time data. It might be one day delayed, but that's okay, right?

A little bit less degraded functionality is okay. That's okay as far as disruptive innovation goes. And you know, unfortunately, the ratepayers do pay for redundant meter installation, and that happens, because we're just now being able to -- just now able to get data through the Green Button system.

Okay. I'll end with this as perhaps a cautionary tale. This is a distribution of Energy Star scores from New York City. They have Local Law 84 requires benchmarking for many thousands of buildings in New York and all five boroughs, and you know, the median score here was 70.

One thing, if you go back and you read these reports in detail, one thing that really stuck out to me is that the vast majority of all of the buildings benchmarked in New York were done by consultants, not by the building owner.

To me, that says that we've failed, right. The fact that you need to have someone help you fill out a website on EnergyStar.gov, that means we've failed. We've not sufficiently done our job to make
this easy enough so that the average person can do it.

And you know, we've made a lot of progress in California, but there's still a lot of barriers here. And so you know, as we look at, you know, comparisons to other parts of the country, you know, looking at mandatory benchmarking, it's very important to look at, you know, who's doing the benchmarking, right. How difficult is it. I'm sure you can slap a fine on someone, but the point is not to get the rating. The point is to do something about it, right. The point is to have it valued in real estate. The point is to use that as a starting point.

And you know, if you have to pay thousands of dollars to a consultant just to get a score, it probably leaves a bad taste in your mouth and you're probably not going to want to deal with it. But if you can do it simply, and it's an on ramp to other services, it's not just this annoying thing you have to do for compliance, then I think we're going to have much better success.

And that's how you get the vast majority of existing buildings that have not seen an energy efficiency program that were built before Title 24
existed, and they need to get addressed through
programs like AB 758. I'll leave it there. Thank
you.

COMMISSIONER McALLISTER: Thanks a lot,
Michael. So the Agenda does have public comments
now. Maybe, Heather, what's your view on whether we
go now or we wait till just before lunch?

MS. RAITT: Well, it's -- we can go either
way, but you know, if you want to wait till just
before lunch, then we'll probably break at a more
reasonable time.

COMMISSIONER McALLISTER: I want to kind of
throw out a lot of the whizbang stuff and really get
people thinking, and we have another one coming up
here. I want to thank Michael for all of his work
on this and thinking about it, you know, and Ethan
and Matt, who's coming up, and others that are going
to present throughout the day.

But that, you know, the what you just said
at the end I think is that easy access, you know,
low friction, you know, if people have to think too
hard about it or invest too much of their time, then
we know what the marketplace is going to do with
that. It's not going to do it.

So we can just hear that over and over
again. I know that from my own personal experience, you know, out there in the world being a professional in this area. So I really -- and you know, for 1103, for example, the benchmarking program that we have. The goal is not -- it's not a job creation program for consultants, okay.

I mean, I know there are consultants to want it to be that way, and there's certainly some expertise that, you know, would be great if it could help nurture this ecosystem. But you know, we want it to be most useful for the building owner for that new building purchaser, in the case of 1103, and for that long-term building owner for -- in the case of the statewide benchmarking program, and it's got to be easy.

One of the things we've said in other parts of the action plan is that we're going to try to work with EPA to improve Energy Star so that it actually is more relevant than less. Now, we've sort of swallowed a little bit of a pill saying, we're going to standardize on this tool as, you know, other jurisdictions have done, but then, also, try to -- you know -- acknowledging that it's not perfect and that for our purposes -- well, it wasn't really designed for our purposes, per se, and we
need to kind of keep it moving in a direction that's helpful for the marketplace.

So kudos to Energy Star for getting that going. It's a great tool that we're going to have to standardize on. It's definitely good enough for that and we want to just make sure that we squeeze out some of the transaction costs.

So anyway, really appreciate the presentation. It gives us a lot to think about and to aim for. So go ahead.

MS. RAITT: Great. So we'll move onto the next segment on Data Enables Market Innovations, and we have two speakers, and then we'll take public comments before breaking for lunch.

MR. GOLDEN: Great. Thank you, Commissioner McAllister and everybody who's here. I think this is -- for those of us that live in this universe, this is all really exciting. But actually, I think is actually a very exciting time.

Like energy efficiency, this data work is, you know, it's silver buckshot, not silver bullets. But I actually think we, for the first time ever, just in the last year, have all of the buckshot in one place. We have everything that we need to actually make this stuff work.
It's all happening. None of it's perfect.
I'm going to go through a bunch of the tools that we are implementing and they work and they're all under development and we have to make them a lot better, but they actually are here and they do basically work, and that's the good news.

I'm going to go through a quick presentation. I'll give a little bit of context. I'm going to talk about a specific tool, which is an Open Source tool called the Open Energy Efficiency Meter that is within that context.

And then I think what is very exciting today is that just today there's a kind of a large coalition that put forward some really interesting use cases in the form of a pilot proposal to the PUC that's based on a lot of this work, as well.

So we're actually -- not only is the technology in place to actually start taking this data and turn it into something, but there's actually a path forward that many of us are seeing to say, how can we actually start implementing this stuff quickly, because really, there is no time to waste.

And we got to start learning from real experience and getting data on how this stuff works,
not just talking about it. So I was involved with a process that came from the Public Utilities Commission that the Energy Commission was very involved in and actually provided a lot of support and feedback, and that was about a two and a half year process.

And I mean, this is the idea the Cal Test, CalTRACK process that was referred to in that slide earlier, and was already presented. So I'm not going to go into a lot of detail, but it's really within the framework of the existing Home Upgrade Program.

It turns out, actually, we save a lot of energy, even compared to other states around the country. We actually do pretty well, but from a market standpoint the tools we're using, we're doing some over-predictions.

There's some concern and it was really a kind of constrained market that was hard for innovation to occur and hard for a kind of industry to scale upon. So we went through a process with both commissions and all for IOUs to develop a solution to that.

And the solution was something that is called CalTRACK, which is initially an up-front
testing protocol that allows software to come into
the California market, that allows some diversity
and competition, and that's now complete.

We have five software tools in the
marketplace. So contractors and industry have some
choice in the matter. And we tested those tools
against real buildings. It's kind of a vetting
process, and we also, really most importantly, got
them all speaking HPXML, which is a national data
transfer standard.

And so now, everybody's speaking the same
language in California. The second part of that
process, which we're just now undertaking, which we
all had kind of broad agreement again on this
approach, is the notion of something called
CalTRACK.

And CalTRACK is really what is now the EE
meter, which I'll be going through. And CalTRACK is
this notion that the only real way to have a playing
field where basically ideas in the form of software
in this case, but really, it's about business models
and ideas, can compete on a level playing field.

And so CalTRACK is this notion of, we're
going to track actual savings because we have all
this meter data, and we're going to use that within
the current rebate construct to calibrate tools so that they're all actually kind of on a level playing field and predicting accurately against the actual performance of those predictions on real buildings, and also, feedback to the market and feedback to contractors.

I mean, people literally don't know how they do. There's, not only do they not get incentivized to do well, but they don't know how they're doing. There's no feedback loop. And so we want to create a feedback loop so that we can calibrate predictions to actuals, and also, let contractors know how they perform.

And we do see some wide variance there. And so what that means is contractors actually delivering better savings could actually tell their customers they do that; so trying to start to create some market pressure towards the direction that we're trying to go.

And so that process, we're in kind of the flow of that process right now. And it really is about addressing, kind of, the existing Home Upgrade Program and the existing construct. The CalTRACK process has been, as many things are, there's a lot of steps in the California process.
And so some of us that were involved in that actually took that kind of core concept that we agreed to and have turned it into something called the Open Energy Efficiency Meter, which I'll describe in a moment, which is a totally open platform that basically does that analysis and provides that feedback mechanism.

But before I get to that I just want to frame out why this is all important, and this is definitely, kind of my big picture theory of where we're trying to go, which is, if you take a power plant, right, a multibillion dollar investment and infrastructure, you know, we look at that and say, how do we actually finance that sort of investment.

And the way that you do that is through something called project finance. So we're saying, all right. I'm going to put a few billion dollars into coal or a nuclear power plant and I expect that that's going to produce energy for some period of time.

I'm going to get paid for that energy and, 'lo and behold, that's the basis for putting that billion dollars in. And you know, of course, the developer has to have good credit and all of that, but you're not betting that that company has good
credit, therefore will pay it back.

You're betting on the cash flow that comes out of the money that you're investing in that nuclear plant. And so this is how we do infrastructure investments. This is how we build power plants.

Now, when you take energy efficiency, which according to many estimations is a bigger wedge than decarbonization of the electrical sector to begin with, and we can debate these numbers, but these are real numbers from California and, wow, that's a huge investment.

It's trillions of dollars, no doubt about it. Just residential in California to hit our 2020 goals is a couple hundred billion dollars. But when we think about that all of a sudden we say, all right, well, everyone should use their credit cards.

Homeowners are going to pay for this infrastructure investment and we're going to give them a bunch of rebates, coupons, and that's how we're going to finance it. And so this little proposal, and especially when I get to what we're actually talking about in terms of using this data to kind of transform the market, is about saying, we're going to move to a new paradigm where we're
going to pay for energy efficiency like it's an actual grid resource.

We're going to turn it into cash flows and we're going to finance those cash flows like we're building a power plant, not like we're sending out coupons for Bed, Bath and Beyond, trying to get people to buy bed sheets at a discount or something.

So this is actually just a screen grab from one of the views of the Open Energy Efficient Meter, and I'll kind of -- I'm going to kind of go through and explain in a little more detail. You know, fundamentally, there's two major things we're looking at.

We're analyzing, first of all, portfolios of buildings. This is kind of fake data, honestly, but we have this in actually real California data at this point, as well. And you take a portfolio of buildings, and that's really important to note, is that we're kind of washing out the counter-factual of, you know, you went on vacation and you got a hot tub.

We're doing that through portfolios and saying, you know, we're going to win some, we're going to lose some. It washes out with data. Turns out that when you actually take that view, energy
efficiency is very consistent.

We've produced really consistent yield curves. Do I know that you're going to save exactly the right amount or you? No, I don't. But I do know that if I get enough people in a bucket that they're going to perform in a very consistent way, and that's not different if I was -- you know -- if you were all applying for car loans, you know, I'm going to know four and a half percent of you are going to default.

I'm not going to know who it is. It doesn't actually matter, you know, and that's banking versus engineering, fundamentally. And so this analysis is looking at a weather adjusted baseline for that portfolio that we've created.

And really, all that XML data is what you use to kind of create groupings. And the data we looked at in California says, like, okay, home performance contractors, for example, actually produce a lot more savings than HVAC.

We're not going to make a judgment call. It's not one better than the other. But we're going to group them together. We're not going to put smokers and nonsmokers into the same insurance policy, or all the nonsmokers are going to leave,
and left to all the smokers.

So we're going to create that sub-portfolio that we call blocks. And really, what we're looking at is whether normalized growth savings, so this is reduction from an individual baseline on each building, but brought into an aggregate, which is how it can, again, wash out that some win and some lose.

And then a bunch of views into underwriting, because no matter, even if you're paying on performance, everybody's making an investment based on some prediction. That's inherent. And so how good is that prediction is really critical in how you underwrite the project.

And so as kind of we break up these views there's some other -- the data we're actually working with in these analyses is really monthly data. We are -- it's much more interesting when we get Smart Meter data, which we have now in the system because of --

COMMISSIONER McALLISTER: I'm going to invite you to talk more about that kind of data transfer and sort of how -- you know -- what clicks into place when you got a new project and it goes in the database and where the data comes from and all
MR. GOLDEN: Okay.

COMMISSIONER McALLISTER: So just at a high level, but sort of what infrastructure you have to get this integrated and in one place.

MR. GOLDEN: Those are my next slides. So we're in good shape.

(Laughter.)

COMMISSIONER McALLISTER: Perfect. I didn't even set you up, but okay.

MR. GOLDEN: So this is kind of a high level view of just the component parts. You know, again, we're not -- we are looking at net savings, okay. So in the parlance of actually in the utility world. So it'd be called gross savings.

I think it actually should be called net savings, but the results at the meter, right. And if you're thinking about power plants and you're thinking about carbon emissions, it's really about what happens at the meter that ultimately matters, and that's really the lens we're using.

So we're taking basically project data and that's, again, coming through HPXML, and HPXML 2.0 is what is in the SEED database roughly. They're kind of coming into sync. Again, all this stuff is
mostly working and it's all in the right direction. So we're bringing out project data that we standardize in. We're bringing utility data in and we are in the process of integrating with Green Button Connect and it seems to actually work. There's some interesting different ways to do that, as well.

And you know, and when you're actually running this kind of thing behind the utility meter you can also get the data directly from the utility. And if everyone's using the same calculation method starts don't matter that much, necessarily. But we do want access to the data for a variety of reasons, regardless. So we're bringing the data in using Green Button. And then we basically have a methodology for signing weather stations.

We actually, for California, went through and cleaned and then re-released. And actually, if anybody's interested, on the CalTRACK.org website we've actually cleaned all the CZ 2010 data and re-released it publicly now.

So everything is 100 percent open. So these are some of the platforms we'll go through. And then the outcome, again, is for people managing
portfolios. That will be a program view in kind of our current construct, but that also could be an aggregator in kind of a market construct.

Letting industry know how they do so folks that do a better job could actually tell their customers, for example. We want to do that in a kind of discrete way at first, because nobody knows how they do, and somebody's the worst and they don't know it in half of all contractors in the bottom 50 percent.

Demand views for resource planning and procurement, and then basically, actuarial views on the data that can lead towards project finance. And so those are kind of the different use cases. So in terms of the component pieces, we are -- actually, I was going to say we're the first official SEED plug-in, but I don't think it's actually official, but we are the first functional SEED plug-in at this point.

So we're built on top of this standard energy efficiency data platform system that we've all been kind of involved in for so many years, frankly, which -- but is off the ground, which is this open platform.

It's not a centralized system. It's a distributed system. So you can each have one and
you share -- and I there's some talk about who owns this data. You share the data and we trade for the data. If you want to get paid from a utility as a resource, you're going to have to give them some of the data.

COMMISSIONER McALLISTER: Maybe this is a good place for Abhi or Martha to chime in on sort of SEED, maybe backup and just sort of give the Commission view --

MR. GOLDEN: Sure.

COMMISSIONER McALLISTER: -- of where we are with SEED. I'm sorry to interrupt.

MR. GOLDEN: Okay.

COMMISSIONER McALLISTER: But I think that would -- this is all very relevant for us and not just for this --

MS. BROOK: It is, and --

COMMISSIONER McALLISTER: -- initiative that Matt's talking about, but more broadly.

MS. BROOK: So maybe apologies, because we have Robin coming to talk later today about the details of SEED.

COMMISSIONER McALLISTER: Okay.

MS. BROOK: So maybe for now we'll say that we're all interested in this collaboration in terms
of a standard database platform for energy, building energy performance and SEED has some opportunities there.

I think that we'll learn there's both opportunities and limitations, but let's not characterize that now. Let's let Robin explain exactly what's going on with SEED and what it's being used for and --

COMMISSIONER McALLISTER: Right. Great.

MS. BROOK: Does that make sense?

COMMISSIONER McALLISTER: Great. Yeah, thanks a lot.

MS. BROOK: Okay.

MR. GOLDEN: You didn't --

COMMISSIONER McALLISTER: So she's from NREL and has been involved in -- Robin is one of the drivers of --

MS. BROOK: LBNL, yeah.

COMMISSIONER McALLISTER: -- yeah, LBNL and ML.

MS. BROOK: Yeah.

MR. GOLDEN: And there are no panaceas and SEED is not -- kind of can be fun to talk about like it solves all the world's problems, but it do not actually quite do that. But we're also one of the --
- we're also part of the development process with SEED.

And so frankly, what's great about SEED is it's Open Source. So we took what it is and for our use cases were able to make it do what we wanted to do and we're in the process of recommitting that code back, because we're all building a system.

So for example, taking in Green Button data and time series isn't actually a functionality that SEED has inherently. We built it into SEED. We're going to be recommitting that code and that's the beauty of Open Source.

So we're able to actually extensively change it's functionality and adapt it because it's not a proprietary tool. It's not closed. So we are also working with PG&E right now on a kind of a -- one of the first integrations with Green Button Connect 2.0, again, not a panacea, but it seems to actually be fairly straightforward and functional at this point.

We're going to be getting 15-minute electrical data and this remains to be seen, but I believe they're going to be modified so we'll be also getting actually at least a verification or an access to gas, which will be coming online in hourly
increments in like September, we hope.

But hopefully, we'll be getting one
permission to get that retroactively. And so we'll be able to get these data flows. Pretty simple thing, not unlike signing into something with a -- you know -- Facebook pops a window.

Maybe you need to have your utility password and it works, and then we get a token and we can pull and get that data out of the utility into the SEED database for analysis. The calculation methodology that we're using, which really came out of this process that Bill Pennington and Rashdi (phonetic) were very involved in, and there's a large group of stakeholders, which is really what's built into the Open EE Meter.

We're actually putting through an ANSI process that just got underway, a joint process with ACCA and BPI, which if anybody knows the history there is kind of amazing, which the idea that we need -- this is really the weights and measures we're going to all be betting on in the future.

And we need a consensus process around that, and whatever modifications happen to that approach that we're taking, we'll get rebuilt into the tool. And by the way, the fundamental EE Meter
itself is actually being built. It's what's called an SDK. So we are attaching it to the SEED database and putting an interface on it, but it's actually designed in a way that anybody can use within even other applications, and that's fine. So we're under what's called and MIT license, which means you can use this.

You know, we're building this stuff, but anybody can take it, put it into an app or put it into an EM&V tool, and all of the sudden the real innovation is with -- we look at a portfolio of buildings, and I'm out, you know, retrofitting buildings and utilities buying them and the CEC is making sure they're doing the right thing and EPA is potentially tracking carbon, and you know what? We get the same answer in terms of the savings, and that's really the innovation.

MS. BROOK: Can you just clarify, my belief is that the MIT license is very lenient in that it doesn't require that you make modifications back and donate them back into the Open Source Project. Is that true?

MR. GOLDEN: I'm looking for other people to nod yes. Yes.
MS. BROOK: Okay.

MR. GOLDEN: Yes, that's absolutely true.

MS. BROOK: All right. Thanks.

MR. GOLDEN: It's a very lenient license and that's the intention, basically, is that we want innovation to built into the top of this, and that's written in Python and I don't know how many tens and tens of thousands of Python developers there are in California at this point. So another open platform.

So that's kind of what it is, and we're making a lot of headway and it's I think really exciting. Like we're actually -- it's all kind of pulling all the pieces together. Today is actually a really great day to be up here, because yesterday there was a proposal put under the California Public Utilities Commission through a third party workshop proceeding that's going on, that was put forward by NRDC in turn, but also supported by the California Energy Efficiency Industry Coalition, Efficiency First, SoCalREN, and maybe most interestingly today, is PG&E, to say how can we actually use this sort of infrastructure that we're implementing and use to really create a new paradigm in how we go after energy efficiency.

And I just want to credit all of these
groups for thinking outside the box and saying, you know, we got to take some changes. We got to be aggressive, you know, we have to actually try some new things.

And frankly, from an energy efficiency standpoint we need an offense, not a defense. You know, we need to be aggressively trying new things. And frankly, maybe not in California, but around the rest of the country politically we're having -- the defense isn't working and we're actually losing ground.

So this is an idea of how to really change the paradigm using this data, and to do it in the very near term. I mean, we're talking about 2016. We have the tools. We just need to decide, have the will to actually start doing it.

So the current programs -- the problem we have is that if you're a farmer and you tell me you're going to plant 10 acres of corn and develop how many bushels and I write you a check, you're probably not going to do it unless I'm there every week checking.

You're not going to plant. You're not going to water, especially here. No other markets work this way, and that's really the rebate. We
make an estimate, you get paid, no one has an
interest anymore to really see it through and you
actually kind of lose money seeing it through,
because the more work you do -- anything we should
think about? No?

MS. BROOK: No. That's someone not
reaching their car (inaudible).

MR. GOLDEN: Fair enough. So what we're
talking about in the name of this pilot is a Pay for
Performance pilot, and the fundamental thing we're
talking about is to say, we're going to meter energy
efficiency and I know that what we're doing is not
really a meter.

It's a calculation, but we're calling it a
meter because we want -- we're all going to agree,
this is the number we're going to use. And rather
than get paid in advance based on a rebate, we're
going to have aggregators, which are private
companies, figure out how to get to market, figure
out what are the consumer products people actually
want to buy, how to package this, how to deliver it
in a way in the stream that actually makes money for
industry, which is probably the biggest problem we
have right now, and ultimately, get paid on actual
performance at the meter, which aligns interests
with actual results, and creates the cash flow I was
talking about, turns this into project finance.

We're going to initially -- and we'll talk
about what the real proposal is here -- but we're
going to initially set a price based something like
what we currently are paying through the programs,
but fundamentally, the goal is not to do that, but
to establish markets that can enable real pricing on
the multiple attributes.

But critically, what we're doing is
aligning interests, and if you have these stable
yields I was talking about at a portfolio level, we
get really consistent outputs, and you get a price
and you marry those together. What you get is a
cash flow.

And that's project finance. And rather
than getting a rebate, what you're getting is
companies that will have these cash flows that could
either self finance or bring them into the financial
community and take those cash flows and sell them,
which is what's called securitization, and turn that
into up-front dollars that will go to the customer
and will go to the industry because we're in a very
competitive market.

And they're going to figure out how to take
that new cash flow and reduce interest rates, buy
down up-front fees, give customers up-front
incentives, maybe give them downstream incentives,
build better tools, whatever it takes, because if
they don't do it the next company's going to beat
them to the punch.

And if contractors don't like it they're
going to go somewhere else. And by the way, if the
system that they're implementing doesn't deliver
real savings, they're not going to get paid. And so
all these things have to come into balance, and it
really just aligns the incentive structure and it
really decreases kind of what the program's asked to
do.

You don't have to design business models
anymore. So the proposal, again, was submitted
today by NRDC and supported by this wide group of
folks, you know, the Utility Reform Network, the
industry folks and the utilities also on board, at
least PG&E and the other utilities are actually
quite board, too.

This is all happening relatively fast and
there's been a lack of time to socialize some of
these issues. The real plan, and there's a little
more detail of this, is that we start this in 2016.
We have a two-year period where projects completed in that two-year period get paid based on a number of -- that's my next bullet point -- but it's paid for three years on performance, on a biannual basis, based on the meter results.

And we established a value for the savings initially that is somewhere between how much we're paying in incentive per kilowatt hour and BTU saved today, and the actual, total price of the overall program.

That's a big range, by the way, but we want to be a discount from the really expensive savings that we have, but recognizing that program administrative cost is going to be something that will be picked up by industry.

And the program becomes something a little different, you know. It's -- and more really similar fundamentally to what regulators do in other contexts, which is protect the customer, establish weights and measures and regulate a marketplace, which -- and the market I'm talking about is how we actually establish this price for energy efficiency that takes into account time, location, reliability and volume. But you don't have to micro manage how it's delivered anymore.
So the goal is basically that we want to align incentives with the actual results to -- which is really critical so that you actually get paid for doing a better job. So if you actually go out, and you know, we don't have to debate what the right solution is or what the perfect energy outfit, if you deliver real savings -- and it's net of everything.

If it means you train your crews better and they install insulation better and you save more energy and that makes financial sense, you win. If it's a home energy management system that people behave better, everybody wins.

It's net of kind of individual measures. It's about results. And then critically we're focused -- I mean, I think the goal here is to create -- I think of it as like a fire hydrant that all these business models can plug into.

There's one particular area that is of significant interest, especially in this first pilot phase, which is that we have these residential PACE programs, which are absolute juggernauts. They did roughly two times the investor on utility and local government programs and project volume in terms of dollars.
We have no idea how much energy they saved and neither do they. And they were under -- they get a lot of criticisms. You know, well, you guys don't care about energy efficiency. And I know them and they all care about it, but when they wear their CEO hats or whatever, they have no reason to care about it.

They go to their board and their investors, what -- how do they explain to them why they should care about energy savings. They don't get paid that way. So the really kind of critical public policy purpose this serves, as well, is we get attribution for the utilities, which everybody loves. All of a sudden you talk about --

COMMISSIONER McALLISTER: I want to point out on that point, actually, too, that when back in the ARRA period we -- you know -- there was an initial focus on PACE and this was even before the FHFA sort of rained on everybody parade, there was a lot of concern that there was nothing like this and there was really no kind of credible and low-touch ability to evaluate projects for energy efficiency -- for energy savings, and to sort of -- and you know, there was a lot of hemming and hawing and pulling of hair about, okay, well, how do we make
sure that these investments, you know, are cash positive, cash flow positive, and you know, how do we let only in -- how do we only let in the projects that are going to really produce the deep energy savings.

So now, we have all these PACE programs that are going on, you know, and the most successful of them are the ones that are asking the least number of questions in terms of, you know, energy efficiency results, right. They're relying on the contractors population to the homeowners to say, hey, this is in my best interest, I want to finance this project. There are some energy savings that come into play along the way, that's great, but it's about home value.

It's about comfort. It's about all sorts of things that are intangible from the energy billing perspective, right? So I think -- so we have this resource that is clearly providing something that people want that has an energy component.

So the question is, how do we -- you know -- how can we -- I think we're getting close with this to having an additional -- potentially an
additional cash flow stream that helps orient the marketplace somewhat towards the social goal that we're all looking for, but then also doesn't create so many strings and barriers that it slows down the marketplace.

And so I think I'm kind of grokking what you're saying here and I'm very excited about it for that reason.

MR. GOLDEN: And that is absolutely the goal. Like I said, for the CalTRACK process we did this analysis on the actual performance, weather normalized in the -- I think it's just about a year old now, and it turns out home performance, for example, and people doing deep retrofits works and you see substantially larger energy savings. Just no one's ever measured it.

And so you know, talking with these PACE providers, we're implementing the meter right now, Noble Funding, for example, they want to know. They're nervous, actually, because they don't know, but they want to know how much they're saving.

It'll behoove them to start to look and say what contractors and what types of projects save more energy. And the reason they care is because those become more profitable to them because they
get paid.

And so then they're going to want to go through their portfolio of projects and creating sub-blocks of projects that have these characteristics and say, look, I want to incentivize home performance if that's what it is, because it produces more energy savings, and now I have a justification to do that.

And then it's up to them how they do that. They could reduce fees. They could reduce rate. It's up to them, whatever drives that demand. But it's based on what businesses do, which is try to make money. You can't really expect them to do something other than that, or you shouldn't.

Or if you do you'll find yourself rather unsuccessful. But the goal is, is kind of a little Venn Diagram. Everything goes best in a Venn Diagram. But this stuff needs to be -- we need to deliver consumer products and we need business model innovation.

That's what's driving solar, not panel prices, business model innovation. So we need packaging of energy efficiency into things people actually want to buy. And health, comfort, nice looking windows is all part of it, people don't even
have to know they're buying energy efficiency so
long as we're getting the results, frankly.

We need to deliver it in a way that makes
money. That's probably the biggest problem we have
is that we are starving our industry, absolutely
starving it. Nobody's making any money on this
stuff. No one wants to invest in this stuff because
of that.

And frankly, we can do a great job. We
know how to do it, but we can't do it on the margins
that exist currently. You just can't, and that's
why we're struggling so much, is that everyone is
cutting corners because they have to or they're
going to go out of business.

And then all of that gets held in check by
the fact that you have to deliver the results. And
so we've been on this roller coaster for 40 years in
the whole U.S. where we regulate, trying to get
great results till we -- the business model goes to
nothing.

And then we deregulate until we get a race
to the bottom and get absolutely drunk, right,
because whoever does the worst gets the most, and
you get the exact, all the good providers go out of
business, basically.
What we want to try, which we haven't been able to try until this data's here is to say we're going to deregulate the business model. This is still a regulated market. Let me -- there are no -- no regulatory loses their job if we get this all going up and to the right.

But we want to deregulate the business model, how you deliver energy efficiency but create accountability to the results, is the thing that prevents the race to the bottom. So in doing this we're going to lower program admin costs.

We don't have to figure out how to market this stuff the way we're currently doing it. We don't have to worry about the perfect energy audit, et cetera. We should dramatically -- and this is -- look, we have every ability to almost eliminate to dramatically EM&V costs.

We have a deal with some of our friends to make some changes to do that, but we have the capability to drastically change how we do EM&V and make it real time and contemporaneous and actually -

MS. BROOK: Matt, can you just talk to the need for attribution in this new paradigm?

MR. GOLDEN: So, we have some nod to the
reality of where we come from, but again, I think one of the key things that we're trying to get away from is, like, you can't, especially in this increasingly complex world, attribute savings between the Smart -- the app and the financing and, like, it's becoming just more and more ridiculous. You just can't figure. So but there is some validity in terms of like some of these concepts of, like, we don't want to pay for stuff that necessarily would have happened otherwise, but the construct that we've created with really the E in the EM&V, is really not tenable, frankly.

And so at a basic level, we know we need this huge amount of private capital, if you have to worry about some firm coming in four years later and changing your numbers in reverse, that's called uncertainty and nobody can bet on that.

So there's a basic thing that says, like, we just have to change the way we do EM&V or at least the E in EM&V, because it's mutually exclusive when it comes to private capital investment and it's uncertainty you can't put money into.

So the way that we're talking about doing that is we are saying, look, we're going to track actual savings at the meter. We want to establish
markets for pricing those savings. And so if there really is a lot of low hanging fruit we're going to see a lot of supply coming into the market, which will actually reduce prices.

This is not going to be in the two-year pilot, but this is where we're going to use the data from the two-year pilot to allow markets to establish pricing. And so markets will actually counteract some of the issues of like overpayment, because again, more supply will decrease prices.

And there is a proposal that is not in a bullet because it's a little nuanced, but we want to run a study contemporaneously that looks at overall societal norms and says, look, code, everything's baked into, really, energy use intensity.

And we'll discount future procurement cycles based on this discount rate of this overall societal change that's occurring, but it'll be open book. It'll be quantitative. Everyone will have the data at the same time and it'll be forward looking, and it become -- EM&V -- so it stops being an uncertainty in a million dollar report and turns into just another priceable risk in the marketplace. If you don't want to take it. You can get an insurance policy. Someone else will, and that
becomes the thing that actually puts pressure on the whole system and actually drives the cost down over time. A lot of work to be done.

Like, there's a lot of smart people in the room. Like, they still have plenty to do. If you're going to have these markets that are established that handle time, location, reliability, thinking differently what EM&V is, that's our new job, in my opinion, rather than trying to debate the merits of a certain type of energy audit or an app versus a whatever. Let's let the market figure that out, basically.

COMMISSIONER McALLISTER: So let's keep it moving a little bit.

MR. GOLDEN: Yeah.

COMMISSIONER McALLISTER: I think that was a perfect segue, actually, to the kind of the CSI, you know, project level --

MR. GOLDEN: Project plan --

COMMISSIONER McALLISTER: -- how are we going to -- yeah, great.

MR. GOLDEN: So the last slide I think just is, this is kind of a summation in terms of this.

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: This is some real data that we
looked at that I asked PG&E and they said go ahead. This is some of the PG&E houses, gas houses, basically, that we had data cleaned. So we have some realizationary [sic] problems, but my point is, if you try to bet on any individual asset, you're in trouble.

You know, you go to a homeowner and say, you're going to save money. Well, that's kind of baloney, frankly. We don't know that, even if we know it on average. But when you take another cut, and this is kind of the difference between uncertainty and risk, between on individual, you know, bullet points on this, that's uncertainty.

You take and you look at it, all of a sudden you take that and you convert it and you look at it in the form of standard deviation and this is where it becomes risk. Look at how nice that curve is. It's very, very reliable.

If I get enough of these projects I get this really smooth curve, and that's a really broad curve. And so I want to start segmenting it and I want to reduce that variance in these curves, but it's very reliable.

And the fact that it gets these reliable yields makes it something you can bank on. And even
when we look at it through the lens of contractors
with no feedback, nobody even knows how they're
doing, we're already seeing that it's a pretty
stable asset.

You know, the little red dots, the average,
these are real contractors. The gray line is
confidence interval. Statistically, that means
they're all kind of the same-ish. And this was with
no feedback mechanism whatsoever.

And so my point is just that energy
efficiency the way we've been thinking about it is
this really uncertain proposition, but you start
looking at it through this lens of data and thinking
about it as a commodity and through a portfolio lens
and it becomes very manageable and starts to look
just like other commodities, but frankly, more
stable.

So I'm very excited. Thank you for this
and I think that we are really at an important
moment where we can take a huge step forward. So
thank you.

COMMISSIONER McALLISTER: Thanks a lot,
Matt.

MS. BROOK: Thank you, Matt.

MS. RAITT: Thank you. Our next speaker is
Chris Burmester.

MS. BROOK: Do you want to introduce this topic at all, Andrew, about why we're inviting Chris?

COMMISSIONER McALLISTER: Yeah. So I guess I think probably so. You know, I have some long-term ownership of this topic, as some of you may know. But you know, the last part of Matt's presentation provided a nice segue into this.

You know, the contract -- by contractor breakdown and kind of some of what you can do with some of this information from actual projects, and how you can slice and dice it to aggregate or not, or you know, aggregate in different ways across different metrics to come up with relevant information for different parts of the marketplace, you know.

And if you're a customer you might like to know, well, gosh, you know, what contractor's most active in my area. What's their average cost per watt for solar. What's their average, you know, in the energy efficiency.

Are they doing HVAC, windows and what's their average project size or whatever, you know. How does their projected savings match up to their
actual savings for that contractor. If it's way off
then I may want to go somewhere else.

So and then on the other hand, you know, if
you're a VC firm or an investor of some sort and you
want to either buy a portfolio of projects in the
financial markets or if you want to invest in a
contractor on the ground.

For example, that information is priceless
in terms of -- or it's just not priceless. It's got
a price and that's kind of the point. So providing
that intel to the marketplace, to enable the people
looking at this from different -- you know, and none
of us is the total expert on this.

And so we need to fertilize the broader
marketplace with the right kinds of information so
innovation can happen, you know. It's not simply
Energy Commission. It's not the utilities. It's
not anybody in particular, other than smart people
with an interest in this topic.

So that's the kind of broad goal here, and
I don't want to take up too much of Chris's time,
but Chris has been involved. So back in the day
when this solar initiative was starting, you know, I
was one of the administrators of it, as were PG&E
and Southern California Edison, and we worked with a
number of smart people to bring the online tool, you
know, with leadership at the PUC, to bring this
online application tool and database into existence.

And then it just we saw it in very real
terms over time get better, okay. It opened up.
You know, we opened the kimono on this stuff. The
data was not good to start and it had a lot of
issues, and people, you know, threw tomatoes at it.

But over time it got better and it became
really market driving. And now, I think it's seen
as a resource. It's been a real success story. I
think, you know, the sort of vision of the PUC to
geret this thing going, and then you know, combining,
you know, working in the other programs, including
the NSHP, into that resource has really provided
market intel that the Federal Government looks at,
that individual states look at, that lots --
globally, actually, it's used to kind of track the
evolution of the marketplace, not just in price, but
in equipment and types of systems and any number of
metrics.

So it's been a really good resource. And
the idea here, just to be perfectly open, is look,
this is an example of project level, detailed
information that has been made public, but in an
anonymized form.

So it is very specific. You can go drill into a ZIP Code and look at project after project after project at that ZIP Code. You don't know what the address was or who was it, but you do know the contractor and all the information about that project.

You don't know pre-post energy consumption, because that's not necessarily so relevant for solar, because it's much more predictable. Energy efficiency is more complex. It's different, but I think in the data environment that we are today in 2015 the idea is to have a discussion about what a public facing resource that includes much more information than we practically have available now might look like.

And so I think I'm not a data guy. So I don't -- in terms of really, really getting it deep deep down, but I kind of know that there are many people who will help the State of California if they have access to the right kinds of information, and I want to have that conversation relevant to energy efficiency, and Chris is going to tee it up and sort of give us some of the history on the solar initiative.
Sorry if I duplicated a couple of your bullets, but I'm sure you have much more to say, so thanks for being here.

MR. BURMESTER: Thanks a lot, Commissioner, for that really germane introduction. We had the pleasure of working on this together, I think and going through some of the trench activity of actually getting this up and running.

And it's really exciting to hear the previous talks today, and I would like to also really double down on some of the themes that we've heard and hopefully, we'll see that. We'll see that. I think Mike said earlier that keeping it simple and focusing on doing what you can do now, and not over thinking it, getting it out into the wild.

You know, software and data analysis is very agile and iterative. You know, when we have things in the Cloud we don't have to get it right the first time. We can get it mostly right and fix it, and I think the CSI Public Reporting System was a good example of that.

The value of getting it out and getting out that sort of crowd sourced input is very, very important. And then I also agree with the other
speaker that real time data I believe will massively change our approach to EM&V.

I think we saw this actually in California Solar Initiative. We didn't set up to make the public reporting site essentially make the EM&V problem go away. But what's interesting is that we had this very large, you know, EM&V budget, which is now being repurposed because it's underspent to do more public reporting.

And I think that's largely, you know, just talking anecdotally to regulators and such, it's because of the confidence that we have in this public data set that CSI has reported. Nobody questions this data. So the question is, how do we get to that really valuable outcome that makes the evaluation of this program so clear and transparent.

I'm Chris Burmester. I'm a vice president at Energy Solutions and we're an integrated, demand side management, design implementation firm. We've been working in California and nationwide the last 20 years.

It's a real pleasure to speak here today about this program. And I love talking about public reporting, because public reporting is something that I think everybody thinks they understanding.
Like it -- oh, yeah, public reporting. We just report things in the public.

But it's actually a belyingly simple -- it seems simple on the surface, but there's a lot of very important principles that we want to do, to do it right and well and to take advantage of the full impact of what we can do in public reporting, and hopefully, I'll hit on some of those things today.

So what I want to talk about today a little bit is like, what is the impacts of public reporting. What are the outcomes? What is the California Solar Statistics Public Reporting website? How did it come to be?

And you know, what are the lesson learned and key success factors, that if we want to do this with other data sets, with energy efficiency data, with demand response, distributed energy resource data, what are some key lessons that we can apply to those as we move forward in this area.

So -- oops. Wrong slide. I'm going to start with, I love this slide because I think it encapsulates a lot of outcomes. In the gray we're seeing numbers of interconnected PV projects, and this is actually from a recent -- the early results of a new effort where the Commission recently
authorized that Interconnect Data start gathering
the same kinds of data that CSI has been gathering.
The green bar is the number of CSI projects
that have received incentives over the years. And
you can see initially that those two numbers track
very closely. But in recent years you're seeing the
number of CSI incentive projects, whereas, the
number of interconnected projects is growing
exponentially.
And this is a clear example in the data of
market transformation, you know, which is the theme
of this particular part of the day today. So the
number of actual projects that are receiving
incentives that are out there is dropping
dramatically.
So clearly, there's been an impact in --
there's been market transformation in California.
And you know, the question is how did this project
drive market transformation and how did the data
help that.
And I think most people that are involved
agree that the transparency that this data provided
in terms of pricing, in terms of the systems
installed, where they're installed, what vendors
were being done, had a large impact in driving this
industry forward.

And what's interesting, and when we first proposed to release some of this data, there was a lot of concern that the vendors and the industry would actually object to this and would do this over protest. But over time, this became such a valuable resource for them, for them to make data driven business decision, that they actually -- there was a public workshop about four years after we started releasing this data where an industry spokesperson got up and said, the most valuable thing that came out of this CSI program is the CSI public reporting data, and what are we going to do to make sure that this data continues to be gathered in the State of California?

So that was a real victory for this. I think initially this was motivated from a regulatory standpoint, but we had hoped that would have this sort of market transformational aspect and it certainly did.

So moving on, for those of you who perhaps aren't familiar with CSI reporting, what it involves, I just have a few quick slides here to go over what the features are. So California's Solar Statistics website features a complete California
Solar Initiative Project public data set.

And as Commissioner McAllister said, we went through all the data and we produced a somewhat anonymized data set, but it was actually real project information, real prices, location by ZIP Code, and this data set we make available through the California Solar Statistics.

It's provided in terms of weekly data updates, and this is key. There's frequent data updates, and this is a key principle in data reporting which I'll talk about later. It has interactive charts and reports right out of the gate.

These are automatically generated, interactive charts and reports, and there's lot of downloadable data sets. We have what we call the filter data set, the work -- filter data sets are essentially what you're seeing in any slice or any report that you're seeing.

The working data set is actual, the data set out of which any bad data has been culled. The raw data set is actually the full, complete data set, including any data that is -- has deemed to be, you know, not -- it has some errors in it. So you have the complete data set.
And then there's the archival data set. This is the data set where you can access any complete set of data from any week of the program from January 2009, when we first started reporting this, to the current date.

We also have information on contract resourcing. So this is where you can search to see what projects have been done in various areas. So if you're looking for a contractor for a project, if you're a host customer, prospective customer, you can find and search for projects in a variety of ways on the site, and this enables research.

And then we also track metrics and budgets for the program. In terms of the standard reports, there's about 12 standard reports, each one of them has some standard features that enable public reporting. So we have interactive figures and charts that let users quickly understand the program metrics and data.

Every chart has a record count of the data that's going into it, and the ability to download the data that's being displayed in this chart. Now, this is a really key feature because it lets others do their own analysis.

And actually, in the simplest way, we had
people who -- newspapers or media outlets who wanted
to include this data in their own articles and
reports, and this lets it put that into their own
reporting features and display it in the ways that
they want to.

So it promotes more of a public discourse
around this data. Every chart has standard display
options that let you -- let the user select
different data types, time scales and other high
level attributes associated with the program, and
every chart has standard data filters that allow you
to narrow and refine your queries and to visualize
differences across multiple program components.

And in a number of charts we often let two
sets of filter data be compared one against each
other. So the values of these very interactive
reports is you don't just get the data. You
actually get the data in a way that you can
immediately engage with and manipulate and answer
questions you might have about the program.

And for a lot of people this site is
sufficient to answer their questions. In fact, one
of the motivating factors was initially approached
by Molly Sterkel, who was the Energy Division
Manager on this project from the beginning, and she
was being inundated by requests from the Legislature, from regulators for reports all the time, also from media and others, and she was just, I need this. I need some self service reporting just to reduce the costs associated with tracking this program.

And so that was an early success. We just took all the reports that we were providing on an annual basis and made them accessible on a weekly basis, and all of that, all those reports went away. So that was early success.

Finally, we have lots of fine print. We want to be very, very clear and transparent about where this data is sourced, what it means, what are the different terms that are being used. So there's lots of supporting detail. So you don't have to wonder what the data means.

So that's what CSI is. What are some of the success factors and what are some of the lessons we learned in actually doing this? So a key success factor is that a rigorous data integrity process insures data quality and allows for automated public reporting.

No one's checking these reports. They're being generated automatically, and data integrity is
key, and that means we have extensive validation on every single import and we're filtering out data that is deemed to be erroneous for fixing later on. And I'll talk a little bit more about how that process works.

Frequent updates and feedback loops provides insight into market drivers and continuously enhances our data quality. So every update is a chance for us to improve the data, to find problems, to push it out to the public, to get feedback and to make that data better, and that was a key factor.

Downloadable data, very important to provide unfettered access. We're not limiting access to this data. We want that feedback, and that does essentially enable this crowd sourced quality assurance. And as Commissioner McAllister said, in the early days it was a little rough. We had a lot of people pointing out a lot of data integrity issues with the data, but because we were updating this weekly, we very, very quickly drove to a very clean data set, identified our problems and moved forward.

You know, it's interesting. A lot of people think that just having a database -- and we
did have a statewide database right from the beginning of this project -- and you think that just having a database is sufficient to have good quality data, but that's not necessarily true.

If you don't check it, if you don't, you know, analyze it and if you don't review it, if you don't provide access to it, you're not sure that that data is good, and that was very clear in this program, as well.

So data visualizations give policymakers and stakeholders of all sorts the tools necessary to look and examine real program performance. And then this user friendly interface grants the public the ability to view the data multi-dimensionally and answer the questions that they have very freely.

So what are some outcomes from all of this? Well, having an iterative data integrity look yields high quality data and that's really keen. The data availability transparency and the quality that we get creates a trusted data set.

And as I mentioned before, having a trusted, unquestioned data set leads to the ability to assess the outcomes of the program very transparently, and in real time. EM&V costs are minimized by the availability of this trusted data
And more importantly, in situ program modifications are enabled by having a current, quality data set about how the program is trending. And we saw this on numerous occasions with CSI, not the least of which was recognizing that there was an error in the program such that we were under budget by I think, what was it, $200 million or -- yeah, it was a lot.

And the real time reporting actually was able to project that the PBI calculations were off and we were able to correct that.

Reduced administrative costs through automation, standardization and self serve reporting. And probably the most important is that all stakeholders, the policymakers, the investors, the solar industry the customers are able to make data driven decisions.

And finally, the cumulative impact is to yield more reliable and actually larger program impacts. So a little bit about data integrity and automated validation. So this would seem to be obvious, but you'd be surprised at how many systems do not do this.

What you want to do is have multi levels of
validation on every field, and data just is simply not accepted in a system unless it passes validations. So we have a field level validation. We have multi field validation.

So if a field has this value, then another field must have that value. We have record values. If we have one project of one type, then we must have a project of another type where we can't have another project of another type, and then we can have program logic validations. You cannot have data of a certain type based upon the program qualifications and requirements.

And then total data set validations. If we're getting a file, just for example, that just doesn't match the specifications, we're not going to accept it, as well. So the program administrators for this program initially provided us raw program data.

We have sets of, you know, thousands of validations that are being performed on these in real time, and every week we produce a data integrity report. From that data integrity report we create an internal feedback with the data administrators where they're -- will take the data that's good, but any data that's flagged as being
failing validation for whatever reason is reported back to the program administrators, and they are expected to fix that in the next week's export. A lot of times it's just missing data.

And then, finally, we have a public feedback loop from external stakeholders where they're doing their own analysis. They reported to the program administrators and that data is fed back into correcting the data and also new validations, as well.

So when we set this up we knew that this data was going to support diverse needs. And one of the key factors was making sure that we had out of the box reports and the data that would enable all the different stakeholders.

So for example, policymakers, we wanted the data to inform timely program refinements. For customers and vendors the data facilitates a competitive market, both between vendors and also for customers in choosing vendors.

One of the things that we were surprised about because the leasing model sort of originated during this program was that this data was going to be so important to investors and Wall Street. And in fact, outside of California the biggest hits we
get from this website are from Wall Street.

And then, you know, academia and the research industry, this data has been the source of many, many reports and analyses about the solar industry. And as I said, this data is widely used, not only across the nation, but worldwide.

COMMISSIONER McALLISTER: I want to kind of interject here, too, because I mean, one of the things we talk about, you know, in the action plan and I think it's got a long history here with mixed success, I think at best, is the valuation problem.

You know, how can we assist in the having energy efficiency characteristics of a home or business, you know, impact the real estate market, right? So you know, we have some statutory obligations to create tools there, but we also want to make them work as much as possible.

Well, in solar they're -- you know -- on the research side, you know, LBNL and UC Berkeley have done quite a bit of research on when you have solar on a home what is the impact on its home, on its value.

And they now have enough reliable data, both from the building markets, and the real estate markets, and the solar industry based on this data
that it does -- there is a statistical impact and it can be quantified.

And so then it can be built into transactions. How do we do that on the efficiency side is kind of part of our broader question here.

So I want to just remind people of that.

MR. BURMESTER: All right. So just a couple slides to think a little bit about, based upon what we've learned from CSI public reporting, some of the features that we want to do. What are some near-term opportunities for expanding this type of public reporting to the IDSM arena?

And by that I mean efficiency, demand response, you know, all distributive energy resources, and of course, the topic of today's Workshop, Energy Efficiency in Existing Buildings.

The first thing we need to do is capture the data we already have.

I mean, this is, again, simple things that we can do now. And you know, my sense is that this is all publicly funded projects and data. We should get this data being captured. We need to standardize the data scheme in a format. This is a big part of this.

Obviously, the CSI data set is essentially
one subset example, and the efficiency problem is much more complicated, but it's not intractable.

It's very doable. I think those of us who do this kind of work know that this is possible.

It's just a matter of rolling up your sleeves and getting into that data, and again, creating some of these frequent updates of data, and establishing these feedback channels, because right now this data is what I would essentially call dark matter.

It's not really super available. I know, through my work, I know that the utilities are starting to work internally with tools that mix up demand data and project data in ways that are incredibly simple, but also, incredibly powerful in terms of prospecting for efficiency.

And we want to support common use cases. We want to support the common use cases, as we saw earlier in this presentation, about the different stakeholders. You know, what does the vendor community need?

What are the host customer needs? What are the utility needs? What are the regulator needs, and make sure that we're thinking through that and providing data reporting that immediately addresses
those needs, and also reporting that data, as well.

In terms of some of the more future things, and we've heard some people talk about it today, we want to integrate, you know, detailed project data and report those for buildings. We want to be able to support the creation, the prefab creation of building models.

We're seeing companies like First Fuel and Retroficiency go out, and using publicly available data sets, build models for the building energy use, and in a way that the building order doesn't have to start from scratch.

They can basically go on, a model already exists and they can start tweaking it. And they, oh, no, no, you know, you thought I had, you know, fluorescent lights; we in fact have, you know, a different kind of lights in the system and you tweak them all a little bit and you get zeroed in.

We want to be able to bring in lots of different data sets and we're seeing this in the private sector, as well. I think we want to be able to support this, is bring in the public data sets, but also bring in lots of different data sets in terms of the data that's available from real estate, the data that's available from, say, the Google
Earth type data set, also from benchmarking, from the projects that are being funded through the energy efficiency portfolios, all these things.

We want to be able to bring all these things together. And obviously, I know a lot of people are talking about this as part of the energy efficiency in (indiscernible) buildings, integration with energy data center data and climate and marketplace indicators.

And I think a lot of us are struggling with the privacy concerns around energy data, but it seems to me that even something so simple as classifying buildings into energy intensity and providing a gradation that, you know, you're not giving the actual use, but you're giving them essentially a rank or an interval, even that would be useful to know that this building has this sort of energy intensity or this sort of peak demand. You don't have to give away the detail data, but even with that data we can do a lot.

And I just want to end with the decision, this recent decision from November of last year that was essentially authorizing the interconnection process to gather CSI data. And I think this is really great.
It recognizes that we don't just have a single purpose here. Publishing this data serves multiple goals for multiple people. It supports host customers. It supports academic researchers and journalists. It supports utilities. It supports the entire marketplace in accelerating the transformation around these technologies. So open and transparent reporting should be a part of every initiative, and I'm excited that it is a part of this bill. So thank you very much, and that's --

COMMISSIONER McALLISTER: All right. Let's give everybody who has participated a hand, including Chris.

(Appause.)

MS. BROOK: We want to take a few questions, or?

COMMISSIONER McALLISTER: Yeah, let's take a few questions. I'm going to let -- we've made everybody sit in the hot seat, sit in their seats and bite their tongue for all morning, but I think we can all agree that that was a really, really great slate of presentations, and I want to thank everybody for being here.

Also, I want to point out just -- but we'll
meet more of staff, as well. So let's -- I think I
want to just make sure that everybody knows that
hopefully, our panelists will be around for the
whole day and you can talk to them directly.
    But also, our staff is available to provide
feedback, get orientation on what kinds of topics
might be most -- if you have limited time -- direct
comments, most helpful to us, because we want to
develop the record in this direction and try to get
some idea of where we're best going to go with this.
    So with that I'll just open up for
questions, and Heather can manage that on the web
and on the phone, as well. So do we have any blue
cards at all? I think we're --

    MS. RAITT: Not that I'm aware of.

    COMMISSIONER McALLISTER: I think we're
going to be a little free form here. If people want
to comment on what we've seen this morning, then
you're welcome to do so.

    MS. RAITT: All right. Is there anyone in
the room that wanted to make comments? If you could
just go to the center podium, identify yourself and
we'll have the timer going.

    MR. NESBITT: George Nesbitt, HERS rater.
I want to just hit a couple things, access. On the
residential end it's been fairly good, I think, even when you had to fill out a form, although you didn't get as much data that you can online.

Quality, I mean, quality is important. Garbage in and garbage out. Compatibility, we definitely need a lot more compatibility, because often, we recreate models in different software. And every time you recreate the real wheel you have room for error.

So I'm happy to see greater compatibility being worked on. Privacy, I think privacy is -- I think sadly been an excuse to hide failure and success. If you're not disclosing names and addresses, I don't really see where there's a privacy issue.

Too much data can be a problem, as much as a problem as no data. And back on the access, we have a lot of databases, whether it's New Solar Home Partnership, California Advance Home, CSI, but a lot of that data is not available, and then it may or may not be used.

I want to hit on sort of Matt Golden's presentation. On the one hand, I think we all agree, what we ultimately need is real savings. Yet, I think there's a lot of data, and as you point
out, even though there's uncertainty looking at an individual house, and individual results, on average we're getting savings and we're doing pretty good, and that it's really not -- despite that uncertainty, it's actually -- there's good stuff there we can use with.

So there's always this, like, talk of going to performance space. But here's the -- you know -- so if you want to go with the results at the meter, here's the problem. I have really low use. So what you're saying is I should go home, turn on all my lights.

I should buy a freezer to add to my two refrigerators, despite my low use, crank up the heat, increase my energy use so I'm incentivized to save real energy at the meter, and that's where, you know, ratings and predicted savings have an inequity thing, because if you're looking at -- when you're looking at real results, going back to quality, what happens if my customer adds -- just decides they just saved a bunch of energy.

They go out and buy that electric hot tub, so they increased -- even though they save, they increase energy. So it doesn't look like we saved as much. And then the other big issue is PV and
that metering.

Wow. It looks like we did really good.

Well, how much of that was actually efficiency and how much of it was because they added solar. And so you know, this is where it's really critical in going back to things like quality, knowing what's done.

And the one other comment I want to make is, I think a lot of these tools to streamline things are great, but even with commercial clients, they often don't know or don't understand what's in their building and their systems, and even with professional staff.

And so at some point it comes down, if they want to move, once they want to decide, actually getting someone out there with boots on the ground.

COMMISSIONER McALLISTER: Thanks.

MR. CORMANY: Hello. It's Charlie Cormany, from Efficiency First. I want to support the idea of measured performance systems, a major reward for major performance that Matt had described earlier.

One of the things missing in this industry as a contractor is feedback on the performance of your jobs. There's a lot of assumptions that are made. There is trainings that we've gone through.
There's mentors that we've subscribed to their theories and practice in the industry. But unless you were able to do actual data logging of your own job, you had no real feedback mechanism to measure this. In my own company we were using Green Button data. We were actually getting permission from people to monitor their electrical use.

COMMISSIONER McALLISTER: Um-hum.

MR. CORMANY: And we have -- did before and afters, and it was valid tool and we could refer to it later after the post-retrofits. So basically, expanding on that concept and making it available, I think should really be supported and it's a great effort.

I think PG&E deserves a lot of accolades for their efforts in that direction with CalTEST and CalTRACK. I think they have the potential to change the industry and I'd like to support those. I think when we start making data driven decisions we can make business models that revolve around success and not around predictions and deemed results. I think that's really critical.

And I just think the pay performance will lead to business models that have a clear-cut way
for a contractor to differentiate themselves in the
marketplace and say that we can provide -- we can
charge this because we're providing that.

That's something that is sorely lacking.
There's very little for comparisons. So in general,
I think that this is the first time we've seen a new
approach or anything within the industry. The data
has always been the missing link.

I think we have effective means to get
there. I think EE meters are the right step and we
should embrace this technology and move in that
direction.

COMMISSIONER McALLISTER: Okay. Thanks very much. I have a question, actually, for you and
the panelists. So you know, one, so there's
obviously a very relevant conversation about sort of
the program environment, and you know, both at the
POUs and the IOUs and sort of, well, how ratepayer
funds are being used to incentivize efficiency and
how we create accountability, as we must and, you
know, should be accountable for.

So that's kind of the program nexus that I
think this can help function and streamline and
reduce friction of. But I guess more broadly I
think our task is actually a lot greater than just
making incentive programs functions.

It's activating the marketplace and, you know, whether or not a project, a given project, receives an incentive from ratepayers, we want that project to take place and we want it to be as efficient as possible and we want it to be in the customer's best interest or the consumer's best interest.

So in that, if we look broadly at the landscape, you know, we have windows and doors guys, you know. We have -- the contractor community has many upstanding citizens who do fantastic work and who are completely trustworthy and delivering on their promises and treating customers in an excellent way.

If we activate the marketplace and scale it 10 or 20 fold, let's say, as you know, basically eight to 10 fold we think is the minimum to get to where we need to be in terms of scale. So we're going to have some new actors here.

We've seen, you know, 30 years ago we had the solar water heating programs that you could argue, you know, weren't all that well designed. I think you don't have to argue that. I think it's fact.
But I guess my question is, how do you see these kinds of tools helping to create -- playing a consumer protection role and not just sort of getting -- you know -- I think Michael said, you know, we don't want to sick salespeople on everybody.

But so the flip side of that is how do we make sure that the offerings people do get are from credible, not over-promising contractors?

MR. CORMANY: And you know, I think that's actually pretty easy to speak to. In today's environment, I can say from being a former contractor, negative comments from social media that are out there are so detrimental to your business as far as search engine optimization and other things that contractors, once they get into a marketplace like an eBay scenario where you have a star performance rating or a percentage rating, I think those external factors and those people who are watching the markets, the Angie's List of the world, those kind of things are really, really important to making sure.

And I think the market will take care of itself in that regard. You're not going to have to monitor because I know from my own situation, we
were very concerned about YELP and all the rating
systems, and those in and of themselves become the
driver for doing performance, because one bad rating
in those environments can be so detrimental to your
existence that it will raise the bar and self
police, is my take on that situation.

COMMISSIONER McALLISTER: So you don't even
think this tool needs to necessarily be tilted
towards providing that consumer protection or it
sort of will be automatically or what?

MR. CORMANY: I think by default of having
the information available it will serve that
purpose.

COMMISSIONER McALLISTER: Okay. Thanks.

Anybody else have any comments on that?

MR. GOLDEN: Yeah, I do, actually, just
kind of building on those comments. I think
actually the solar PV market is a good place to look
for some inspiration on this front. I mean, if you
look at these -- to the solar providers like the
Clean Power Finances and Sungevities and the Sunruns
of the world, they're exposed to performance risk,
and so that alignment of interest, they're actually
-- if these projects don't perform, if those -- you
know -- if someone does a project that the local
contractor screws up, they have contingent liability on that for their brand and everything else. And we're actually seeing, you know, the biggest supplier of quality assurance in the solar market are the solar finance companies, not programs, and there's hundreds and hundreds of these inspections going on, and it's really turning into a function of the rating agencies.

And if you want to get capital you have to manage your performance risk and you have to keep your customers happy.

COMMISSIONER McALLISTER: So in that sense these tools would actually play a fundamental role in helping develop that sort of quality assurance.

MR. GOLDEN: Yeah. The performance of these projects no longer --

COMMISSIONER McALLISTER: Microscope.

MR. GOLDEN: Yeah -- it's no longer just the customer --

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: -- that's taking the risk.

It's the marketplace.

COMMISSIONER McALLISTER: Yeah. Great.

Thanks. Go ahead.

MR. KNOX: I'm Bill Knox and I'm just
speaking as a residential customer, essentially, today. But I think that the issue of privacy sometimes gets a little overblown. I think it's really important for especially residential customers to have control over the privacy, or not, of their data.

And you know, on the one hand, you know, we get contacted by solar marketers probably three or four times a year, and probably a couple times a year by performance contractors. And actually, I think in general that's a pretty good thing for me as an energy wonk anyways.

But I do think that if I was able to say just, you know, make my own data public about my energy consumption, in some ways it would actually reduce the number of contacts because I already use so little energy that solar's not terribly cost effective.

And also, you know, if I had already participated in say the performance contracting stuff or the Energy Upgrade California, which I haven't yet, but I think then people would know not to contact me, which could be another benefit for me.

So and I would also just finally point out
that, you know, mostly I get, you know, many, many
times a year I get asked how much I want to restrict
information from companies that have information on
me. And I think in the case of my utility
information I don't recall getting that from PG&E.

But you know, those forms that I get
saying, you know, what can we do with your private
information, if there was a way that I got a request
from PG&E, can we share this for this reason, that
reason or that reason, then it would be nice to be
able to say, yes, you can share it with, say, solar
installers, but not performance -- or vice versa.

And that way, I could sort of make my data
available as -- you know -- I could also say it's
available for research, even by address and phone
number.

COMMISSIONER McALLISTER: That's a really
interesting point. So basically, you're saying an
opt out instead of an opt in, right?

MR. KNOX: Yeah, well, it kind of -- it
should be in my --

COMMISSIONER McALLISTER: Sharing.

MR. KNOX: -- since it's my data.

COMMISSIONER McALLISTER: Yeah, absolutely.

MR. KNOX: I should be able to opt in or
out for a variety of --

COMMISSIONER McALLISTER: Yeah. Or you should at least be asked, you know, whether you want to sort of play, you know.

MR. KNOX: Yeah. I mean, don't just assume that I want it all private.

COMMISSIONER McALLISTER: Um-hum.

MR. KNOX: Especially if I have choices about for which purposes it might be used.

COMMISSIONER McALLISTER: Yeah. I mean, that's actually an interesting question about, you know, if we make the right sort of public service pitch, you know, maybe a significant minority of people would actually -- maybe a majority -- if we think optimistically -- would actually opt in.

MR. GOLDEN: They actually have -- Matt Giller I worked with in -- they did some analysis for (indiscernible) Chicago and they just asked -- it was a very unscientific study -- by they asked about 90 people, I think, to share their data and about 40 did.

Now, as a performance contractor I find that, like, if people have any level of trust, we think this is really confidential information, but consumers don't tend to have that same opinion about
their energy bills and are much more free with it.

COMMISSIONER McALLISTER: Yeah. It's not
the same as their credit card number, right.

MR. KNOX: Medical, yeah, lot of --

COMMISSIONER McALLISTER: So yeah, or
medical history or whatever, yeah, so.

MR. BURMESTER: Yeah, I just want to agree
with that. I mean, if you look at, as more of the
private sector moves into energy, the energy
industry, as well, like with the NIST thermostat and
other providers who provided residential products
that gather information about them, people routinely
grant access to this data for a variety of uses.

And I think we can see in the private
marketplace customers being very comfortable, you
know, or far more comfortable than we're assuming
about providing data. And especially, as you were
saying, if you make the pitch for this is a public
service, or this is beneficial for you, you know,
exposing the benefits of sharing this information, I
think we would find that there'd be statistically
significant subset, at least, of data available to
companies to do analysis and ROI on a variety of
energy strategies.

COMMISSIONER McALLISTER: Yeah. Yeah. I
mean, and I think, you know, the law of large
two\numbers would show that the percentage of
participants doesn't have to be that big, as long as
it's diverse enough and dispersed enough, right, to
really get some good information about the building
sector and habits and behavior.

MR. BURMESTER: And if we're thoughtful
about how we stage this, again, the use cases and
case studies of how people have benefit, how the
society benefits, how the sectors have benefitted
from this kind of analysis would support further
comfort with people disclosing their life.

COMMISSIONER McALLISTER: Yeah. So I think
this is a line I'd like, if people have some
expertise or some thoughts on it, I really like if
people could put some views of that in their
comments, because I think this is something
worthwhile to move forward with in terms of
empathizing the public benefit.

You know, everybody acknowledges that, you
know, privacy is what it is and customer control of
data is what it is, but there is a public benefit
that I think is going under -- sort of under-
represented throughout this whole discussion, that
you know, I think as we move through this long-term
project of reducing our carbon footprint statewide
we're going to have to figure out ways to empathize
and to get people to buy in. Michael, yeah.

MR. MURRAY: Just a quick point. It's
worth noting that I think that the privacy and the
use of the data can -- they don't always have to be
opposed to one another.

COMMISSIONER McALLISTER: Yeah.

MR. MURRAY: How a lot of companies these
days operate that use your energy usage, they do
what's called scraping where you give that company
your login and password to your utilities website,
and they just have carte blanc access to do whatever
they want.

And the reason why they do that is because
it's easier than going through the front door and
filling out the forms and so on. And so it's kind
of a gray area, you know, if you technically reads
the terms and conditions of access, you know, that
utilities only want the customer and only the
customer to access their website.

And so I think by actually bringing that
system that's currently in kind of a gray area into
you know Green Button Connect, where you have, you
know, companies that are registered and there's a
very clear list of who has the authority, you know, for how long to access this usage data, I think you could actually better align, you know, customers' expectations about their privacy with outcomes.

So because once you give your username and password to someone else who knows what they might do with that.

COMMISSIONER McALLISTER: What they'll do.

MR. MURRAY: Right.

COMMISSIONER McALLISTER: I'd be interested to hear the utilities later on, whether they know, you know, what their sense of how common this is and are they -- what are they doing about that, if anything. Matt, did you want to say something or -- yeah. Okay. Great. Go ahead.

MS. LITTLE: Hi. I am Debra Little. I'm a valuation and home performance consultant. Heard a lot of discussion today in relation to residential data about that that we can get from Smart Meters and utility bills, all about the utility bills.

I just wanted to bring up or ask about the interest that folks have on granular data on the actual home performance measures installed. If we had a way to collect that and share that in a really fast, mobile app that contractors can use in like
five minutes, that could also produce reports that
are valuable to homeowners and home performance
contractors and the whole real estate segment,
agents, appraisers and lenders, would anyone find
that useful?

COMMISSIONER McALLISTER: That's a great
question. Maybe I want to -- I think all three of
our panels could talk to this, but in particular, I
think, Chris, you started the suggestion. You know,
you can drill down into it, that you know, we need
some analog to the CSI that would be -- you know --
that is related to energy efficiency and other
demand side stuff, but that it would be more complex
and would require some thought, but it's doable.

And maybe I think at least in part, that's
what you're asking, is like if you had a -- you know
-- project-wise, you know, it wouldn't just be they
got solar. It would be they got HVAC and windows
and whatever else.

MS. LITTLE: Right.

MS. BROOK: I think it also relates back to
what Ethan was mentioning in terms of the historical
energy audit information.

COMMISSIONER McALLISTER: Right. Yeah.

MS. BROOK: So I think it's related to
that, also, like what has happened in these buildings, you know, specifically, but go ahead, Debra.

COMMISSIONER McALLISTER: Oh, yeah. I mean, I guess I would be interested -- that's exactly kind of -- that's sort of the big question we're trying to answer, is that what would a resource like that -- it's one big question we're trying to answer, what would that look like.

And so how would we go about putting that together and what the -- you know -- eventually, like, what would the fields of that database actually have to look like.

MR. BURMESTER: Yeah. I think most of us in the industry, I think at any level, recognize the value of having this data be more accessible. I mean, obviously, there's a lot of discussion that needs to go on about the privacy concerns of that data and how you get access to it.

But for example, right now we have Green Button Connect and customers can authorize vendors to get that data. There's really no database right now that would allow a vendor to get access to everything that's been done at that facility in the past.
And theoretically, that data is out there, but I think most of us who have worked with this data know that it's in a lot of very disparate data sets and there's a tremendous amount of work to be done, but it can be done.

I mean, that's not an undoable problem. I mean, bigger problems are being solved all the time. So just assembling that data set would be useful, and it's in a variety of containers throughout the state in other resources.

So that could be done independently of having the privacy conversation, because the value of having that data would be huge, I think. On the privacy front, you know, I think most of us -- I want to just surface one issue, which is -- and I think I've spoken to others about this -- the collective data set in terms of customer data and all these measure data represent a huge what I'll call prospecting resource.

If you think about it, it's like all of this data is like having the GEO exploration seismic data for the entire State of California from energy efficiency as a resource. And if we're looking for where we're going to harvest energy efficiency in the future, there -- you know -- we'd like to get
access to that data set to do analytics on that, because with that we can zero in on, you know, the cost effective resources that are out there.

And customers may not even know that there's a huge benefit to them that could be done and a huge benefit to the state by doing a project that is clearly in the data that we could do. Of course, there's privacy concerns with getting access to that data set.

But you know, some simple things is providing access to the full data set, but anonymous, and once you've identified a facility or a customer who might benefit from a project, the utility themselves could decide to make the introduction.

Or there could be some other process by brokering that introduction, and so you keep the anonymity in place. You know, you let the vendor community or the public research community access this data set in anonymous fashion, and once they say, oh, here's a whole series of prospects, they own that analysis, you know. So that's one way we could go.

COMMISSIONER McALLISTER: That's interesting. Sort of the analogy -- I mean, I think
Commissioner Doulgas would be very interested in that analogy between say the DRECP analysis, you know, as a sort of a resource that could be exploited, you know, sort of across the state and where's the best places for it, the most cost effective places.

You know, they did a tremendous amount of geo reference data, layer after layer of natural resource and habitat, et cetera, et cetera, maybe you know, sort of the, you know, okay, there's this many fracking places and there's this many energy efficiency places and let's do some compare or contrast, all right, so.

MR. BURMESTER: Just a quick follow-on. I mean, there's a lot of concern with, you know, San Onofre going out and the once through cooling plants, that there are some grid -- you know -- there's some capacity constraint areas, and being able to do essentially exploration for efficiency and peak demand shedding, unleashing that, not just amongst the utility commissions, but amongst the private sector to go after those resources.

And I think, you know, you were speaking about energy efficiency as a resource. I know that the CPC is looking at this and Edison has their
Preferred Resource Pilot. I know the vendor community's very interested in getting behind this, but again, providing access to the data in some form that respects privacy --

COMMISSIONER McALLISTER: Yeah.

MR. BURMESTER: -- it should be a key issue that we'd look at.

COMMISSIONER McALLISTER: All right.

Thanks. Matt, and then we're going to have to finish up with the questions. We got a few more people in line here.

MR. GOLDEN: I'll keep this brief, but I think we do need -- I think there's a question of are we talking about individual data.

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: And there's some also question about how, because of the counterfactual problem and the diversity it needs, how much value you get out of individuals' data --

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: -- versus aggregated, anonymized. And that's one of the use cases we're kind of building into the meters, the ability to very easily open your data set in -- through the lens of the PUC ruling, aggregated and anonymized.
And that's actually where a lot of the value lives, is to be able to look at that data set and extract how do these measures perform in aggregate. But I would also highlight that it's a trade, right. You know, we have companies investing in figuring out how to do this stuff.

So if we want to take that data and make it public there needs to be a trade of value somewhere in there.

COMMISSIONER McALLISTER: Um-hum.

MR. GOLDEN: Fundamentally with the folks that actually own that data and are investing in delivering it, basically.

COMMISSIONER McALLISTER: Yeah. I mean, I would love to hear people's comments on that. I mean, I see it as sort of, you know, the truly public data would be some subset of the overall available, and then there would be value added in some way by private actors that could --

MR. GOLDEN: Depends where you get the --

COMMISSIONER McALLISTER: -- that could --

MR. GOLDEN: -- the project level data, the auditing data, that's the data that like --

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: -- we need to trade for,
basically, and exchange for something that it becomes public.

COMMISSIONER McALLISTER: Yes. So I agree that's a valuable conversation. Matt, thanks for coming in. Appreciate it.

MR. HARGROVE: Hello. Thanks for having this Workshop. Matthew Hargrove, with the California Business Properties Association. I represent a number of different commercial real estate groups, including Boehm (phonetic) of California and (indiscernible) of California, ICSC and a number of others.

Most of our members are very active, large real estate companies and are bought into a lot of what we're talking about here today. A lot of them are already doing it in-house, internally, and we find data very helpful.

I think a lot of companies aren't going to view what the Energy Commission is doing here with data as in any way a threat or cumbersome or anything like that. However, as the Commission moves forward we just, you know, we want to caution that as we look on the commercial real estate side of things, it's a lot more complicated than the residential side of things.
And it's even much more complicated than we think. Most of our conversations here today, as they veer into commercial, really is focused on owner occupied, and owner occupied is not the majority of properties out there that this type of program really needs to get at and we know that.

So it seems a lot of the conversation on the very complicated data issues are really talking towards your very large real estate companies that are somewhat familiar with this and already doing this.

How do we translate that over to where we know we really need to get, and those properties that we really didn't even talk about today, those very small properties. A lot of this stuff in downtown Sacramento, that's what this program was really written to go after.

And I'm not hearing linkages in the plan or in the lot of the discussion today of how we crack that nut, to use the cliché. We as an industry have been saying for years, you know, you can regulate new buildings out of existence and you're not really going to do anything to greenhouse gases.

We really need to get at those pre-Title 24 buildings that aren't currently doing the types of
things we're talking about, and really aren't going
to do a lot of this data techniques that we're
talking about unless somebody gets in there, buys
that building, completely refurbishes it and then
already has a preexisting relationship with somebody
in-house, has an energy firm they're working with
and the like.

So that's what we want to help figure out,
is how we get at those types of buildings and most
of those folks aren't going to be members of my
association.

COMMISSIONER McALLISTER: Right.

MR. HARGROVE: So how do we get there?

Even with the large commercial real estate
companies, we want to make sure that there is
sensitivity, and I do know that there is over the
last few years of coming here and 1103.

COMMISSIONER McALLISTER: Yeah.

MR. HARGROVE: That the multi-tenanted
buildings are -- that we take care to figure out how
to work through those issues. Especially in the
beginning of 1103, the easy answer was to let's
ignore the complications of business contracts that
are out there with leased spaces in buildings, and
put the onus on the folks who own the properties and
the owners of the buildings to report this information, even though we all knew that it was putting a third party into an awkward position between a tenant and the utility that they had. We were able to work through those issues with 1103 and --

COMMISSIONER McALLISTER: Almost.

MR. HARGROVE: Well, I mean, we're there, but again, today in this discussion with a lot of this what we're hearing from a lot of your folks that are presenting today is there's -- we're not hearing a connection between how 1103 is working, how that data is provided.

COMMISSIONER McALLISTER: Right.

MR. HARGROVE: And that contractual -- how that got fixed and how that actually gets applied to this use of data over here. Again, you know, it was acknowledged that there's some legal issues that we need to work through. And our message as an industry is help us help you work through some of that and --

COMMISSIONER McALLISTER: I appreciate --

oh, go ahead. I'm sorry.

MR. HARGROVE: Well, and finally, because I seem him blinking, I want to bring up just a big
political thing that I think is baked into the current, the initial plan that was released that I just -- I want to caution the Commission from sending mixed signals on some of this today, on all this data discussions that we've been hearing. My folks, we're hearing all the right things. Your data's going to be protected. It's going to be aggregated. You know, we're going to do this in a way that folks aren't going to come after you. But in the plan you have baked into the initial release of the plan public disclosure of building performance. And we think that that's sending mixed signals to folks out there.

On the one hand you're telling us, this data's great and we're going to use it to allow you to get your buildings to become more efficient. On the other hand, we're going to provide information so you can be publicly shamed up and down the state, on Facebook and on YELP and everywhere else.

And that type of things makes folks a little bit nervous, saying, I'm hearing two different things coming out of this plan. And as somebody who shows up to all these workshops, I get that they're two different things and they're two different strategies.
But as that unfolds out there with folks in the industry who maybe don't read my newsletters closely, that tends to send a little bit of a mixed signal and causes some worry that, well, what do they want all of our data for over here; is it just to spank us over here.

COMMISSIONER McALLISTER: Yeah. So I really appreciate the point, and you know, I think there is both a private benefit and a potential public value to those two things. You know, we've taken care in the plan to say, look, what we're really first and foremost concerned about is the benchmarking itself.

And then at some iteration down -- you know -- the second down the road, and we need to define what that looks like in a conversation, there is a proposed disclosure, not necessarily the energy consumption, possibly, but you know, monthly, annual, something, but the benchmarking score, for example.

And I think the purpose behind that is to provide some standardized viewpoint of the building stock to the world. And the idea isn't to shame. The idea is to say, hey, you know, provide some, you know, appreciation of the diversity of the stock,
and yes, to focus in -- you know, I'm a glass half full guy -- focus in a positive way on the buildings that need the most resources and the work to be done, and create, kind of align all of the planets so that that can happen, not, you know, negatively to shame.

But in any case, this is more of a -- I think where we've maybe left out some pieces in the conversation today is linking up the benchmarking. You know, we did mention SEED and BEDES and that kind of thing, well, 1103 and the new benchmarking program would kind of pass data into a database that would allow us to understanding the building stock more and create better policies that get to these very issues of making sure that assistance and help gets to the right buildings where the savings are.

MR. HARGROVE: Yeah. And again, we appreciate that, and in terms of the public disclosure, the feedback I'm getting, and you know, I know Martha' heard this for five years through 1103, is the folks are making decisions about energy efficiency. That information's being provided to, through 1103.

Putting up a red bear in my lobby isn't providing the information to anyone who can actually
make any decisions.

MS. BROOK: Red bear.

(Laughter.)

MR. HARGROVE: But what it is doing is making my property more difficult to bring in tenants who can then help me bring in the cash I need to put the building through a complete energy efficient retrofit.

And I mean, you know we're having this discussion with the new code setter out there, that the disconnect between existing buildings and these extremely efficient new codes we have, we feel that disconnect is just drifting these further and further away, and it's making it harder and harder to take older buildings --

COMMISSIONER McALLISTER: Yeah.

MR. HARGROVE: -- and bring them up to new code, and that just kind of feeds into all of this.

COMMISSIONER McALLISTER: I feel like we -- so these are tough problems, but I feel like we've really keyed these up reasonably well in the plan. I mean, you know, the two code problem, you know, we're not saying exactly here's how we need to solve that problem, but we need to talk about it.

We also need to make code more relevant for
existing buildings and I think we've really -- I
mean, you know, we've identified that problem at our
Commission and we've said, we're going to try to
solve that problem.

And I think that's the kind of open the
kimono approach we're kind of trying to take here,
because that's the -- we have to be collaborative
and team-based to get this stuff done, so.

MS. BROOK: Yeah. That's --

MR. HARGROVE: And I started all this by
saying, we are very much in support of what you're
doing. We recognize that. I think we're 98 percent
with you right now on all of this.

COMMISSIONER McALLISTER: Okay. I really
appreciate it, yeah.

MS. BROOK: Yeah.

MR. HARGROVE: And appreciate the fact that
we can come and have this type of discussion with
the staff.

COMMISSIONER McALLISTER: Absolutely. The

MS. BROOK: Great. Thanks. And I'm going
to limit my comments, because I could go on forever
with you, Matt, but it's already 1:15 and my
stomach's growling.
COMMISSIONER McALLISTER: Yeah, mine is
growling, too. Amy is going to bring up the caboose
for lunch. Yeah, that's great. Thank you very
much.

MS. REARDON: Right.

COMMISSIONER McALLISTER: Thank you very
much.

MS. REARDON: Thank you, Commissioner
McAllister.

COMMISSIONER McALLISTER: Thanks for being
here, Amy, from the PUC.

MS. REARDON: Absolutely. My name is Amy
Reardon. I'm with the California PUC. My
colleague, Chris Villareal, will speak after lunch
in greater detail about what the Commission has done
in terms of data access, very important data access
developments recently.

But and I'm really here in listen mode and
to be supportive of my colleagues. However, I would
be remiss if I did not point out my background, of
course, I grew up in the CSI Program and I am very
much aware of all the wonderful things that
happened, and how exciting all those days were and
what a whirlwind it was, especially when it became
truly a market transformation program.
Well, you know, you move around, you get promoted, and so I was given a job as the Energy Efficiency Data Management and Reporting Lead. And so my first order of business was to create a website called -- well, we basically ripped it off from the California Solar Statistics, and it's called California Energy Efficiency Statistics.

You can Google it during lunch. It's EEstats.CA -- no -- .cpuc.ca.gov. To the extent possible, given the differences between the kind of data available for solar versus the kind of data available for the mind boggling array of data available for energy efficiency and the kind of data basis that we curate, to the extent possible I have made a one-to-one match with the California Solar Statistics site and EE stats.

Okay. With all the caveats, millions of them, but I'm going to stop there. We do want feedback. You know, it's in beta mode right now and we're still working out some of the bugs. But you know, we -- there's a site feedback button and I think you guys, you know, know that, you know, we're only putting more and more resources into this as time goes by.

But a lot of things, I think somebody
mentioned where can I get measure level detail. I'd be happy to show you. We have a heat map that shows measures at the ZIP Code level, actual measures. We have a wonderful plethora of data that is currently, you know, for public consumption. Thank you.

COMMISSIONER McALLISTER: Thanks for being here. All right.

MS. RAITT: Actually, we do have a few people on WebEx.

COMMISSIONER McALLISTER: Oh, we do, okay.

MS. RAITT: Yeah.

COMMISSIONER McALLISTER: Okay. Who?

MS. RAITT: So --

COMMISSIONER McALLISTER: We're all --

their stomachs are probably rumbling, too, so.

MS. RAITT: Absolutely.

COMMISSIONER McALLISTER: Or maybe they're in their kitchens. Who knows.

MS. RAITT: We'll open up the lines one at a time. But right now, Chick Bornheim, if you're there, will go ahead and make your comments.

MR. BORNHEIM: Can you hear me?

MS. RAITT: Yes. Thank you.

MR. BORNHEIM: Okay. Good. So I think, you know, we're in the data business and a lot of
this stuff looks great. We're in the commercial
side of things.

COMMISSIONER McALLISTER: Could you
identify yourself?

MR. BORNHEIM: And looking forward to --

COMMISSIONER McALLISTER: Could you
identify yourself, please?

MR. BORNHEIM: This is Chick Bornheim.

COMMISSIONER McALLISTER: Great. Thanks.

From what company?

MR. BORNHEIM: Oh, Light Pro Software.

COMMISSIONER McALLISTER: Great. Thanks.

MR. BORNHEIM: We're also an electrical
contractor, little company called Power Down Energy
Services. And what we're seeing with Title 24 is a
lot of chaos. And so I'm wondering, I mean, just
looking at this as a pre -- Title 24 as a precursor,
you've got lots of resistance to compliance.

You've got building inspectors telling
cOMPANIES they don't need to comply. All they have
to do is write a letter saying they did comply and
they don't need to follow the rules, get the
inspections, et cetera.

It seems pretty chaotic out there. How are
you going to, I guess, get people that don't want to
conform to these, I guess, standards that are evolving to do it? What kind of money do you have to enforce any of this stuff if people don't want to spend the money?

COMMISSIONER McALLISTER: Let's see. So this is not exactly the topic of the day, but I guess --

MS. BROOK: He says, like, how do we get people to comply with the standards? Is that the question?

COMMISSIONER McALLISTER: I mean, that's really up to --

MS. BROOK: Sorry. I listened to the EE stats --

MR. BORNHEIM: To participate --

COMMISSIONER McALLISTER: I think.

MR. BORNHEIM: Participate.

COMMISSIONER McALLISTER: Well, there's really two points here that I would make and then, you know, Martha or another staff can chime in. I mean, that's the still a responsibility of the local Building Department to enforce the code.

We at the state level don't actually have enforcement authority in the Title 24 realm in terms of being able to levy fines and all that sort of
thing, as we do in the appliance realm. So you
know, it is a compliance that is law, but you know,
obviously we know that it can be spotty.
I mean, in some areas there's actually
over-compliance, but in any areas there's not,
particularly residential.

MR. BORNHEIM: Right.

COMMISSIONER McALLISTER: But so I think,
you know, you've identified a great problem and I
think we, you know, would love to hear sort of your
pragmatic boots on the ground kind of view of how we
could make it work better and be more streamlined.
But you know, fact is, we do have aggressive codes.
That's part of our policies.

MS. BROOK: Yeah. And so we do have
specific strategies in this action plan to target
code advancements, improvements, streamlining for
existing buildings. So we're not tackling the whole
code domain, but certainly are interested in -- you
know -- there's definitely some market failures
there and we want to try to remedy those.

And one of the market failures about
people, you know, completing an upgrade and not
meeting the code requirements, we definitely take
that to heart and we want to do everything possible
to improve that situation in the marketplace.

The interesting part to me is that there's another market failure and that's basically that people see the costs of an upgrade to be so onerous that they don't -- they actually defer upgrades. So we sort of expect in the program world that people are changing out their equipment every, you know, five, 10, 12 years, but in actuality, there's 50 to 100-year boilers that are too expensive to replace.

So those are the kind of additional market failures that we do think are very important to achieving our goals in existing buildings, and we're working with the PUC staff to target figuring out ways that we can improve those market situations.

COMMISSIONER McALLISTER: Great. Thanks. Next call.

MS. RAITT: Steve Uhler. Are you there, Steve?

MR. UHLER: Hello.

MS. RAITT: Hi. Go ahead.

COMMISSIONER McALLISTER: Okay.

MR. UHLER: Can you -- hi. I'm Steve Uhler. I'm a residential energy user. My comments are related to Michael Murray's presentation, the
many uses of energy data. I agree that the energy savings increases with granularity and frequency of feedback.

He had a slide in his docketed version called, "Data Access Method to Home Area Network Activation." I'd like to hear more about that and whether or not more systems can be used with Smart Meters.

Right now, I'm with SMUD and they have one device that's actually no longer made, and it's only for loan. I'd like to have one all the time. I'd like to have one that used a hub or something so I could hook it into other things.

I believe that the real time energy use information needs to be easily available, as available as a clock hanging on the wall, and is reliable and low cost. I find some metering costs to be lower than Michael Murray's 2900 to 6400.

I use a low cost sub-meter energy monitor and it costs about 120 bucks. They're easy to install. My energy use monitor allows me to easily know where to find savings. I'm joining real time information with information on energy sources and appliance efficiency.

I use some CalISO data, energy appliance
data and made up a couple sites, wwmpd.com. That's
What Would Mr. Peabody Do, dot com, and ugemrp.com,
and I find knowing when green energy is in season
through the day, that would be the Mr. Peabody site,
uses CalISO information and allows me to see when
the energy's the greenest.

That site you might have to check to see
whether or not you have an up-to-date browser. My
understanding is the Energy Commission browsers are
not able to look at it. But a phone or tablet will
work.

And then I also made up a version of the
Appliance Database to allow me to find appliances to
help me reduce greenhouse gases. These are some of
the arrows in my quiver that I use to improve my
energy use.

Data centers can be virtual data centers
that as long as they give data dictionaries and
indexes to the data. Not being bound by new data
standards is an advantage; easy access to raw,
unaltered data in whatever interchange format,
except for spreadsheets and PDF, through an index of
data sets would be nice. Thanks.

COMMISSIONER McALLISTER: Thanks for your
comments.
MS. RAITT: Okay. Last one is Michael Nguyen.

MR. NGUYEN: Hello. This is Michael Nguyen, from the SoCalREN. My question is to all the panelists and also the Commissioner, with all the discussion today on AMI and near real time data that potentially enable programs to deliver and measure actual impacts.

So I would like to hear your thoughts on Ms. energy efficiency program design with a baseline based on actual conditions versus a cold baseline.

COMMISSIONER McALLISTER: I'm going to defer to the panel on that one. Go ahead.

MR. GOLDEN: I think that this is a critical point. There's a fundamental, existential problem with energy goals driven by incentives that are above code, while we're driving code to zero energy in the same time frame, and I think there's some sort of dilemma there that seems kind of insurmountable if we don't start addressing this issue.

But you know, I think we have to start just treating energy savings from a baseline as a resource and say, look, if we reduce consumption for whatever reason, whether it's a retrofit or,
frankly, code or anything else that drives up
behavior, we're not building power plants. We're
not emitting carbon.

And again, some of the issues that we're
trying to protect against around all of these
ratepayer protections is we've historically fixed
the price. So if you start getting lots of savings
it would have happened anyways. It costs more.

But if we start to move towards markets
that establish pricing based on supply and demand,
that stops being such an issue. So, you know, and
then we need to mention that -- Mr. McAllister --
that there isn't exactly 100 percent code compliance
anyways at this point.

So somehow, we have to kind of move past
this paradigm, and I think code baseline is one of
the first things we have to get over.

MR. UHLER: This is Michael. My sense is
that as the goals of, you know, by 2050, as those
get closer and closer we should -- we need to really
think hard about uncertainty of, you know, what --
are the energy savings real.

And you can ask the same thing of a
performance based structure like Matt had proposed,
but you can also ask the same about the widget
programs, too, you know. How many hours do those --
did those CFLs really get used per year, you know?
What's the actual measure life?
   And we can argue about that until the cows
come home. And if you're going to argue about
something anyway, why not just make it about, you
know, performance. So I guess what I'm saying is,
our risk tolerance should increase as the scope of
the problem increases.
   And if -- you know -- yes, there might be
some, you know, vacancies in buildings that lead to
some sort of subsidy, right? Their energy use went
down because their occupancy rate dropped. Well, I
think we're just going to have to accept some of
that.
   And that's not to say that, you know, we
don't accept some of that today, right? I mean, we
have --

COMMISSIONER McALLISTER: Yeah. Yeah.

MR. UHLER: There are uncertainties with
how we do things today, and there will be
uncertainties with how we provide public subsidies
for efficiency in the future. Let's just have an
honest -- you know -- let's just face that honestly.

COMMISSIONER McALLISTER: So you're saying
that utility efficiency goals would have to go up.

MR. UHLER: No. Well, yes and no. I mean, there are issues of commingling widget programs and a performance-based program on the same home or the same commercial building, definitely.

COMMISSIONER McALLISTER: Right, for sure.

MR. UHLER: But yeah, I mean, there are uncertainties. You know, I mean, as we've said before, you know, mild weather is not an energy conservation measure. Well, you know, what about vacancies?

What about a four-person household that goes down to a two-person household, you know? I think we should just accept that there might be some of that, that happens, and --

COMMISSIONER McALLISTER: In reverse, right.

MR. UHLER: -- it can be managed and -- yeah, or the reverse, and you can take a portfolio approach and you do the best that you can and that's, you know, that's okay. And it just pains me to see, you know, so much resource going into EM&V to calculate to 10 decimal places, you know, the useful, you know, measure life and these other numbers, and the reality is, there's false precision
there, as well.

COMMISSIONER McALLISTER: Yeah.

MR. GOLDEN: I think where an issue, it's -- we're roughly accurate or precisely wrong on some of these situations. The one thing to consider, as well, is we start to think about EM&V not as like a backwards looking knob that we're turning, but as a procurement, you know.

The utilities are faced with keeping the lights on. As they start to look at energy efficiency as a resource, frankly, if there's a bunch of stuff that they're counting in their baseline that they expect to be there, like free ridership and code, that means they have to -- and so if they're procuring savings and they expect some percentage of that's already in their calculation, they have to procure more of it.

I mean, that's how markets work fundamentally. And then it's a solar work. I mean, think about it.

COMMISSIONER McALLISTER: Yeah, exactly.

Yeah, that was my point.

MR. GOLDEN: Yeah, exactly.

COMMISSIONER McALLISTER: Yeah. All right.

We have anybody else on the line?
MS. RAITT: Well, we'll just open it briefly to anyone on the phone. So if you are on the phone and don't want to make comments, please mute your line now. So okay. Sounds like they --

COMMISSIONER McALLISTER: Okay. I want to just thank everybody. I'm sorry for running over. I just, sometimes I can't help myself and I think all of us are interested in the conversation. I don't know if I'm responsible for the whole thing, but maybe just for not being the task master.

But I'm going to cut lunch to 45 minutes. So 2:15 I think is the best time for us to get back, and hopefully, we can get back on track and not go too far over the end of the day. Great. We'll see you at 2:15. Thanks.

(Recess at 1:31 p.m., until 2:21 p.m.)

COMMISSIONER McALLISTER: So pass it off to Heather.

MS. RAITT: Great. Thanks for coming back to our workshop, and so we'll jump right into -- we're going to hear an overview of CPC's May 2014 data decision from Chris Villarreal.

COMMISSIONER McALLISTER: Okay. Thanks for being here.

MR. VILLAREAL: All right. Okay. Thank
you, Commissioner McAllister, and everyone with the
CEC for inviting me to participate in today's
Workshop. I'm Chris Villareal. I'm a Senior
Regulatory Analyst at the California PUC, and I work
in our Policy and Planning Division.
And I'm going to just give a -- hopefully,
a not terribly lengthy overview of what we issued
last May 2014. To provide a bit of context, this
slide provides you with the information about the
three major privacy decisions that the Commission
has issued over the last almost four years now.
The one thing I want to point out about
these decisions is that while they are ostensibly
about privacy, they are also about data access. And
the reason why I point that out is because, as we
heard earlier today, in my opinion, privacy and data
access are viewed as things that don't work
together.
You either have privacy or you have data
access. You don't have the two working together. I
began to think about this, having worked on some
cyber security stuff. When you think about cyber
security you want cyber security built into the
process, and not bolted on later.
And I'm viewing privacy sort of the same
way, is that I just talk about data access. If you
build privacy into it up front you don't have to
deal with it later on. You don't have to deal with
the headaches going on afterwards.

You can have the rules on access and
privacy together so everyone knows what I going on
up front. And then as you continue to move forward,
then you can start modifying the rules as you see
fit through technology advancements.

Maybe things no longer have a privacy risk
anymore, but it allows everyone to know what the
rules of the road are for privacy and access, so
that those two can work together to, then, further
the goals of data access.

The Commission is very supportive of
getting data out there to become used and useful.
After all, the utilities, we did authorize the
utilities to spend upwards of $10 billion to invest
in AMI just on the residential side.

And having the data that's been generated
from the AMI to become used and useful in the
market, to the utility and to the customers, will do
nothing more than get greater savings out of that
investment.

Just quickly, our privacy rules are based
on the Fair Information Practice Principles. They're just a basic set of rules that -- or principles that have been adopted at both the Federal Trade Commission, as well as in Camden (phonetic), by the Office of Privacy Council in Ontario.

The rules as I described them generally apply to the utilities, utility contractors and the third parties that obtain data from utilities. They May decision modified that slightly, but generally when we're talking about our rules, those are who we are applying to.

The rules were mostly a consensus of the parties themselves in our proceedings. That includes utilities. That includes consumer advocates. That includes privacy advocates, and that includes third party participants.

One of the things that I always found interesting, especially after reading Ethan's paper, is that it's Berkeley is sponsoring his paper. Our rules were developed by two different schools inside Berkeley, the School of Information and the Samuelson Law Clinic.

So we have two arms of Berkeley that helped write our rules, and then you have another arm of
Berkeley sort of taking issue with them. So I enjoy the irony of it. As I noted earlier, the goals of the rules are to protect privacy, but also enable customers to give the information or share their information with a third party of their choice.

We had a discussion earlier with Chairman Weisenmiller about ownership. Ownership was actually a very big discussion in the context of our proceeding in the development of our 2011 rules. And all the parties, again, all the parties in the proceeding agree that ownership acted more as a red herring, and that the more important question was access.

So earlier in the day I think it was explained accurately that customers have the right to access their information and they also have the right to share their information. Beyond that, ownership confers a whole series of legal arguments that the Commission at that point then decided not to get into around ownership rights.

In other words, what was told to us is that if the consumer is conferred with ownership rights over data that has a potential to lead into certain tangles, legal tangles that we would rather not get into over how the utility can then use the data for
other purposes, or how the Commission can use the
data or provide it to other entities. So we just
completely avoided the discussion of ownership and
decided that access is in fact the more important
aspect of these rules.

So here's a short overview of the May
decision. It is roughly 177 pages long. I invite
you all to read it, you know, before you -- if you
can't go to sleep. It does put on at least six
things.

It directs the release of usage
information, so this would be your identifiable use
information, to educational institutions for
research purposes. And the decision outlines what
we mean by an educational institution and what we
mean by research purpose.

Number two, it directs the IOUs to make
available on a public page, on their web page,
certain monthly, total monthly sum and average
electricity use and natural gas use by ZIP Code and
by customer class.

We provided, and I'll show you the long
language of what we mean by how to aggregate that,
but that allows and puts out some information about
customer usage information by customer class, by ZIP
Code, on a public page, without NDAs, without any need to go through the utility, other than to go onto their web page, and that page should be up, should be up by now.

Three, it directs the IOUs to make available to local governments yearly, quarterly and monthly usage and other usage related data by data request to the utility, provided the results meet certain aggregation standards. And I'll outline what those are later.

It reaffirms the ability of federal or state agency that has the direct statutory authority to access the information to get the information. Many of the requests in this proceeding were in conjunction with the CEC around implementing similar statutory requirements.

We again reaffirm that the other agencies are allowed to go and ask and get the data provided it meets specific statutory requirements. And then the last two things is --

COMMISSIONER McALLISTER: Chris, can I just jump in on that point four?

MR. VILLAREAL: Sure.

COMMISSIONER McALLISTER: So is that -- when you say "the data," do you mean the same kind
of data you're talking about in these other points or is that, you know, basically the state and federal have special status or what's the --

MR. VILLAREAL: Well, I wouldn't call it special status, Commissioner. If you look at the enabling statute under the Public Utilities Code it allows the PUC and other federal -- other governmental entities, predominantly state agencies or federal agencies --

COMMISSIONER McALLISTER: Yeah.

MR. VILLAREAL: -- to obtain information without customer consent. And what this does is if an agency in the purpose of implementing a statute --

COMMISSIONER McALLISTER: Okay.

MR. VILLAREAL: -- says, to do this statute you should use or must use usage information for this purpose, you don't have to go through the rigamarole that you may have done in the past. You can go and say, we are implementing statute one, two, three.

COMMISSIONER McALLISTER: Okay.

MR. VILLAREAL: It asks for this information, please let us have get it, please let us have it.
COMMISSIONER McALLISTER: Yeah. So then --

MR. VILLAREAL: And so I also understand

1103 then has the second language about how to

protect customer privacy.

COMMISSIONER McALLISTER: That's kind of

where I was going with that. But also, just you

know, the Warren Alquist Act gives the Energy

Commission, per se, also some authority in this

area.

MR. VILLAREAL: Yes.

COMMISSIONER McALLISTER: And I just wanted

to make sure that we weren't getting crosswise.

MR. VILLAREAL: No.

COMMISSIONER McALLISTER: Yeah.

MR. VILLAREAL: The decision explicitly

states that existing authority under the Warren

Alquist Act --

COMMISSIONER McALLISTER: Yeah, great.

MR. VILLAREAL: -- for the CEC is -- you

have it.

COMMISSIONER McALLISTER: Yeah. I

understand. Great.

MR. VILLAREAL: You have it. And the last

two points talk about a process to allow these

authorized entities how to do the requesting to the
utilities. One of the concerns we heard in the proceeding is many of the local governments and the universities noted there was not a similar process across the utilities.

Each utility have their own unique process for obtaining or for requesting and obtaining information. So this decision streamlines the process so all four utilities, because this does include SoCal Gas, has -- this is the same process across the four utilities.

It has the same steps along the way for all four utilities, and I'll get into this later. And then number six, creates an Energy Data Access Committee, and you heard earlier from my colleague, Amy Reardon, she has been tasked with helping to move that committee forward, and I can talk a little bit more about that.

At the proceeding itself we considered 12 use cases. Those use cases helped inform the six things that we're doing here. We did not always approve these cases, because as I pointed out earlier, we are at the beginning stages of this process.

And it's my expectation, especially through the Energy Data Access Committee, that as we
continue to move forward we will identify new use cases, new processes and modifications to the processes that we've adopted in this proceeding as we go forward to help facilitate the use of this information.

This is just a short thing on data aggregation, and this is going to be me opining for a little bit. Aggregation anonymization is a tool or two tools that can be used to lower the risk through identifying a custom.

So while we talk about usage information, think about it as ones and zeros, right. So what the data analysts want to get are the ones and zeros. And what I point out, those ones and zeros are atoms and you start putting enough ones and zeros together, or enough atoms together, you start to form a body.

You start to form an entity and then that becomes an identifiable person. And of course, under state law and the Constitution, everyone has a right to privacy. And that's where the Commission is sitting, is trying to manage our way through two arguably competing interests of data access, but also protecting customer privacy.

And so by moving forward on data
aggregation techniques and methodologies is a way that we can hopefully provide more information out for the public. But there are varying risks to the data and there are varying risks to re-identification, and I just identified four of them here.

As we think about the data, the granular data provides different risks. If we have 15-minute or hourly information that is arguably higher and it has more value -- that does have more value, but it has more risks associated with re-identification versus if you had daily, monthly or even yearly, you have lower risk of re-identification. Geography --

COMMISSIONER McALLISTER: Chris, this re-identification term, I guess, could you give us a little background on that? Is that just a priori a bad thing or is there some scenario where even though re-identification in theory might be possible, it's still okay from a privacy perspective?

MR. VILLAREAL: That's why I talk about it in the terms of risk. I won't say whether re-identification is, in and of itself, a bad thing. I think in our interpretation of the statute we wanted to minimize the risk to the customer to be re-
And understanding the risks associated with the data and how it can be used to re-identify a customer, at least in the way we've developed our methodologies, can help lower or mitigate the risk to the customer of being re-identified.

If you wanted to avoid re-identification risk entirely you would not make any of this data available, and that is not a position that the Commission wants to take either. We want to make the data available, but we want to manage the risks to the individual customer appropriately.

And there are four basic buckets that as you start to develop aggregation methodology you have to manage over the course of time. So as you have granular data, you have geography. So the smaller, smaller blocks you go and the more granular the data, the greater the risk to re-identifying the customer.

I also understand that it's also more valuable. So as you start to, you know, have larger granular time and larger geography, you have lower risk of re-identification. And time frame. Do you want the time frame over all customer usage over an hour, over a day, over a year.
And of course, customer classes themselves pose a different level of risk. So where you have a ZIP Code with 100 customers or 1,000 customers, that has less risk than a ZIP Code with one industrial customer.

COMMISSIONER McALLISTER: Could you maybe characterize the -- so you had a lot of different stakeholders on that issue and I imagine this was probably an area where they disagreed at least somewhat.

Could you maybe characterize the conversation about, you know, where the various stakeholders were? You don't have to name them, but how wide was that spectrum of how big a deal this re-identification risk actually is?

MR. VILLAREAL: The private advocates, obviously, were very strongly concerned about the risk of re-identification. They would argue that there is no data set that you cannot re-identify somebody from.

So if you have an energy data set that has, you know, simply a line of one to 100 usage and let's say a ZIP Code, you can then take that information and match it with other publicly available sources of information, perhaps from the
Assessor's Office.

And if you have a big enough or robust enough algorithm you can then do a reasonable job of re-identifying which usage goes to which customer. I don't think we were -- that's -- obviously, if you wanted to avoid that you would have no data available.

COMMISSIONER McALLISTER: Well, I guess my -- and I don't want to put you on the spot, because you're facilitating. You're not -- you know -- I mean, I'm not saying you're owning this stuff, per se, but like, that's kind of exactly where we want to go with policy, is crossing energy with buildings data, with, you know, other kinds of data to inform where the opportunities and then offer the right services, depending on what that indicates, and right, whether that's -- you know -- who does that and how it happens and all that, that is a process question.

But I guess, you know, kind of like if I'm a local government and I want to know how I can reach my carbon goals, I need some --

MR. VILLAREAL: Right.

COMMISSIONER McALLISTER: -- I need to be able to match up the energy data with the buildings
data to have some reasonable policy in place, right?

MR. VILLAREAL: Correct. And I'll answer it this way. The fourth, fifth person, the fifth bucket in here, which is not identified, is the requester themselves.

COMMISSIONER McALLISTER: Right.

MR. VILLAREAL: Local governments have a very clear interest in getting the information to meet certain requirements. Many third parties have a very positive need to get the information. So we aren't -- what our rules -- and this is what it does, is it enables local governments to get the information, but as it applies to the market we have not gone that step to allow market -- the market to get this information, and I'll say it for a reason.

The people in our proceeding, as in your proceedings, are good actors generally. They want to do positive things for the state and to meet our energy policies. So if we made one characteristic of, this is how you get information for everyone, the good actors will do good jobs with it.

The bad actors will go in and say, oh, look at all this information I can get that I don't have to do anything with and now I can do all sorts of bad things with the information. And unlike other
aspects of our lives, once something is gone we can't give the data back.

The data is out there and there's nothing that the Commission can do or the utility can do except be sued to get that information or protect that privacy back. So this decision is our first step into doing this, and I fully expect the Access Committee and the utilities and the Commission in general, with working with everyone in this room and who wants to participate in the PUC proceeding, to keep moving forward.

COMMISSIONER McALLISTER: I really appreciate that. I mean, this is a tough, tough area and we're --

MR. VILLAREAL: It is; it is.

COMMISSIONER McALLISTER: -- we're navigating it.

MR. VILLAREAL: And of course, our statutory authority, which is slightly different than yours, says we have to protect customer privacy. And so we have to come up with ways to lower the risk of re-identification of customers, but also get the data out there. And this is just simply the first step in getting that done.

So with these four buckets there we've
adopted several different aggregation methodologies, based on the premise that the data, the geography, time frame, the customer class themselves provide different levels of risks.

Hopefully, this will all be posted on the web page. This slide and the next slide I just put up there for you to read later.

(Laughter.)

MR. VILLAREAL: What it generally says, these are the aggregation methodologies that are on the utilities for the public posting of data. What I'll point out is the residential class has a different aggregation methodology than commercial or ag or industrial.

Because, as I pointed out, this is our first step, we want data to be out there and we didn't want to be too aggressive on getting data publicly available, because we don't know what the market wants to do with this data.

We don't know who the good or the bad actors are with this data, but we wanted to get some of meta data out there. And we figured this was our acceptable level of risk as of May 2014. Again, these can all change going forward, as technology progresses, as research with data queues progresses,
these methodologies are subject to change.

But for today, these are the aggregation methodologies as it applies to the public posting of information. This, these, are the aggregation methodologies for local government. Local governments have a very clear need and a direction to get customer use of information to satisfy certain goals and statutory mandates.

Again, these are our first steps at making this happen. As things continue to progress, as risks change over time, I would expect these things to be modified, as well. One of the main differences, well, there are several differences between what you saw and this one.

The aggregation is much lower for residential and all of them have a percentage of load. So if y'all are familiar with the 1515 store where you have to have 15 customers and no one customer can be more than 15 percent of the aggregation, that's kind of how this works.

So for example, if the first bullet, res, commercial and agricultural customers, you must have at least 15 customers in that request and it's by customer class. No single one of the accounts must be more than 20 percent of that aggregation.
There are other requirements put in here, as well, around anonymized data. For example, if a certain request has a handful of solar customers that are very obviously identified in the anonymization set because they are zero, those have to be removed because they have been identified.

You can easily take publicly-available sources of information to identify who those are. But this is, again, read this later. It's all in the decision. The third part of our decision was creating a data request and release process. Now, this is intended to streamline the process so that all the eligible entities, and by eligible entities I mean universities and local governments, and potentially other federal, state agencies seeking information, can now have a single point of contact at each utility.

They know what the process is for getting information because we are told for too long they would make a request and they would wait and wait and wait, and the utility would finally get back to them with some answer that they either did or did not like, and they had no alternative means to request changes or something else -- or change some other way to make the request.
So the utilities are also going to create a website, in fact, I think it may already be online, to identify all the -- create a catalog of all the requests they've received. I have identified what the process is so that everyone knows what the rules of the road are.

So they know -- the requester knows that the IOU got it. They know that the form is complete or incomplete. They know when to expect the data or not to expect the data and they know what they have to do to change the request if the data cannot be provided.

Any disagreements between the utility and the requester can be informally provided to the Energy Data Access Committee, and the next slide will talk about that. Prior to getting the data you have to complete an NDA and this decision provided a model NDA so that local governments do not have to abide -- do not have to sign NDA.

And the IOUs can notify the Executive Director of the PUC that they are making the data available. The PUC encouraged the utilities and the requesters to use standardized formats as much as possible, in other words, XML or CSV is the preferred format.
Additionally, the delivery of the data should be done in a standardized manner as much as possible, as well, including, and the Commission specifically identified, it should leverage the funding that the PUC approved for the utilities to utilize the energy services provider interface, NAESB REQ 21, which is the standard underlying the green button.

I should note that I am the Task Force Chair at NAESB for that standard. So I'd be happy to answer any additional questions later on about the standard itself. But we've provided utilities direction and funding to use the SB Standard and we'd like to see that funding leverage much as possible.

Finally, we directed that no fees at this time shall be assessed upon any of the requesters, but to the extent the IOUs determine that they have been getting a lot of requests, they are free to request a fee in the next GRC case.

COMMISSIONER McALLISTER: Chris, did you identify funding needs or did the utilities bring up any funding needs for just developing the IT infrastructure to generate the responses to these data requests?
MR. VILLAREAL: The utilities always request funding to implement any of these directions to utilities -- or from us. They did say that this would of course cost money, but in this proceeding, since from a legal perspective it was not a rate-making proceeding, we said that they should use a -- not memorandum -- balancing account.

COMMISSIONER McALLISTER: All right.

MR. VILLAREAL: At the Commission to track their costs.

COMMISSIONER McALLISTER: Okay.

MR. VILLAREAL: So that in the GRC they can recover their costs then, or utilize existing budgets.

COMMISSIONER McALLISTER: Okay. So yeah, I guess we heard Ethan in the morning and I think a couple other people alluded to something like this, where -- and then you just said they're free to request some kind of fee structure.

But I guess there's also a lot of argument that, well, there's some social benefit, public benefit to this, and maybe it is rate -- you know -- ought to be rate based a little more broadly and this IT infrastructure is going to help everybody.

So just wanted to see -- I mean, was that a
part of the conversation in the proceeding among the stakeholders?

MR. VILLAREAL: Not explicit -- I mean, there were parties who raised that.

COMMISSIONER McALLISTER: Um-hum.

MR. VILLAREAL: But since this was not a rate-making case we could not make such determinations.

COMMISSIONER McALLISTER: Okay.

MR. VILLAREAL: All we could say is the utilities should track their costs for many of those reasons, because the Commission -- I would agree -- likely believe that to the extent these costs are de minimis or not a lot, it can just be recovered through the rate case.

So they're going to get their costs of service recovered anyway. It's just a matter of how much of that should be borne by requesters versus --

COMMISSIONER McALLISTER: Versus the public, yeah.

MR. VILLAREAL: -- versus the public as a whole.

COMMISSIONER McALLISTER: Okay. Great.

Thanks.

MR. VILLAREAL: This is a bit of the Energy
Data Access Committee. Again, my colleague Amy
Reardon is the PUC representative shepherding it
through. It is to provide assistance to the IOUs in
their data access programs.

Again, this would be at least as imagined
in its decision where ongoing discussions around
aggregation methodologies would be held. This is
considered in forming any disputes, so if a
requester says I want data that does this, and the
utility says, no, you can't have that because it
violates this rule y, they can go to the committee
and the committee can informally advise both parties
of this solution.

Neither party has to accept it. The hope
is that they both will. But the PUC retains the
final authority to arbitrate any decision in any
disputes, should either of the party want to come to
the PUC to do this.

It consists of representatives from across
the board, including the CEC Commissioner,
researchers, consumers and privacy advocates and
other interested parties. I believe Michael Murray
is on it, as well, or at least he participates.

By the Commission decision they are to meet
at least once a quarter for the first two years,
then as needed thereafter. The first meeting was held April 6th in the Bay Area. The next meeting is scheduled to be in July in Southern California at SoCal Gas.

And as noted, the last bullet is, again, this is the form where the Commission hopes to get the -- get individuals interested in this topic to start discussing what's next. What are the issues that the Commission and the parties see coming up next?

For example, when we talk about building benchmarking, a, the Commission has been very supportive of getting the consent up front from the tenant with the landlord. So how does the lease need to be revised so that customer consent is done in the lease as opposed to some later document?

And so what is a legally binding language in the lease that the utility would accept, the utility lawyers would accept? That's the type of issue that may come up in the context of this committee, to get some ideas going, get some new ideas generated, and hopefully, get some solutions so that we can start avoiding some future implementation problems, because as the first step there are growing pains.
And as we continue to move forward we will identify new growing pains that hadn't been considered before. And this is a way for everyone to discuss how to find solutions, creative solutions to these issues.

And with that, I'd be happy to answer any questions or I can deal with them later, Commissioner.

COMMISSIONER McALLISTER: Yeah, let's -- I think let's move on. I know we're all looking forward to maybe even running over business hours here, so hopefully not. Thanks a lot, Chris. I really appreciate you and Amy being here today, and George Degneba (phonetic). I saw him, as well. So that's great areas. So I'm really looking forward to working with the PUC on this.

MS. RAITT: Next, we have the Utility Panel. So the folks on that, if you could come up to the table. And we also have one participant joining us from WebEx on this panel. We have Jonathan Changus from NCPA on WebEx.

MR. JENSEN: So well, thank you, Heather. So these panelists received some questions regarding their --

COMMISSIONER McALLISTER: Okay. Somebody's
got some feedback on the line here. Could you mute yourself on the phone, please?

MR. JENSEN: Maybe we'll have Jonathan mute his phone until it's time for him to go. Anyway, okay. So these panelists received a set of questions regarding their respective utility's practices on sharing data with customers, the market and policymakers.

Here in the room we have Manny Alvarez and Mark Podorsky from SoCal Edison, Jan Berman from PG&E, and as Heather mentioned, on the phone we have Jonathan Changus from NCPA. He'll be talking about POUs. So let's go ahead and get started. Manny, would you like to start us off?

MR. ALVAREZ: Yeah. This is Manuel Alvarez, Southern California Edison. I'm in the Regulatory Affairs there and I've come before the Commission a number of times, and over the years I've dealt with a lot of these data questions and issues.

I'm not going to specifically talk about that. I'll let Mark get into the specifics of data. But I guess I just wanted to kind of express, you know, some views here in terms of some of the evolution that we're involved with.
I think this particular topic is timely. We're all facing a number of industry changes, as well as governmental changes. The technology of data management, collection and processing is definitely going through an evolution. Edison itself is actually going through an internal structuring of its IT and its information and its data management system. So it's real relevant to what it is that we're doing, as well as how we provide it.

The transition to the distribution planning process, I think we're all aware that the utilities will be filing those reports or those proposals before the PUC in July, and we'll look at the evolution of the grid and the implications of energy efficiency, demand response and distributed generation.

Plus, we have our implications of the SONGS development, the SONGS shutdown and what's going on in the PRP, and so there's relevance there. So there's a number of areas where things are coming together in terms of the evolution in the management of this data and information going forward and what decisions the utilities think they have to make, as well as the regulators, both the PUC and the CEC,
they have to make what decisions and what to do where. So I think it's timely.

At least some of the things I heard this morning I was pretty pleased with, the groups that are being organized for data access, as well as the proposal I heard earlier today for an ad hoc group to kind of begin to discuss those kinds of issues.

I think working groups work really well. I think the Commission has used the Demand Analysis Working Group to deal with some of the forecasting methodology questions and debate that goes on, and that seems to be working.

There hasn't been too many conflicts, at least that I'm aware of, but I'm sure there'll be a few as we go through this IEPR process. And the other issue that I find intriguing is this discussion between the privacy and the need for the public interest decisions need to be made.

I think that's an area still where there's a need for some discussion at some point. You know, where those edges are, what are the implications on some of the privacy requirements, as well as the need for the public interest decision.

So perhaps in our comments when we filed with those, we'll give you some guidance on where we
think some of those edges can be and we can discuss those.

COMMISSIONER McALLISTER: And also, I would just say, just to interject, I mean, so part of it is it's great to hear that you're revamping your IT infrastructure and everything, and I think there's an opportunity to, where data has to pass between entities.

You know, say it's one of the Commissions and you guys directly or some system that we think about what the standardization and the protocols look like and work through those issues to make sure that we're all sort of talking the same language going forward.

MR. ALVAREZ: Right. Now, I understand, and I think the cyber security question came up, also. I think that's very relevant in terms of issues that we're dealing with, our data and our information. So with that, I'll turn it over to Mark, and you know, he's the point person at Edison where the rubber meets the road and he has to kind of deal with how we manage our data and actually get it out and about.

COMMISSIONER McALLISTER: Right.

MR. ALVAREZ: So Mark.
COMMISSIONER McALLISTER: Great. Thanks, Manuel.

MR. PODORSKY: Okay. Thank you, Commissioner. Thank you --

COMMISSIONER McALLISTER: Microphone, please.

MR. PODORSKY: -- for having us. I am Mark Podorsky. I oversee and manage a group called Information Data Governance. So excuse my hoarse voice. I'm just getting over some of the crud I think everybody have probably gotten over the last week here.

But data is very important to me. I love data. I live data. So I appreciate the folks that understand the value of data and what it brings to the table to help solve problems. I will tell you, from Edison's perspective we also think the customer is the owner of their data.

However, we do feel that we are the trusted custodians of that data, and as any trusted custodian we have a responsibility that comes with that. And so we are very committed to our privacy and security rules and policies that we have in place to protect that customer's data as their custodian.
And I say that not because in the spirit of sharing data to advance all things good. We're in a place where we have to follow policy and we have to follow decisions. And oftentimes we're in a place that doesn't make it easy for us to do that.

But that said, we are behind partnering with folks to do the things that we can't. We're a utility. We know we're not great at everything, right. So we want to bring and partner with those experts that can help us achieve goals and help us achieve state goals.

So we want to help support you guys. We want to share the information that you need to do your jobs. We just have to do it within the bounds of the rules and decisions that we have been given. So I'm glad Chris went through the latest decision, because I think it helped frame up the environment that we have to operate in.

But I will tell you a couple things. We want customers, certainly, to have access to their own information and we do it through a variety of ways. Whether it is through their "my account" to look at usage, run reports, forecast a bill prediction, next bill, bill alerts, all the things a customer should get, we have provided those
opportunities through our portal.

You know, secondly, we understand that customers want to be able to download insure their data. So we did ask for a funding for what we call our SB Platform. The first applications to run on this SB Platform was the Green Button.

We did it in three phases. Green Button initial phase was so customers can download the data that they were looking at on their web page in CSV human, readable format. The second phase of Green Button was to say, forget just the web page that you're looking at, tell me what did you want to download, how long a period of time and do you want it CSV or XML.

Theory being, if you downloaded XML, that's machine readable format, and then you can share that file with whatever third party that you authorize and choose, right. So we give the customer that flexibility.

And then finally, Green Button phase three we implemented, I think folks know it here as the Green Button Connect My Data. So that is where they can not only download their data, but they can choose a third party of their choice that will provide them value added services.
They can connect their data with that third party, authorize that third party, and we will send them not only historical data, but periodic, mostly daily feeds of any incremental data or prior period data changes to that third party, automatically, machine readable, on behalf of the customer.

So that is one way that we try to share the data and get it out to third parties, if the customers choose. Then according to the ruling that Chris went over, specifically Decision 140515, we did take the necessary steps to comply with that ruling.

So we did create a web portal specifically where third parties, whether it is government entities, municipalities or research institutes, to come and request data. It's not specific data. You tell us what you're looking for.

In fact, the joint IOUs worked on the request pages together so that they were consistent. And it's free form boxes that really say, what kind of data are you looking for, what are you trying to use it for.

And then through the necessary process apps, we'll say, who is the requester; do you have authorization; are you registered; are you -- did
you sign an NDA with us and all those things. And then we'll take the necessary steps to either deliver on the data that they asked for, or we go back through and say, look, we can't give you this detail level of data you are looking for unless you get customer consent.

However, if you're willing to take it in this aggregated format I think we could do this for you. So it's not just a one and done, come onto the request page, ask for some information and I can't give it to you, I say no.

I say, here's the rules I have to live by. I can't give you this, but maybe I can give you this; will this help you. And we'll work through them, at that iterative process with the requesters to make sure at least we're getting them some information that they can use.

So I think that was another step forward in helping information get out there so that we can share it. And then the third thing again, according to the ruling, is I am a sitting member of the Energy Data Access Committee.

So as issues come up around data access and what we can and can't do, I think that's the perfect place, and I would encourage the CEC to leverage...
that body so that as we come up with issues or
questions around what data should be accessible or
not, or what level of authorization does it need, I
think that would be the perfect body with the
correct participants to address those issues.

So those are some of the things around data
access that, you know, I feel that we are doing
everything we can within our rules to help support
the market. I do have a list I was jotting down of
what I saw as some of the barriers, specifically
because, as Manny talked about, we're going through
our IT restructuring.

Everything costs money nowadays and the
more we can use standards, the more we can leverage
the tools we already built. That would be
preferable, instead of asking the ratepayers to fund
more solutions that maybe we don't need to do.

So when I talk about some of the barriers
and some of the hurdles we have to get over to make
this work, I think we do need to look at standards.
The SB standards Chris talked about, supported
through NAESB, again, are a great start.

The first rev of it was really based around
usage, but the standards body is opening it up to
additional data items, specifically around billing,
billing determinants. I think if there's any questions around what should be part of that standard, we have a seat, I think a couple of folks have a seat with the standards body.

If there's some piece of information or data that's not in the standards, let's ask them to get it in the standards. Let's not create another standard, right. So I think that's one of the ways that we can work with the standards bodies to, one, make it consistent, but then get all of the things that we need into the standards and leverage the standards.

Second thing, I think we talked about actually at the first EDAC meeting last week was around data definition and data dictionary and terms. It would be great if we could all get on the same page as to the data items and data definitions.

When somebody says "usage" to me, first response is, what kind of usage. Are you looking for estimates? Are you looking for best available? Are you looking for actual? Are you looking for real time, new real time?

So those are the kinds of colors and attributes that we also need to tee up around the data items. And then I think for consistency, if a
third party says, I need data X, all the IOUs, all
the third parties, everybody understands what data
item X means and there's no questions about, when I
get X, oh, that's not what I meant, I meant
something else, right.

I think that's where data definition, a
data glossary, data terms and certainly, data
attributes come into play. I also like to think
about what I call the transport method. Pulling
data and putting in a file, to me that's the easy
part.

Making sure that it's secure, making sure
that it gets to a secure website where somebody
could either get at it with a token, because you
already did a pre-determined, technical handshake so
that you can get the data out of that mailbox in a
secure place, that's what I call a transportation
model and it's all wrapped in, how do I get the data
out there in a safe manner to a safe place where a
trusted person with lock and key can pick it up.

The next thing I'd like to talk about is,
kind of how do we support the market and make it
work, right, and that comes down to I think the
customer experience. One of the things people don't
want to do is have to go onto the IOUs website, get
a password, login, and say, yep, I authorize this third party and then jump to the third party website and say, oh, now, I've got to set up a sign on and account here, then I can pass my data.

So I like to think we're going to advance in terms of all getting on the same page around single sign ins. Single sign ons should make that experience easier so that once you sign in one place you can go between the different vendors and people that you had authorized and easily go onto their sites and see the results without actually having to do all of that re-logging in.

And then, certainly, I think the last piece or hurdle that we need to look at is, everybody understanding the privacy, security rules, and then what would governments, what would third parties, what would research institutes have to do to be able to play in this game.

And we had an interesting conversation last week at EDAC. Again, the utilities can post on their website. If you're a research institute looking for data, here's what you have to do. You have to be accredited.

You have to state your case with the Commission to make sure that you're working towards
some goal that we're all after like energy

efficiency, right. You have to sign the NDA. All
these things that folks have to do to play in the
game, it would great if it was posted on a single
site so that you didn't have to jump from IOUs
website to IOUs website.

But if you can get all of these rules, all
of what's the obstacles and hurdles to even get in
the game, it would be great to have it in one place
so that it is consistent, so that I'm not getting 15
phone calls a day about, how do I get in, why can't
I get my data.

And I think that would be a great way to
help everybody play in the market and understand the
rules and participate fully so that we can achieve
the goals that we're all after.

MS. BROOK: Great. This is Martha Brook.

I just wanted to ask one clarifying question about
the Energy Data Access Committee. Is the scope
billing data or does it also include utilities from
the program implementer perspective, data about
project costs and savings?

MR. PODORSKY: So I'm going to ask maybe
Amy to speak to that.

MS. REARDON: Sure, anything. You know, I
COMMISSIONER McALLISTER: Amy, can you come up to a mic. Thank you.

MS. BROOK: You can come here, Amy.

MR. PODORSKY: Called on you.

MS. REARDON: But I've got one of those voices. Amy Reardon, with the California PUC. My understanding that any data is actually covered under the Energy Data Access or Data Request -- DRRP -- Data Request and Release Protocol.

I guess, you know, I'm in energy efficiency, so I get very siloed into that and I start thinking, well, it's all about, you know, energy efficiency data, but of course not. I mean, a lot of the requests that I'm seeing internally have to do with people trying to locate distribution lines or identify distribution lines for certain substations, or stuff involving research adequacy work and like the SONGS, I mean, a real variety of different requests.

On one hand, that makes it difficult to create an off the shelf data model, you know, but you know, because it's such a wide range of requests, but we're working on it.

MS. BROOK: Okay. I think the first group
of questions we asked you guys to consider were really trying to focus on consumer needs for data, and so that's why I brought up the cost and savings. I don't think we provide anything near the adequate in information about helping people make decisions about how to invest in energy efficiency.

I don't think the calculated or deemed estimates work. I think they need to see actuarials. And so I'm wondering if we can come and talk to the committee about getting the market, that kind of -- that type of data.

MS. REARDON: Well, that's one of the reasons why the committee exists, is to find out, you know, how this is going to unfold in the future. So we certainly welcome any and all participation.

COMMISSIONER McALLISTER: So let's move onto the next. I guess Jan and then Jonathan, probably?

MR. CHANGUS: Yeah.

COMMISSIONER McALLISTER: Or -- yeah.

MS. BERMAN: I'm Jan Berman, Senior Director of Energy Efficiency Strategy from PG&E, and in the interest of time I'll just call this, 10 ways to get your data from PG&E. They're pretty similar to Edison's ways.
Number one, you could go on "My Energy," which is our website, as a residential or business consumer. You could get a best rate analysis that uses 12 months of actual billing data to examine your best rate situation.

You could also get, for residential consumers we call it a neighbor comparison, to similar houses in your same neighborhood. For small business it would be a comparison to similar small businesses.

There's load disaggregation analytics on the web if you want a rough estimate at which of your loads is using how much. Also, weather normalization analytics on the web, and finally, a progressive energy audit tool.

What that does is it allows you to go on the web and input your data over a period of time and get increasingly customized tips as your data set gets more robust, but you don't have to do it all in one sitting and it saves your data.

Those tools are backed by our partners, OPR and C3, who won the original contracts to do those tools, but they are something that we redid. Number two would be the Home Energy Report. Right now, we have about 1.2 million residential customers that
get the Home Energy Report and another 750,000 in the control group.

We're also piloting business Home Energy Reports, if you will. I think the success of the Home Energy Report in actually driving energy savings poses the question from my perspective, will we get to a point where we don't want control groups anymore because we actually want everyone to get it, because as much as we love the web and we all really love to look up our energy data on the web, it turns out paper is actually pretty effective with residential consumers.

Our partners on those reports are OPR for the residential and Inter-knock (phonetic), formerly Pulse, for the small business. And number three, Download My Data, also known as Green Button, which I think Mark already covered how that works.

Number four, Share My Data, which is also known as Green Button Connect My Data, and that Mark already talked about, as well. It's just a system where customers can provide an online authorization to share their data on an ongoing basis with specific providers.

Number five, the good old Customer Information Standardized Request process, or CISR,
still exists. So that's the old-fashioned way to request info from your utility. Number six, the new-fashioned Energy Data Request Program, which Chris covered quite extensively, and Amy, as well, that the EDAC Committee's been looking at. So I won't cover that any further.

Number seven, the Green Communities Program. That's one I started working on in about 2006, and then we got energy efficiency funding for it. That program is specifically for local governments of all types to work with us on obtaining data they need for climate action planning.

Number seven [sic], Stream My Data, which is also known as Home and Business Area Networking, and that provides inner -- sorry, that was number eight, Stream My Data Home and Business Area Networking. That provides the link up for customers who get a home energy network or hand device or the business version of that device to connect the device and their meter information.

Number nine is building benchmarking. That's something we've worked on for about seven years and I'd done a lot of working partnerships with cities like San Francisco that have passed
benchmarking ordinances. And obviously, we've
talked about 1103 quite a bit already.

Some of the things we've done to facilitate
that are build the automated data transfer into the
portfolio manager tool, because previously,
customers were having to retype their data in, which
is quite irritating and time consuming.

We also do training about 12 times a year,
live training. We have a web training course and we
have a call center to help people. Some speaker
noted earlier that it's perhaps not the easiest
process, but we are trying to provide a lot of
support for our customers or their consultants who
are doing benchmarking.

And then finally, 10, I wanted to give a
nod to the EE Stats website and the CSI website,
both places where we're providing information that
gets uploaded into data sets that is statewide. And
I will stop there with 10.

COMMISSIONER McALLISTER: Thanks, Jan.

That was great. Very efficient.

MS. RAITT: So next we have Jonathan
Changus on the WebEx, and I'll just mention that we
do have some time constraints and we need to --

MR. CHANGUS: I don't (inaudible) --
COMMISSIONER McALLISTER: Heather, do we have a presentation for Jon?

MS. RAITT: Yeah, we do. Just one moment.

COMMISSIONER McALLISTER: Thank you.

MS. RAITT: That was just --

MR. CHANGUS: Yeah. This is Jonathan.

MS. RAITT: Okay.

MR. CHANGUS: And I apologize for not being able to be there in person, but I have a slight fever. So I'll be doing this remotely. I had some initial questions directed to me about the difference between IOUs and POUs and I think that's kind of a good place to start.

If you go to the first slide, I'm going to start with the (indiscernible) of public power, and this is an awkward chart and I've tried to find a better way of displaying this data, but what we're looking at is the retail sales POUs across the state.

And what we're seeing is that you have SMUD and you have LAWP and we pretty much have everyone else in the tail there towards the big Pittsburg Power. And these are incredibly small communities and cities that have very small loads, biggest I believe, and this one is about 16,000 megawatts
hours compared to over 22 million megawatt hours for
Los Angeles.

And so the customers that we serve, their
interest, their sophistication, what their needs
are, are very specific to the communities they live
in, as well as their climate zones, the economies.
There is very targeted issues and concerns that vary
significantly from each community.

And the second slide kind of helps share
how this compares to the IOUs. It's similar data,
comparing retails sales of POUs versus the IOUs.
And so if LAWP was significantly larger then, you
know, the smaller POUs, then you look at how they
compare to PG&E and SCE.

And the smallest 20 POUs are incredibly
tiny. This is going to have a direct impact on the
resources they can bring to bear for things like IT
upgrades and services that are kind of a necessary
backbone to providing more granular level data.

In general, I per CEC staff request,
surveyed POUs, not just in CTA numbers, but
(indiscernible) simulate, as well, on you know, the
prevalence of Smart Meters. And while some, such as
SMUD, are very close to having kind of a full
deployment of Smart Meters across residential and
commercial customers, that's really not the case for
a lot of other small utilities in which a
(indiscernible) roll out is maybe still three years
plus away at the residential level.

In addition, a lot of these utilities do
not have a specific IEP department to help support.
So the same folks that are the account managers and
ingineers also wear in many cases the IT hat. And
so the reporting and the collection of data
evervisioned will disproportionately impact the
smaller POUs versus the state's larger utilities.

I do want to note that there has been an
incredible amount of really quality data. I'm very
interested in reading more about the CPUC decision,
and in particularly, about this issue of privacy and
versus access.

I think for us, as we mentioned in our AB
1103 comments, the code section that we look at that
makes us nervous or that we're most concerned with
is in the Government Code and it's Section 6254.16,
which makes pretty clear what we can and can't do as
far as disclosure of utility usage data.

There is some possibility there's some
direction that allows us to provide to government
agencies, to local agencies, but I think the area
where we get most concerned is with the third party vendor or to the market.

And I think one of the things we're really looking for is some clarity as far as how we're not liable pursuant to that statute for a broader disclosure. I would also echo I think some of the comments and concerns of Matthew Hargrove regarding the kind of mixed messages as far as we want anonymized, aggregated data, but then we continue to have reinforced, no, what we really want to do is pair and match up building specific information with customer utility usage data, as well.

And I think there's probably some -- on the anonymized and aggregated level, especially after what we just saw from the CPUC, some space and scenario in which that could be possible without changing the statute.

But I think that we have some serious concerns with respect to -- I think came from both the CPUC and the CEC there's talk on how 6254.16, how it applies or doesn't apply, as that's been I think one of our main areas, legal issues.

Beyond just the potential statutory constraints or challenges, I think there's also a huge issue about the cost to doing this and what it
means we're not spending money on. And the
collection of data, especially equipping customers
with data, I think is an area where we would be in
full agreement.

We agree that the usage data is very much
that owned by the customer, but as I think was
mentioned eloquently about the utilities view
themselves as custodians of that data, and needing
for things to be very explicit in how a utility can
be protected from making this data more available,
since the Legislature in a couple of its arenas has
been clear that privacy is something that we need to
honor. So with that I'll turn it back over.

COMMISSIONER McALLISTER: Thanks, Jonathan.

MS. RAITT: And excuse me. I was just
going to add that we do have some time constraints
and we'll try to wrap this up, this panel up, at
3:40 today. Thank you.

COMMISSIONER McALLISTER: Okay. We may be
able to do it more quickly, then, I think.

MS. RAITT: Oh, great.

COMMISSIONER McALLISTER: And then we're
going to go with a speaker, flip the next panel so
that our external speaker from LBL can go first.

Well, see, I have just a couple questions. I'm sure
others do, as well.

So what is the -- like with your respective utilities, at least Edison and PG&E, what percent of your customers -- well, so let me first say. I'm a PG&E customer now and I think of the 10 Jan mentions, I've probably used, let's see, about either four or five of them.

I might not be quite matching to the 10, but in any case, my energy -- I'm not sure if I'm the control group or the participant group in the Home Energy Report. Green Button, Green Button Connect, yeah, maybe that's it, and you know, obviously interested in benchmarking green communities and all that kind of stuff.

So it's good to sort of have the panoply of pathways listed. I guess, talking about Green Button and Green Button Connect, you know, what percentage of your customers are actually participating in those? Like, who's pushing -- what percentage are actually pushing the Green Button and either authorizing a third party on an ongoing basis to work with their data, or just getting it one time and, you know, through Green Button.

MS. BERMAN: I don't have an exact percentage with me. So I'll follow up on that. I
don't think it's what you would call a large
percentage, and I would characterize you as an
unusually engaged customer.

COMMISSIONER McALLISTER: No doubt. But
you know, I think probably everybody in this room is
not -- I mean, none of us are typical, right? But I
guess part of the message in that 758 action plan is
to the extent that we already have these tools, we
need to make them inter-operable.

You know, and I'm sympathetic with Edison
on the, you know, you want to sort of help others
get the data that they are due under the
interpretation of the decisions and everything. But
I also think part of it is avoiding bottlenecks to
the absolute extent we can.

And so to the extent that we can make those
processes not sort of discretionary on anybody's
part, like, look, this is what's going to happen and
it's pretty plug and chug, and then push out to as
many people as possible, get the word out, you know.
I'd love to have a, you know, world aware,
you know, not necessarily that everyone was
interested in the same things I'm interested in,
because that's not going to happen, but that the
right kinds of information, the diversity of
information, the particular things that each
customer might want to see, is available easily and
simply and automatically to them.

So I guess ramping up, you know, to get to
that big percentage of people, seems like that ought
to be, you know, kind of how we put our communal
heads together in some ways so you get that
percentage up, I guess, and do you have any thoughts
on that?

MS. BERMAN: I mean, my expectation would
be that the market will drive that, because
customers will be searching for some assistance
from, you now, many market actors, and as part of
that -- and Mark spoke to the one sign on process --
it'll get to a point where they're on that site, ah,
this is exactly what I want, oh, click here to share
your utilities data with the provider.

So it'll become more seamless, but I
wouldn't expect us to get the percentage up, because
utilities send out huge marketing campaigns saying,
go on and share my data. I would expect it to come
from the desire for products by the customer.

COMMISSIONER McALLISTER: Who controls or
who selects the third parties that are eligible to
link up with the Green Button Connect?
utility that evaluates them, or is there some -- is it anybody who wants to can come up and plug in, or is there some minimum standard?

MR. VILLAREAL: Yes. So there's four steps that a third party would have to do to satisfy to be eligible to be Green Button Connect. The first one is you have to utilize and show that you can use the standard, the SB Standard. So it's predicated on the use of the standard.

The second one is acknowledgment of the PUC privacy rules adopted in 2011. The third one is that you're not a prohibited party on the PUC side, and I forget the -- oh, you have to provide the utility with contact information.

You have to tell the utility, I'm Joe's Data Shack and this is how you can get a hold of me. The PUC has decided that addressing the liability risks that the utilities told us in the proceeding, what we've said is the third party, by interacting with the utility, acknowledges that there are certain rules that they need to follow in order to be that good party, to be that good advocate in the market.

If the utility suspects that the third party is violating some aspect of the rule they are
to notify the Commission of this third party, and then the Commission would investigate whether that third party is indeed violating the rules.

Until the Commission makes the determination that the third party's in violation of the rule they continue to get the data, unless the Commission acts that -- decides that they are violating, or the customer makes the decision that he no longer wants the data.

COMMISSIONER McALLISTER: Right.

MR. VILLAREAL: At the end of the day we can adjudicate that, but the customer still maintains its role in overseeing how long or with what third party. But that is -- I mean, we think that's a pretty low bar, to try to not create barriers to the third party marketers and service providers that want to go out and utilize the standard.

Again, show that you can use the standard, that you can integrate that standard the way the utilities integrated it, and then you're all set from a technological side.

COMMISSIONER McALLISTER: One of those -- maybe Martha's going to ask the same question I'm thinking of, about the quality control over the
analytical firms or?

MS. BROOK: Well, I was just going to just look at that question a little bit, because when we did some preliminary research it looked like the list of third party tools were very different, depending on which utility we were shopping at. And so that's why I was originally intrigued about, well, how are you making the decision about who you list there. And so that's sort of a follow-up I think to Andrew's question.

MR. VILLAREAL: From the Commission's rules perspective, as long as you satisfy those four requirements, that's all you need to do to get on there. Now, how you interoperate and exchange information via the standards, I would expect it's not unusual to see slight differentiations of usage of the standard.

And that's just something that we have to continue working on, is to make sure that the utilities are implementing the standard in a consistent manner. Some third parties may not want to participate in some parts of the state. I don't know. That's completely up to the market to decide. Maybe they decide that it's better to work in San Diego's territory than Edison's or PG&E's.
The standard is there to do lots of things. And as Mark pointed out, the SB Standard is capable of doing lots of stuff.

We haven't the utilities -- and we haven't directed the utilities to enable all the other things that the SB Standard can do. It can do building determinants. It can do power quality. As long as the utility starts collecting this information and then we direct or someone -- or the utility decides that there's enough market need to have this, then they can make this data all available.

The standard really isn't the bottleneck here. It's the market and we're waiting for the market to progress in a way that really will want to utilize the vast services that the standard itself can provide.

COMMISSIONER McALLISTER: That's very helpful. I guess I was wondering, do you see a need -- so maybe -- who's the gatekeeper for who actually gets in? Is it just any firm that checks those four boxes can just waltz up and PG&E will immediately put them on their website or --

MR. VILLAREAL: That is the intent of the decision. I will leave it to the utilities to tell
you how they are actually doing it.

MR. PODORSKY: Actually, because there is

the security piece, that token exchange that we have
to do.

COMMISSIONER McALLISTER: Yeah.

MR. PODORSKY: I call it the technical

handshake. In the old days, I'm kind of an old guy,
we used to call it a penny test with a bank or --

COMMISSIONER McALLISTER: Is that beyond

the standard that Chris was talking about?

MR. PODORSKY: It's part of the process to

implement according to the standard. So because

there is an authorization piece and a token exchange

piece, it's that technical handshake, exchanging the
tokens, make sure you can open up your mailbox when

I put data in it.

COMMISSIONER McALLISTER: Yeah.

MR. PODORSKY: That kind of thing has to be
tested with a third party, and we do it on a first
come, first serve basis. So again, we're not trying
to evaluate or judge anybody. If they pass those
qualifications and they can do the technical
handshake with us, then we list them on the drop
down box.

COMMISSIONER McALLISTER: Well, so one of
the things that is in the action plan is actually,

you know, I guess it's a question. Is there a need

for kind of minimum quality standards for these

analytics firms, you know, so that we know that,

okay, once they get approved by you maybe there's a

need for some minimum bar of standards of quality.

If they pass that, then the utilities then

have to put them on their website and then they can

know where to go.

MS. BROOK: Yeah. Well, from the point of

view that they're making recommendations on

improvement strategies.

COMMISSIONER McALLISTER: Yeah.

MS. BROOK: For the consumer.

COMMISSIONER McALLISTER: It sounds like

that quality kind of control in terms of the product

they give the customer is not really built into the

-- you're kind of relying on the customer to gauge

that, I guess, is what it seems like.

MR. VILLAREAL: So this may not be

addressing your question, okay. But what I can say

is, as it applies to Mark's technical aspect of it,

there is an ongoing effort at UCIG and EPRI and UL

to develop a testing certification program and

process so that any third party can go through this
third party testing certification process, become "certified" as Green Button certified.

COMMISSIONER McALLISTER: Yeah.

MR. VILLAREAL: Which will then alleviate on a case by case basis steps.

COMMISSIONER McALLISTER: Then they could just bring that certification and, bam, they're in.

MR. VILLAREAL: That would be the idea, yes.

COMMISSIONER McALLISTER: Yeah. Okay.

MR. PODORSKY: Oh, I'm sorry, Jan.

MS. BERMAN: I was going to say, one place you might see -- it's not exactly a quality control, but in EENDR the utilities have many partnerships. So you could potentially see a partnership to advance energy efficiency or DR where there's push marketing for some specific vendors that happen to also be Green Button Connect.

COMMISSIONER McALLISTER: Oh, interesting. Okay.

MS. BERMAN: Which is different from a minimum bar for quality.

COMMISSIONER McALLISTER: Okay. Yeah. So that's one of the things we're contemplating in the action plans is that, look, if in order to -- if
this marketplace needs some standardization or at least some minimum bar of quality that gives the marketplace some assurance, then that means that we can kind of be the ones to stamp the availability of a given tool.

And then every utility that has compatibility with it would have to use that, would have to enable that to work with their customers, and that's a system that if it's needed we're certainly open to putting in place.

I'll let other people ask questions if they have them. Anybody else? I guess I'm wondering, so Jan, it's great that you've put together this tool to roll up whole building data and report it up in a portfolio manager.

I'm wondering if Edison has done that or if Jonathan can tell us about any of the POUs who are working on that or have done that.

MR. PODORSKY: That I'm not sure I know, but I think it's great and we can certainly talk more after this, but I don't specifically know the answer to that.

COMMISSIONER McALLISTER: One of the things in 1103 and for other benchmarking tools, but we're really interested not in individual customer data.
We're interested in the whole building data and that tool to roll up and actually, you know, get the buildings matched and then get the whole building information and then put that through a benchmarking process, get the costs down and get the speed up on that would be something that we're pretty much expecting.

MR. PODORSKY: Yeah. I know we support 1003 and I do know we provide files, but I don't know that we're doing kind of a --

COMMISSIONER McALLISTER: Could you put your microphone -- yeah.

MR. PODORSKY: We're going to follow up.

COMMISSIONER McALLISTER: Okay. Great.

Jonathan --

MR. CHANGUS: Yes, this is Jonathan.

COMMISSIONER McALLISTER: Oh, there you go.

MR. CHANGUS: Checking with -- I know that through 1103 and trying to figure out compatibility with Energy Start, Portfolio Manager, there was some output and challenges that we've been trying to work through, and I can get back to you on that with more specifics.

COMMISSIONER McALLISTER: Okay. Great.

Thanks.
MR. CHANGUS: Thank you.

COMMISSIONER McALLISTER: That's obviously going to be important.

MR. CHANGUS: Yeah. I think one of the other kind of related issues, too, that we're still trying to work through and we offered in our comments was if we're seeking consent from customers versus to provide access, that's a really different animal than if we're just, as you said, being asked to provide the customer data in some way, shape or form without the consent, that really changes, I think, the nature of our concern.

If they've approved it then, obviously, a lot of the hurdles or concerns that we have go away. I understand that creates some additional layers of complexity and delay potentially for the market, and perhaps you don't get the full data set.

But I think one of the general comments I wanted to make was, you know, we talk a lot about utility and the market, as well as the, you know, Energy Commission and CPUC needs, but I think we can't underestimate, and I'd be curious to hear a little bit more about, you know, customers' concerns about how their data is (indiscernible) and shared and how we make sure that we're being sensitive to
that so we don't have a fire up there later on that folks did not know or were unaware that their data was going to be used in such ways or put out there. As we've seen, it's been a hot topic in other areas previously.

COMMISSIONER McALLISTER: Yeah, for sure. I mean, I think that conversation is and will be ongoing for -- definitely. And again, I think it has to do with this balance that we've been discussing between -- well, he -- yeah, I won't repeat it all here. Anybody else have any questions?

MS. WADHWA: This is Abhi Wadhwa. I have just one question for the utilities. I understand when we are talking about data we are primarily talking about energy consumption data, but the utilities also collect a lot of characteristic data about the buildings that the customers are occupying, which my understanding is, is some of it is all defined (phonetic) into ratepayer dollars. So as a customer, if I am requesting my data am I privy to accessing back some of this characteristic data or are you constrained in sharing anything outside of the consumption data?

MR. PODORSKY: I would say just from our
perspective, I don't think there's a constraint outside of when I get back to leveraging the platforms we have and the standards that we're using. I would hope that some of those characteristics, if we have them and can share them, that we'd be able to put them in the standard in some way.

In XML, the standard gives you some flexibility because you can just put tags, XML tags to identify what the data item is. So I mean, you know, perhaps there's some leeway there. But again, if it's something specific they're looking for that we're not sharing already, I would hope that we identify it, there's a big enough market need for it so we can actually get it into the standard, because I don't want to vary off the standard, if at all possible.

MS. WADHWA: Just a follow-up question to that. Just roughly, how many data feeds are in the standard right now?

MR. PODORSKY: I don't even -- off the top of my head, I don't know.

MR. VILLAREAL: The technical answer is lots.

(Laughter.)

MR. VILLAREAL: No. So there's plenty --
there's lots of fields in it. There's like address. There's climate zone. There's ZIP Code. There is usages as in kWh, KW therms, whatever you want to think of. There's time period is a -- you know -- 15 minute, one minute, one hour, you know, one year. It is, you know, the 24-hour clock. There's a period for how long -- what the actual time that the period was that you're reporting on. There is lots of fields that, as it was written initially, was done very purposely to identify the world of information that the drafters of the standard thought people would want to know about.

If you would like to see a copy of the standard, you are a government entity so you're allowed to access the standard itself, and you can look through it. As Mark said, it's XML. It's IP based using XML, and the SB is basically the transport for the standard. So I'd be happy to help get you a copy of the standard if you'd like to see it.

MS. WADHWA: And this is the Green Button standard, right?

MR. VILLAREAL: It's the SB.

MS. WADHWA: So it's downloadable from this?
MR. VILLAREAL: A version of it may be available through this, but it is a NAESB standard.

MS. WADHWA: Can you say that again?

COMMISSIONER McALLISTER: NAESB.

MR. VILLAREAL: It is a NAESB standard.

MS. WADHWA: Okay.

MR. VILLAREAL: So the standard development agent off -- organization that houses the data, the standard itself, is the North American Energy Standards Board. So if you were to use it, that's why I would recommend to you, one of these is actually that standard.

There are drafts of it available and there are proposed edits for the next round of it available, I think are public. But the official standard is at NAESB.

MS. WADHWA: Thank you.

MS. BERMAN: We're currently scoping a phase two for the Green Button Connect that would include other data elements. So I'm interested in what people think would be the most useful data elements to include.

We're looking at PII data, gas billing data, every usage, so other characteristics. I mean, I share your perspective that it's really
linking usage data to other types of information that make the data really powerful.

I note that the Energy Data Request Program is pretty open-ended in terms of what kinds of linked data could be obtained. So maybe that's a good opportunity for researchers to take a look at the question of, you know, what linked data together is most valuable and then we could look to further development of Green Button Connect in those directions.

MR. CHANGUS: This is Jonathan again with NCPA. With regard to the question about granular level and building data beyond usage, for the most part that's not information that been collected in the past through energy efficiency programs. However, to go into more custom programs and more deeper energy savings context, we're starting to collect some more of that data. So I'd say it's an emerging area proposed, but very, fairly significant (indiscernible) to the utilities.

COMMISSIONER McALLISTER: Thanks. Okay. So we're at 3:40. I think we need to give our --

MR. VILLAREAL: Commissioner, could I just take one minute?

COMMISSIONER McALLISTER: Yes. Yes, Chris.
Go ahead.

MR. VILLAREAL: When we've talked here about the Green Button, availability of that data, I also want to reemphasize the Home Area Network is also an active option for consumers, predominantly residential consumers who want to get the real time, seven second direct feed off their meter.

The Commission policies on that is the -- as long as it is a ZigBee one net x (phonetic) certified product, the utility is required to attempt to connect that device.

COMMISSIONER McALLISTER: Okay. Great.

Yeah --

MR. VILLAREAL: So that is -- the only bar is that it has to be a ZigBee one net x certified device.

COMMISSIONER McALLISTER: I guess maybe some of might be interested in knowing what "attempt" means, but what's the definition of attempt? I ended up being able to commit my -- you know -- I'm sorry, Jan, I'm a PG&E customer, but so you're the only example I have.

I have a data point of one, but it wasn't easy to get my thermostat connected to the Smart Meter, and maybe that's changed. It's been a little
while, but definitely, I guess that's, you know, if there's a theme it's sort of like, look, let's make this plug and play and ready for prime time and just sort of so that it's part of the ether.

MR. VILLAREAL: And we wanted the market to really develop the products and we did not -- again, we didn't want the utility to be the bottleneck where only utility tested in certified products are the only one that could connect because the software's constantly being updated.

COMMISSIONER McALLISTER: Yeah.

MR. VILLAREAL: So we really wanted the market to try to work its way out to figure out what it wanted to do so that at the end of the day the utility is sitting there with the meter and ZigBee one net X radio, and anything that the market then decides that it wants to do, we can try to work those together.

COMMISSIONER McALLISTER: Yeah.

MR. VILLAREAL: But we did not want to have a limited number of devices out in the market. We wanted to have as many as possible in the market. So I apologize if you had -- you're doing --

COMMISSIONER McALLISTER: Oh, no, that's fine.
MR. VILLAREAL: -- only getting connect.

But it's available out there. Customers can choose to do that of our regulated utilities. So the caller who was in SMUD, I cannot help him address SMUD, but all I can say is that PH&E, Edison San Diego, that is an option for customers.

COMMISSIONER McALLISTER: Yeah. Okay. All right. Got somebody --

MS. BERMAN: I've been in our employee group that volunteers to test the connectivity of new devices. So I've definitely experienced that it wasn't that easy in the early adopter phase. But what we do is we take new devices as they come available and we run them through some processes to try to test out the inner connections.

COMMISSIONER McALLISTER: Right.

MS. BERMAN: And work the bugs out.

COMMISSIONER McALLISTER: Thanks. Thanks for everybody on the panel. Appreciate it. All right. So we're going to go -- let's see, we're going to go to Robin Mitchell, right?

MS. MITCHELL: Okay. Yes. So this is Robin Mitchell and I work at Lawrence Berkeley National Laboratory. Can you hear me okay?

COMMISSIONER McALLISTER: Yeah, we can.
Thanks. Thanks for being here.

MS. MITCHELL: And so yeah, I'm sorry I couldn't attend in person, but there's too much going on. So I'm going to talk about BEDES and SEED. Next slide. And then first I'm going to talk about BEDES which has been -- I think both of them have been referenced in various contexts in this day Workshop.

So next slide, please. So what BEDES is, is it's a Building Energy Data Exchange Specification. So basically, it's data terms, definitions, field formats that software tools can use and other, you know, data schemes, databases that are in the building energy performance environments can use in order to try to standardize what the terms are that everyone's using.

Next slide. And so the problem is that there's a lot of data out there, a lot of different databases, as we've been talking about today. And because they are slightly different from each other there's a lot of cost when people try to combine the data or share the data, aggregate it, that kind of thing, and this prevents more analysis being done, as been discussed today.

And so the solution is to have some common
terms and definitions for these data formats in order to reduce the cost of looking at that data across different data sets. Next slide. And so the Department of Energy started this project called BEDES and the first use cases that we were looking at were building performance tracking.

So that's the benchmarking policies that different cities and entities are implementing. Then also, the energy efficiency investment decision-making. So this is maybe more on individual buildings, maybe building owners across portfolios, that sort of thing.

And then energy efficiency program implementation evaluations, so larger programs that utilities or other organizations might be putting together.

Next slide. And so BEDES originally started because DOE has several energy efficiency software programs, none of which have the same definitions for the same field content. And so internally, they worked to develop standard data formats across their different platforms, and they did a scoping study asking people out in the world if this kind of thing would be useful to other stakeholders besides DOE.
And the scoping study said yes, that would be useful. And so LBL worked last year with a technical working group composed of software developers, program implementers, people -- consultants -- people that work with data, this kind of data, to develop this BEDES format, definition, whatever. And after nine months of review and lots of workshops we released 1.0 in October of 2014.

So next slide. And so what BEDES is, is it's actually a dictionary. So it has data terms and the definitions of those terms, associated units of measure, data types. It's really just a dictionary, and what it is not is a database format or a schema that has hierarchical relationships.

And we had a lot of discussion about this in these working groups and the software developers that were in those working groups did not want to be told how to put these different terms together, because for different use cases you might set up your hierarchies differently.

And so we decided that really the thing that made the most sense is just a dictionary with terms and definitions that everybody agrees on, that that's what, you know, a term means. Next slide.

So we just released on Monday Version 1.1 of BEDES
and it's -- we basically released it on a website.

So BEDES.lbl.gov, and so part of the website has this online dictionary. So it has all the terms and definitions in a searchable database on the web, and you can sort by -- or you know, filter by different categories, envelope, HVAC, that kind of thing.

And again, that doesn't represent the hierarchy. It's just a way of categorizing the different terms, and it doesn't really mean anything. It's just grouping. And so you can search through the database or through the dictionary and see what the different terms are that we have included in it.

Next slide. So and the way that we envision that BEDES would be used is, so it's basically sort of for a machine to machine data exchange. And so what would happen and what has already started to happen is that different software developers would make a mapping between their internal field names and the BEDES terms.

And so because we sort of disaggregated a lot of the terms and definitions, and again, that was based on a lot of back and forth with the working group, that we decided that more granular
was better, and then the terms can be built up to
make, you know, a field name that you would actually
want to use in your software.

So the idea is that the software developers
wouldn't change their internal terms or field names
or anything like that, but they would generate these
mappings so that someone would know if they looked
at this mapping what the BEDES terms are that are
associated with internal field names.

Next slide. So there's a couple different
ways that an application might use BEDES. So in
some cases on the left-hand side, maybe an
application is fully defined within the terms that
are in the BEDES dictionary, which is fine.

But in a lot of cases the application might
use some of the terms in the BEDES dictionary, but
it might have a bigger scope, and so there would
definitely be terms outside, field names and such
data that they would collect would be outside the
scope of the BEDES sharing, and that's fine, too.

Next. So in order for an application or
even, you know, it's not just software applications,
although that's mostly how it's being used. The way
you would say that your BEDES compliant, there's a
couple different options.
You can say that you have mapping compliance, which means that you've just developed and published, hopefully on this website that we're in the process of putting together, the mapping between your application and field names and the BEDES terms.

And then the next level of BEDES compliance would be that you've actually, from your software, you have an export file that is actually completely BEDES compliant, that it actually has field names that match the BEDES terms.

And so that's kind of the next level, is different pieces of software actually export, and you can have your own export, you know, that you use for other things with your own field names, but then if you would specifically have a BEDES compliant export that would have the field names in the BEDES terms, and then when multiple, different vendors produce these kinds of exports, then hopefully, it's easier to pull the data together, to merge the data and know that the terms all mean the same thing.

Next slide. And so on this website we have a bit of information about who's doing these mappings and adopting BEDES. And so in the middle where on the right-hand side, compliance product, it
says -- or compliance product, it says "available."

So those are basically the DOE tools. So they're actually BEDES compliant and they aren't necessarily by default BEDES compliant, because we did, you know, make some changes and additions. So we have had to do a little bit of work to make them compliant, so the Building Performance Database, Building Sync and SEED are all BEDES compliant at this point.

Then Portfolio Manager is in the process of doing a mapping. We're actually helping them. We're doing it for them. We're making a mapping for them to Portfolio Manager. And then the RESO Data Dictionary, that's the Real Estate Standards Organization, they're very interested in getting energy efficiency information into their real estate world, and so we're helping them do a mapping to BEDES.

And then the Energy Commission's STD Data Dictionary is also being mapped to BEDES. And then there's the ones at the top, a lot of different formats are being planned to be made -- you know -- mappings generated for BEDES, to show BEDES compliance.

Next slide. And so there's a couple
different ways that, you know, BEDES could be used. So for example, if Portfolio Manager, it has its own field definitions. We're not proposing they change any of that stuff. They do their standard export with their own format.

And then there's some sort of translator that could take many different forms that using the BEDES portfolio mapping specification, it translates the sort of native Portfolio Manager export file format into a BEDES compliant format, which then could be used for other applications. And this is exactly what we've done for SEED, is that we have built this little translator inside SEED to take the Portfolio Manager data that comes in, in its native form and we put it into a BEDES compliant form inside SEED.

And then on the bottom, the audit data tool, this is an example where maybe, for example, Building SYNC, which is an audit schema, basically, and it was developed at the same time BEDES was. So it is BEDES compliant sort of by default.

All its internal field names and everything are BEDES compliant. So there's no need for a translator. It just has BEDES compliant information and data sets, and so it doesn't need a translator.
and it can be just used with other applications.

So next slide. And so if you're interested in BEDES, definitely get in touch. If you're interested in developing a BEDES compliant product we can help you do the mappings. It's a little tricky, and so we're definitely, you know, helping lots of people do their mappings, because you sort of have to know how the BEDES world is put together in order to construct your multiple term definitions that work with the existing field names that you have.

And if you're already using BEDES and we don't know about it, we'd like to know about it. We can put information up on our website about who all is using BEDES. We also have a BEDES working group forum where you can comment on topics that come up and you can introduce new topics, and we're always interested in developing additional terms and definitions for new areas that are, you know, relevant to energy efficiency, but that -- and that's part of what happens on the forum, is that people introduce new topics about terms that they think should be added.

So I'm going to -- this is it for the BEDES part of my presentation. I don't know if you want
to take questions now about BEDES or if I should just move right on into SEED.

COMMISSIONER McALLISTER: Why don't you just move on into SEED.

MS. MITCHELL: Keep going? Okay.

COMMISSIONER McALLISTER: Yeah.

MS. MITCHELL: So next slide. So now, I'm going to talk about SEED, which is an actual software -- yeah, you can go to the next slide -- software program, platform, and it was developed by the Department of Energy, LBL and Institute for Market Transformation.

Next slide. And so SEED was primarily developed in order to help cities and counties, states, whatever entities that are trying to do different kinds of energy efficiency programs. It's basically a data management tool in order to get data into a form that people can use to evaluate the energy efficiency state of their city or whatever they're trying to analyze.

So next slide. So and again, the idea is to try to make all this data and the systems that use them interoperable. So SEED is being developed as an Open Source Project, and it's basically web-enabled software, again, to allow people, whoever
wants to use it, to import data, perform data quality cleaning on it, track what's going on in their different buildings, and then potentially share the data and even make it public, because some of the benchmarking legislation requires that they make at least some of it public.

And the idea is to reduce the cost of, you know, dealing with all this data, as y'all have been talking about all day, and trying to get good quality data and having a common format so that it can be shared across different platforms.

Next slide. So we started our first use case that we've really been concentrating on in the first phase of development is benchmarking, because there's a lot of cities around the country that are doing benchmarking, and it's a significant amount of data crunching that they need to do.

And so that was our first use case, and I put Berkeley on there because they just passed the benchmarking policy I think last week or something. So next slide. And here's just an example of Seattle's benchmarking data, and they've been doing benchmarking for quite a while.

They actually implemented their own system in order to manage all the data. And so this just
shows, you know, by building type what the site EUI is for these different building types, and what the range is across -- even within a building type what the range is.

And so it just starts to give you a sense when you do this kind of analysis of where you should target some of your energy efficiency programs, what kind of buildings to target, that kind of thing.

Next slide. And so you can use benchmarking as kind of a foundation for all the other energy efficiency programs that you might want to implement. So it's a good place to start.

Next slide. And so what the cities are faced with is that they have a lot of different sources of data and they need to somehow figure out how to pull it all together.

Next slide. Next slide. Go back one.

Yeah. So what they've been doing in the past, the cities that are doing the benchmarking, is that they've been using spreadsheets to collect all this data and put it all together.

And that works as long as you're only dealing with maybe one or 200 records, but as soon as you start to be dealing with 1,000 or tens of
thousands of records, the spreadsheet just doesn't - it just isn't possible to deal with it in a spreadsheet form.

Next slide. So what SEED is, is it's basically a database, so that little cloud in the middle represents the database that all this data stored in. And so for example, of a city that's trying to do benchmarking, on the upper left they have their tax records. So that's from their tax assessor.

So maybe they have to benchmark -- building owners have to benchmark buildings that are 50,000 square feet or great, commercial buildings. So they pull that information from the -- the city pulls that information from their tax records, and so that's their basic starting point. This is their list of buildings that need to be benchmarked.

So that gets imported into SEED, and then the owners are required to input their information to Portfolio Manager, and I think almost all the benchmarking programs that I know about use Portfolio Manager as the platform to do the basic benchmarking.

So the owners get their information into Portfolio Manager. So now, they have energy
information, as well as some other kinds of
information in Portfolio Manager, and then the city
-- and that data is shared by the owners with the
city, and then the city can sort of bulk load that
into SEED.

So now, you have two data sets. You have
the tax records and you have Portfolio Manager data
that has to be mapped. They have to be matched
together so that you know which Portfolio Manager
data goes with which tax record building.
And that's what SEED. That's one of the
main components that it does in terms of data
management, is just matching all these records
together. So that's the use case that we're
currently that currently we have in the program.

The other thing that people are very
interested in doing is adding audit data through
different audit tools, and so we're working on
incorporating that this summer. And that's probably
going to be in an HPXML.
We're basically going to be able to import
HPXML files from the commercial asset score tool,
and so that will give us the functionality to have
HPXML, you know, as an import file format into SEED.
And so if you have the audit data and you have your Portfolio Manager data and your tax assessor data, it all gets matched by some identifying field in there.

Usually, it's address, but it could be other things, and then you get a building record for each one of these associations. So then you have your core database, and the idea behind SEED is that all the way that it functions is through API calls, and that means that other pieces of software can be written to do those same calls to a SEED database.

So then you can get third party applications written and various plugins. So then you start to get, you know, third party developers working on plugins and apps for SEED that they could actually, potentially make a business around, so that SEED itself is the Open Source platform and different people can contribute it, and DOE is supporting some of the funding of it and it's kind of the core data management tool, but then a lot of the fancy stuff, like all the visualization and stuff would happen from outside vendors that would hopefully be able to make a business case about generating those things.

So once you get the data into SEED, the
little red box on the right-hand side, the city can, you know, with their organization they can get to it. They can go through and say, oh, this -- you know -- this building didn't actually get their Energy Star score; we'll get in touch with them and see if we can get them to fix their data.

So there's some data cleansing that could happen that way. Then they can actually, you know, if they had an IT department or they could hire somebody that wanted to add some extra applications or functionality onto the program because it's Open Source, they can just do that.

The data can be then exported to the DOE building's performance database, which is anonymized data, but it is publicly accessible so the people can see what the energy consumption is for different building types and that kind of thing.

So that's sort of the basic structure of how SEED works, pulling in data from different sources, matching the records together, and then different applications can access that data and it can be put out into the public sphere, whatever pieces of it that you want put out there.

Next slide. And so this is just an example of some apps that the third party vendors could
potentially make. So there's a lot of interest in having, you know, like a Google map application where you actually have little markers for all the buildings that were benchmarked.

And some cities are already -- you know -- they've kind of already done that with their own internal data, but this is the kind of things that a third party developer could make that cities might want to purchase.

And then heat maps of, you know, how the different buildings are consuming energy across the city. You could do mobile apps, lots of things that people have talked about. And so SEED just provides a data source for all these different applications to be built on.

Next slide. And so we have SEED 1.1, well, in the public repository and also LBL has an instance of it running on the Amazon Cloud. And so we have the basic data matching functionality in there. We have exporting capabilities and then it's on -- platform architecture is that it can be hosted in the Cloud or on local servers.

Like some cities don't want to do it in the Cloud. They want to have it just on their local servers. Some of the bigger cities that have IT
departments, they'll just put it on their local servers.

And the idea, also, is that we're trying to encourage third party hosters to have instances that the cities could then -- you know -- that the third party hosters would support and the cities would pay a small fee to have their applications hosted there.

And again, you know, Open Source software with lots of opportunities for third party software extensions. And we do have -- we've built in multiple levels of user access and control so that not everybody can see everything.

Next slide. And so in terms of our core use case being benchmarking right now, we're working with five pilot cities that already have benchmarking. They've been doing benchmarking for a while. They've been doing it for two or three years at least.

So they have their system in place. And so we're kind of -- they're testing SEED in parallel with their existing system so that we can make sure that SEED does everything that they need to have done, so that then next year they can transition over to doing SEED exclusively.

And then there's a lot of interest in other
use cases, the audits they had already talked about. There's been several people interested in interval data, Matt being one of them, and but he's not the only one.

There's a couple other people that are interested in trying to figure out how to use SEED for interval data. And then there's a lot of interest in the real estate community that, you know, they want to get, like, the Energy Star score of a building into the MLS, that kind of thing, which they could do through SEED.

And then there's, even without us really going after third party developers, a lot of people have started looking at the code and trying to figure out how they might use it for their own application, whether they would put some of their changes back into the public Open Source version, and most of what they are doing, again, is the cool visualization stuff. That's what everybody's interested in.

And someone had a question of scalability, and there aren't real technical barriers for scalability and the only thing that someone brought up here was just, if you have a lot of data and it's very bad data, it'll just be hard, you know, to get
it into good quality data, but that's part of what we hope that SEED will help with.

Next slide. And so this is just the login page of SEED. So on the left-hand side it's kind of small, but where it says "data," that's where you would import your data, and then once the data's in it makes a set of buildings, and then under projects you can filter the data and get out the records that you want to do an export to or whatever.

Next slide. And so if anybody -- because we do have this instance of SEED, we've put up an instance of SEED on the Amazon web. Anyone that wants to try it out, you know, I'm happy to set up an account for you.

I can go through a little webinar about how to use it, sort of visit little test beds and you can see, you know, if you think that it would be something that would be useful for you. And we've been talking to the CEC about using SEED for potentially the 1103 benchmarking compliance, and then also, the -- what is that that's the Prop 39, I guess, for the schools.

So you know, it's not clear whether SEED is the right fit for those things, but we're definitely having that discussion. So and that's all I have
for this presentation.

COMMISSIONER McALLISTER: Great. Thanks very much. That's super helpful.

MS. MITCHELL: Um-hum.

COMMISSIONER McALLISTER: I really appreciate your being there. Can you be with us for a couple minutes?

MS. MITCHELL: Yeah, yes.

COMMISSIONER McALLISTER: You have a 4:00 o'clock, I think, but anyway.

MS. MITCHELL: Yeah, that's okay, but I told them to start without me.

COMMISSIONER McALLISTER: Okay.

MS. MITCHELL: It's the SEED developers and I just have to make sure that they do what they're supposed to do.

COMMISSIONER McALLISTER: Oh, they can wait.

(Laughter.)

MS. MITCHELL: Yeah.

COMMISSIONER McALLISTER: So let's see. Does staff have any questions? Are there any questions in the audience for Robin while we've got her here?

MS. WADHWA: I have a burning question,
which I believe I've asked before. And for some reason I keep getting confused myself every time I see a SEED presentation, Robin, I just want to put you on the record here.

Does SEED or does it not actually host the data that it takes into its own server? Or are the servers in different places and the data still rests there and SEED is basically just doing a relational poll?

MS. MITCHELL: No. There's a database that's part of the SEED platform. It's a postscript (phonetic) database and when you install an instance of SEED on a server you get the database installed also, and then whatever data's imported is stored in that database.

MS. WADHWAA: So who's hosting that server?

MS. MITCHELL: It depends. It can be anybody. So you know, right now we have a version of SEED up on the Amazon Cloud, so we're being hosted by Amazon. But others, like I think New York City and L.A. is actually -- I think L.A. County has a version of SEED that they are doing internally on their own servers.

And then there's this option of third party hosting that some cities might want to do, some of
the smaller cities that, you know, can't afford to
do their own instance. They would have an account
on a third party hosting -- host provider.

COMMISSIONER McALLISTER: Can I just --

MS. MITCHELL: So it can take lots of
different forms.

COMMISSIONER McALLISTER: Can I ask a
follow-up on that? So if, for example, L.A. County
has an instance and they have their own local
benchmarking program that they're using it for, and
then the state has a benchmarking program that is,
you know, similar in most ways, but isn't
necessarily identical to that local program, and we
each have an instance of SEED, how do -- can those
two instances communicate and that one and others
possibly roll up into the state one, or is there
some trick to doing that or is that not possible or
what?

MS. MITCHELL: Well, that functionality
doesn't exist now, but a lot of people have been
interested in it. And again, you know, it's Open
Source software. So if somebody wanted -- like if
L.A. County wanted to develop some code that would
do the roll up that could send to the state's
version of it, they could do that.
You could pay for somebody to, you know, develop that, maybe DOE if they thought that it was -- DOE funds stuff that they think, you know, is useful to the larger audience. So it just sort of depends. But that's the beauty of the open sourceness of the -- you know -- the Open Source software, is that lots of people can develop on it. And you know, the hope, especially for public agencies, is that they do something really useful that they would put it back into the Open Source so that everyone could benefit from it. But you know, it's not required or anything.

COMMISSIONER McALLISTER: Right. Thanks.

MS. MITCHELL: Yes.

COMMISSIONER McALLISTER: I'm really just want to congratulate you. Every time I hear about SEED or interact with DOE folks for sure, and then I know you guys are leading the charge for DOE, I want to -- you know -- I say thank you for taking this on, because I think it's really got a lot of public benefit attached to it.

MS. MITCHELL: Yeah, and we're just in the sort of infant stages now, and I think, you know, it has a lot of potential, and especially if we get a community of developers. One of the things that
we've done is that DOE has given money to hire five private software developers to, you know, do some of the -- add some of the functionality. Like we want to have an automatic connection to Portfolio Manager and that kind of thing. And so really, I mean, it's yes, to get some more features into the program, but the other aspect of it is that we want to get more people, more external developers understanding the code so that, you know, they can be hired by other entities to do work on the software, and basically, just to create a community of people that know the code and can work on it.

COMMISSIONER McALLISTER: Okay. Well, thanks very much.

MS. MITCHELL: Sure.

COMMISSIONER McALLISTER: It doesn't look like we have any other questions. We really appreciate it.

MS. MITCHELL: Okay. Great. Thanks.


MS. MITCHELL: Um-hum.

COMMISSIONER McALLISTER: So Martha, I guess, Martha, are you up next?
MS. BROOK: Okay. So this part of the Agenda really all afternoon is supposed to be kind of transitioning from consumer market facing needs for data to government needs for data. So for policy planning, policy implementation, policy tracking, and so we just have this one slide explaining sort of the State Government, what we think we need to establish a baseline so that we can measure the progress on our 758 existing building strategies.

So when we say granular baseline data we basically mean building energy use data by fuel type, by building or business type, by building size, by building age, by building location, so that some of the things, basically the other things we were talking about today, this could be very similar I think to what I heard about the data decision in terms of those groupings.

But we really don't want aggregate data. We want distribution so we can understand means, median, standard deviations. So we really are looking at population statistics, and you know, I think in the past we've used statistical samples to get at some of this data.

But then we struggled to keep those samples
up to date, and in fact, you know, we have failed miserably at keeping those samples up to date, I would say, as not just Energy Commission, but everyone involved in building characteristics, data collection, we don't keep those data sources up to date and that's very problematic to all of us.

So that's what we mean by granular baseline data, population statistics that we can use to track at a policy level impacts and progress on our goals. And we also need to map this data to demographic information so that we can understand natural trends.

And are we going to get there anyway regardless of lots of program activity? We don't think so, but we need to understand not just energy use, but how it relates to the demographics of the building occupants and owners.

And for any of you who have been thinking about this, you'll see lots of overlap with the same data that you need for long-term demand forecasting, and we acknowledge that, we agree and we're going to be working with our data forecasting group to collaborate on data collection needs for this type of data. And that's all I have. I think we can move onto our next speaker.
MS. RAiTT: Next speaker is Ronald Mohr.

MR. MOHR: Really quick. The middle one?

Okay. Good afternoon. My name's Ronald Mohr. I work with the County of Los Angeles. I'm with the Office of Sustainability. I'm a Section Manager there.

The county, we've been in data and efforts and bill stuff and all for a long time. I've spent about the last 15 years of my life on it. Right now, under the umbrella of our Southern California REN activities we have two big data efforts going on right now.

One of them is what we call the Energy Atlas, which is being done with PUC funding that we manage, UCLA. We've also, then, we're going to regionally host a SEED instance from the DOE tools that we just heard about.

We're hoping to match them up with some building analysis tools, such as the asset scoring and some auditing schemas once they get built.

We've also internally over the last four years, we're collecting monthly utility bill data for around 55 municipalities throughout Southern California.

We have roughly over a little over 15,000
service accounts for those cities. It's not really done underneath the REN. We've kind of been stopped right now because we can't get additional data. The energy outlet itself, though, is what I'm here to talk about today.

It's a reporting platform that combines all sorts of different stuff. It combines GIS, energy, greenhouse gas, economic, population, climatological. It collects data from a bunch of different sources and then they start analyzing it. And they can slice and dice data a whole bunch of different ways. Because of the confidentiality rules some of the data that they're looking at and that the UCLA staff knows about, we're not going to be able to publish.

But UCLA has just flat out said, if people were looking at the data that they were looking at our EE programs would be significantly different. There's a very, very small group of extremely high users, especially in natural gas and water, and they say programs would be vastly different if that type of data was looked at.

COMMISSIONER McALLISTER: Ron, would you kind of maybe back us out or back us up and talk about where maybe the various sources of data, in
particular the energy data, and sort of how that
play by play has gone?

MR. MOHR: It's actually, I believe, on the
next slide.

COMMISSIONER MCALLISTER: Oh, great. Yes.

Sorry. I'm jumping the gun.

MR. MOHR: Yeah, it's okay. I'll talk
about it anyway. I can go all over the place. The
original UCLA effort just started with UCLA and Los
Angeles -- not Los Angeles -- and the City of Los
Angeles and Department of Water and Power. UCLA
approached them, asked for some data.

Department of Water, Power, surprisingly
enough, supplied data and supplied it accurately and
fairly fastly, which was -- if you Department of
Water and Power, it's kind of surprising. And they
started doing some analysis on it and it greatly fed
into the City of Los Angeles' ordinances for the
benchmarking, reporting and things like that, that
are coming down the road within Los Angeles.

So once they got that, UCLA approach the
PUC. The PUC had collected data from the IOUs
themselves and the PUC handed off data to the
utilities and that's how they got it. I think the
data set that we're working on right now was from
2010.

So every day it turns a little bit more vinegary on us, but it's providing information to us and we're just about to go public. I think the website and all the development's just about done, and then we're supposed to have a back hackathon on security where they bring in their experts and they try to break into it and do stuff and see if they can dis-aggregate it and identify customers and all that.

But that was the roadmap, though, for UCLA and where they got it. It was fairly -- I don't want to say easy, but as far as the handoff of the data and all, it went fairly well on the energy data. The energy data was pretty much straightforward.

Some of the other stuff, then, with identifying where the accounts were and things like that, addresses, parcels, that gets a little bit more difficult because the parcel data, for instance, and the address data, it's not necessarily how the utilities serve on buildings and all. It ends up from some other analysis and some things that we're doing on the SEED platform and the reporting, at least in Los Angeles County
right now, we found out, for instance, that every
building does have a unique building number in the
county.

One of the gentlemen mentioned that this
morning about, do buildings have IDs. Yes, they do.
It's part of our GIS Effort in the county, and all
the cities in the county are in the GIS Effort. So
we do actually have a building tracking number in
the county that we're going to incorporate it within
our SEED activities.

COMMISSIONER McALLISTER: There been any
discussion about -- so you said you have a static
data set from 2010. Is there any discussion about,
you know, doing an annual refresh or sort of setting
up those -- that infrastructure --

MR. MOHR: I believe --

COMMISSIONER McALLISTER: -- to keep it
update?

MR. MOHR: -- I want to be like 99 percent
sure that we're supposed to.

COMMISSIONER McALLISTER: Um-hum.

MR. MOHR: And I think it's on a schedule.
I don't want to swear to it. I can't absolutely
swear to it, but I'm 99 percent positive, because
we've already talked about that. There is a roadmap
for future development, what we want to do.

It is based on some funding. The funding and the grant money has to come in. The county's not funding this out of their own pocket and neither is UCLA. So there's got to be a funding source somewhere.

So the ultimate goal of that energy outlet is to influence policy, one way or another, whether it's governmental policy, tariff policy, grid reliability. There's going to be a lot of social justice things that show up as a result of thing.

Besides just the straight up energy consumption, we've talked about looking at transmission and distribution grids and things like that, and where the transmission lines are, what communities they roll through.

There's a lot of that stuff. The amount of energy used by the upper income socioeconomically is huge, and a very, very small percentage of income.

Lower income socios got a very, very small energy usage, but a really, really high percentage of income.

Some of the stuff when they start looking at things like that demographically, I don't know much about the social justice world, but it's going
to put stuff right out there in the forefront. It's going to be there.

I'm not an expert in this, but when I start to see stuff, even I kind of get interested into it, you know, and this is not my background at all. But they make it easily explainable. So we're hoping to drive local codes, though.

I mean, as far as the government agencies and the SoCal REN, it's hoping to develop policies within our communities that make our communities better in the long run. That atlas work that has taken place, the development of the effort right now in the City of Los Angeles under Mayor Garcetti, when UCLA went out there to talk to the city and some of the City Council, deputies and the chief deputies and all, they were somewhat resistant to the effort and they started quoting all kinds of numbers on energy usage in their city and what was going on.

And the UCLA folks literally smiled at them and said, yeah, all those numbers you're quoting, that all came from us. That's our analysis of DWP data. That's not DWP analysis of DWP data, and that's how they got buy in, and it really happened in one meeting.
So here's just some of the samples results, for instance, that have showed up within the City of Los Angeles. Greenhouse gas emissions, roughly 51 percent of those are coming from our building stock. Here's where we get into some of those numbers that are kind of shocking.

This one kind of knocked me off my seat. Fifty percent of energy consumed by the local building stock came from just four percent of the buildings. On natural gas and water, it's even smaller percentage.

So when they start rolling up that data they can, within the outlets, they can roll it up by neighborhood, by city, by cog, by county level. You can just start slicing and dicing stuff every which way you want.

Our next goal on our atlas is we want to take our atlas, and the county's been operating the solar map for about eight years now. I think we're on our second version, about to go to our third. We want to combine our atlas and our solar map.

Somebody this morning mentioned matching up where the load is, where we need that generation, what the potential is there. One our solar for instance right now, all of our solar map is actually
based on rooftop solar.

Our next version we're also going to go for parking lot solar and canopies, because that's what the vendors want to do now. Hoping that we start that within maybe the next year and a half, but that's one of our next goals on our atlas.

So here was that history that you asked about. It's like by UCLA. Originally, the city, PUC provided the IOU data and right now, we're funded off the PUC grant funding. So we've got the funding right now through the end of this year.

Then we see what happens.

These are other efforts under the SoCal REN. We've installed and got a SEED instance going within the county's data center in Downey. We're hoping to offer it to any governments within the State of California that want to use it.

Right now, we've got the city of Los Angeles on board and that's the big one. City of Los Angeles has roughly 100,000 parcels that are classified as commercial parcels. We believe, based on a cutoff of round 7500 feet per parcel, we have over 35,000 parcels that are going to be in our targeted reporting group for -- those are commercial parcels.
So City of Los Angeles is significantly big. The other people around, I'm not trying to knock on anybody, but the other people around the nation who've done stuff, they're fairly small compared to us, except the City of New York. The City of New York, 20,000 parcels. They had an 85 percent compliance rate within two years. They absolutely hit a home run. They went through a little pain to get there, took them about three tries, but the City of New York is definitely the standard to follow. They got it done.

Right now, then, the next thing that we want to do is, because it doesn't exist, it's actually the one at the bottom. Right now, there's a schema out there for doing the energy auditing. They refer to it in our last phone call called Building SYNC.

There's not really a product out there that's been built on it that's in the public domain yet. We're hoping the DOE builds one. There's a group out of Texas, Texas wants to develop statewide reporting, statewide benchmarking, statewide auditing.

There's a group led out of University of Houston or one of the institutions in Houston that
are working on a product right now that will
happily be in the public domain. If it becomes
available we're going to kind of follow that lead.

Then that'll tie into the energy asset
scoring, and we have the local database, then, in
Los Angeles for whoever wants to use it. Those DOE
tools are going to enable us in the administration,
benchmarking, auditing and reporting.

We are already hosting, like I said, and
we're in a collaborative partnership right now on
the DOE Building SYNC tools and to develop some
other capabilities with some parties out of New
York, and then working with Texas.

This is me. I'm available anytime. You
can call that number. I'll talk whenever you want
to talk. We want questions now or are we --

COMMISSIONER McALLISTER: Thanks for being
here. This is great. And we really -- it's great
to see L.A. just leading the pack on so many
different fronts, and congratulations on that, L.A.
County and City, really.

The gentleman from Berkeley this morning,
the first speaker of the day that talked about some
stuff that's needed and why it's needed, it's like
he's sitting in our conference room.
COMMISSIONER McALLISTER: Um-hum.

MR. MOHR: Those are our conversations that have been taking place for about the last six months. So we sit around, talked about doing this.

MS. BROOK: Great.

COMMISSIONER McALLISTER: All right.

Thanks very much. Anybody have any questions for Ron?

MR. MOHR: Anybody want to share a cab to the airport?

MALE SPEAKER: That's where we're going.

MS. BROOKS: Thanks, Ron.

COMMISSIONER McALLISTER: Great. All right. And last but not --

MS. RAITT: Next.

COMMISSIONER McALLISTER: Or let's see. Seems like Kevin needs to leave. So he wants to ask a question.

MS. RAITT: Okay. So --

MR. MESSNER: Thank you. Yes, thank you. I just wanted to -- I didn't know what the right spot is, but this is Kevin Messner. I represent the Association of Home Appliance Manufacturers. And just as you talked about DOE and databases, on the Appliance Database that CEC does, and I don't know
where it exactly fits into this, but there's a
Appliance Database at CEC.

There's an Energy Star database. There's a
dOE database. There's an FTC database. And if
anyone takes the time, which we have, to compare all
the databases that everyone's using to feed into a
lot of these others for information, you'll get
different results because every database has
different requirements, different fields.

So I think, and I've talked about this
before and I think CEC seems to be -- recognize this
or open to this, and that's to -- we should try to
consolidate these, all these databases into one,
whether it's DOE and CEC joint database or whatever
it is.

But I just wanted to add that to the mix of
today's discussion because it really would help from
a manufacturing company's perspective where there's
folks that are having to spend an exorbitant amount
of time sending data in to all different places with
different criteria.

So and then when people use it, if they use
one database they come up with, hey, here's the
results and a different one will get you different
results. So just wanted to bring that on the table
and we'd love to work with you guys and DOE and whoever we need to, to try to help with the appliance information that's out there. So thank you.

COMMISSIONER McALLISTER: Thanks, and probably Peter Strait is the most relevant staffer for you to talk to. He's not in the room right now, and really, there's going to be kind of a -- well, probably from our perspective it's really more of an inoperability thing rather than a consolidation thing, but you know, that's -- you know -- we can have that conversation.

MR. MESSNER: Okay.

COMMISSIONER McALLISTER: But certainly, having them, having as many of these databases talk to each other as possible, not that it would get you out of reporting on each one of them necessarily, but in any case. We did actually mention that, something along those lines in the action plan, so.

MR. MESSNER: Oh, okay. Good. Good. Yeah, and just even in the reporting it the same way with the same fields or some kind of thing would be great.

MS. BROOK: Okay.

MR. MESSNER: So thank you. Thank you.
COMMISSIONER McALLISTER: Thanks.

MS. BROOK: Hey, can we get Barry Hooper to present before we open up?

COMMISSIONER McALLISTER: Yes. Yes, absolutely.

MS. BROOK: That'd be great.

COMMISSIONER McALLISTER: I just -- Kevin seemed like he really needed to get that off his chest. Sorry, Barry.

MS. BROOK: No, that's fine. I just was worried that --

MR. HOOPER: Good afternoon. I'm Barry Hooper. I work for the City and County of San Francisco, and today I'm also representing Green Cities California, which is an organization of progressive cities across the state focused on environmental policy in general, topics as diverse as bio-diversity, water efficiency and energy efficiency.

So I'll have -- but I was also asked to comment about some things that have been very directly relevant to the thread of the conversation today. So in terms of Green Cities California's comments regarding the Draft Action Plan, it's really just some quick words of strong support,
recognizing the action plans aim for expanding and
supporting benchmarking, particularly for multi-
family, which hasn't been done by any organization
yet in California at this scale that's being
contemplated.

It's a real cornerstone of affect because
you're making it for both local government and the
state and we're really encouraged by that effort.
Second, the Green Cities comments encouraged,
really, even aiming for more aggressive time lines
for benchmarking state and local facilities, if
possible, and also aiming for a demonstration of
energy savings before 2020.

And that was kind of a bit of a recurring
theme for several specific elements of the comments.
Again, I'm just kind of -- they have been submitted
in writing. So we have those available to you. But
one other idea that came up was a request in that if
-- as the statewide Public Disclosure Program and
Benchmarking Disclosure Program is implemented, the
ability to share that with local governments would
be another option for providing some efficiency for
administration of -- and informing local policies.

Last, in the section discussing asset
scores a suggestion was to potentially use the MLS
databases throughout the state as another
communication medium for accelerating discussion and
use of the asset score.

COMMISSIONER McALLISTER: Have you found or
have the members found that the MLSs are kind of
amendable to incorporating this in them, or do you
think it would require some sort of, you know, top
down initiative?

MR. HOOPER: Taking off my hat as the Green
cities california presenter today, my experience is
no. I mean, so the san francisco association of
realtors has been -- was very supportive and was the
first association of realtors in california to
include energy star label, a hr score, lead
certification green point rated in their database,
that was really driven by a few individuals and
definitely not by the city itself.

And it wasn't, unfortunately, backed by a
commitment to obtain that data and it was done so
early that the quantity of data available wasn't
really relevant to the market. You know, when
there's one green point rated home on the market it
doesn't drive your purchase decision.

But that did lead to a lot of discussion
and some great work led by built it green in the bay
Area, bringing together the various MLS providers and really recognizing that they are -- it's a little bit like how water utilities are managed differently than energy. They're balkanized and fundamentally they're to serve the realtors. That said, you know, a statewide push and an effort to improve information transparency, and that's really what the MLS is about, if this information's available, portable, structured, I'd be shocked that MLSs would refused to carry it. It's more the getting the infrastructure up and ready to do it.

COMMISSIONER McALLISTER: Thanks.

MR. HOOPER: And then the cities really love the idea of the competition and local government challenge as a means of motivating progressive cities to move faster and father and demonstrate success. So for more information, I refer you to the Green Cities California website.

And then I had a number of slide that I'm going to skip because Robin covered the DOE system in great detail and did a fantastic job. Pardon?

(Laughter.)

COMMISSIONER McALLISTER: Somebody needs to mute their phone on the other end there.
COMMISSIONER McALLISTER: Hey, Charlie, could you mute your phone, please?

(Laughter.)

MR. HOOPER: The following does not necessarily represent the opinions of Green Cities California. San Francisco, as you know, operated a benchmarking ordinance that went into effect in 2011, same year as New York and Seattle, and has been requiring annual benchmarking, as well as a mandatory audit or retro commissioning for nonresidential buildings of 10,000 square feet or larger, all very much in line with the ideas in the Action Plan.

The actual use of that information is voluntary and so we're really encouraged by a lot of the innovation discussed today, including and particularly open EE Meter, as mechanisms of improving the ability to put that information into action and encourage improvement.

A little bit similar to the statewide issue or probably any geographic area, on the one hand, there happen to be a large number of smallish buildings in San Francisco, and on the other hand, the proportion of total floor area and total energy
consumption is highly concentrated in the largest buildings. And so there's a balance there between serving the many and aiming for the actual, measurable moving the needle in terms of energy consumption.

So in terms of using data tools, our objectives in implementing a policy over time have been to aim for consistency, and that's been something that's really drummed into us and we try to take the heart from, particularly a commercial building industry, that very few owners work only in San Francisco.

And frequently, they'll work across quite a few major markets, and so that's one of the reasons that Portfolio Manager needs to be strongly reinforced as a value of having one central tool and interface and reporting mechanism.

We've been interested for years in sharing development resources with other local governments and recognizing that while we have this common front end of Portfolio Manager, all of the 14 communities that now have benchmarking policies have 14 different ways that they manage that data once they obtain it, because there wasn't anything in common between us in the back end.
And so where we have typically a exchange with other communities every six-12 months in person, as well as either typically the monthly SEED call or other mechanisms of engaging with our peers, and we're very interested in learning from others and applying their practices in San Francisco; there's no problem in copying one another at all.

And last, been very interested in structure data and standard format. So for example, when we rolled out the audit requirement, we really rolled it out concurrently with New York City, and we specifically chose our fields to be -- the data fields for reporting to be aligned with what later became BEDES and what also New York City was going to roll out at the same time.

And our data set -- our set of data fields is a subset of New York's. New York really aimed to do a detailed community-wide asset inventory, which is a great endeavor, at the same time as collecting data on the specific energy efficiency upgrade opportunities.

And we try to limit our data collection just to the actual actions that can be taken, and the view was that that was what we could actually put to use in the local market. Throughout that
time, the US DOE has been a great supporter, has I think exemplified those ideas and there's been a lot of work to get where we are, which is pretty close to being able to live up to those ideas.

And they've been, you know, strongly supportive, and they kind of learned some tough lessons along the way. SEED's been in development for sometime and some vendors failed in attempting to meet DOE and the community's needs in developing that software.

So in terms of our personal experience, we've been participating in the SEED development process, as well as BEDES, and basically, all the other DOE efforts that we've been -- have been available to participate in, and really remain excited that there will be this flexible and highly inner operable system.

But there's also a fair amount of projection that I think goes on among potential users about where it's at today, and how -- but sometimes leads to I think a little under-estimation of how much time or effort may be necessary to get to where -- to get to kind of energy data nirvana, supported by SEED.

And so I think mostly that is not a
criticism, just an acknowledgment that some time is needed, that great number of users are really needed and developers also need some time to be working on this for it to mature the ecosystem.

And then I think this graphic is really telling at the bottom, that -- or at least valuable, where what DOE's been working on is essentially the left-hand blue bubble, the SEED core itself, and they -- the vision as I understand it is that there be an ecosystem where you might be able to use just SEED itself unmodified.

You might have -- and any number of products out in the marketplace that build upon SEED but maintain that core code in a very consistent manner. And then you also might have derivative products like your CNC (phonetic), that are not necessarily qualifying for that trademark, but are still really fundamentally part of that ecosystem and may be benefitting from the originally SEED or derive from it.

And actually, we ended up in that place a little faster than we expected. So we've been participating as a SEED beta tester and we remain a SEED beta tester, along with operating our Legacy system.
And as SEED moved to its first -- the SEED 1.1 moved to completion last October, several things happened concurrently, and one was we engaged the primary developer of SEED under contract so that they could do work for us so that we could make sure the system we were going to operate would meet our needs.

And as an organization, strong preference is for Cloud-based solutions where we don't develop a lot of in-house IT care and feeding expertise, and we focus on the subject matter itself and the content. And so we were successful in engaging that contract.

And around the same time, Department of Energy determined how the -- began to determine the rules for when the term "SEED" could be used, and it turned out that the developer at that time and the DOE didn't agree with one another, and so they're -- what we use is not technically SEED.

It's more the Product C category at the moment, that it is derived from the same code base, but substantially modified because we needed a different set of functionality that augments what was already there.

But what's important is are those really
core values of inner operability? So in my opinion
the value of the broader endeavor is most embodied
in BEDES or most strongly embodied in BEDES, that
its inner operability of systems and exchange of
data, and that really addresses the last commenter,
I'm sorry, I don't remember his last name, but
Kevin.

That point about this panoply of databases,
panoply of data standards and you have a lot of
manipulation to move from one to another, even if
you're using substantially similar information, that
is really fundamentally addressed by having this
Data Dictionary, and then building out some data
products around it.

And really been excited for DOE's
leadership on that, but are satisfied with working
with the vendor that we happened to choose, Building
Energy, and their improvements that they've been
applying to our system.

COMMISSIONER McALLISTER: So hey, Barry,
what's your view of sort of, is there -- so that IP
now rests with the developer or is there some
opportunity for the city to help others kind of move
down that same -- get similar functionality to what
you guys needed.
MR. HOOPER: It's a little convoluted. So they have Open Source, the software, but it's not a open or free license.

COMMISSIONER McALLISTER: Right.

MR. HOOPER: To my knowledge. I do have to -- I have to defer for that with them. I know what --

COMMISSIONER McALLISTER: Okay. No, I mean, you don't have me the details, but kind of, in idea what's your kind of optimal approach here?

MR. HOOPER: But your other point, right, so if another city uses their system, then they would have the advantages of SEED and they would also have the advantage of being able to use things that we've had them build into the system to meet our needs.

So there is a kind of open, intellectual property among their user set, and we're also open about how it functions. So it's not like we can't show anyone else. They just aren't directly committed to every bit of code they write going back into the Open Source project.

COMMISSIONER McALLISTER: Got it; got it.

Thanks.

MR. HOOPER: But again, more importantly, I
think, the commitment that is really core for us is maintaining commitment to BEDES and to utilizing the CAPI, and beginning to put our data out there in a much more transparent way.

Right now, we're -- regularly do exports from our current system. Sorry, we're right now in the last stage of this transition is why I'm a little confusing about how I'm referring to future and present tense.

But anyway, our old system is kind of a manual export, really aiming for using API and making information from it as transparently available as possible. And so mostly that is not a criticism of anybody.

It's just recognizing that there's a difference in terms of these things being developed, and what we're looking at today is mostly 1.1 and it's something like a notch or two before, you now, your original iPod, and a lot of our discussion of where SEED could go, it is really where it can go, but it's a few generations to go to get to the current iPod NANO.

And I think even that trademark process and how much editing you can make to the core code before something SEED or not, frankly, I just view
that as a little bit messy and an issue in and of
itself that needs a little bit of time to mature,
rather than something to take as rigid at the
moment.

And so just as a user, some suggestions to
the Commission in dealing with some really analogous
problems of what we've been working with. You know,
I really recommend prioritizing inner operability,
to clearly articulate your values before you pick a
particular software solution and then talking
through with stakeholders about how those values are
being met.

And then you know, in terms of SEED it's
not at all a deviation from what was said in the
last hour or so, but I'd really start with where
SEED already has a maturing use case, and use that
to inform where you go on other aspects of using it.

COMMISSIONER McALLISTER: Okay. Thank you.

MS. BROOK: So quickly, I have an
introductory question. Inner operability and BEDES,
I think that -- so let me just ask instead of just
asserting my opinion. Is BEDES sufficient to allow
inner operability, because it is a dictionary and
not a schema?

MR. HOOPER: Maintaining BEDES compliance
would go a long way to making it a lot more efficient to maintain inner operability, but I think it's also a necessary one, where the boundary of me is that I don't pretend to be a software developer.

MS. BROOK: Um-hum.

MR. HOOPER: But the way I view it is if you have a clear definition of how two terms connect, then you don't necessarily always have to change from your Legacy database to the new one. You can define how they can exchange information more clearly.

MS. BROOK: You can build the map, yeah.

MR. HOOPER: Yeah. So the mapping --

MS. BROOK: I guess what I think what the next step is, is to clearly define use cases and build schemas for those use cases, but I absolutely think for inner operability and the software development world to thrive you have to get to a point where you can validate the data exchange, and I don't think you can do that without a fully articulated schema. And so --

MR. HOOPER: Yeah, do the --

MS. BROOK: -- but like Robin said, they're trying to address all use cases in that dictionary, and you can't build a schema for all use cases
because the hierarchy's going to change, depending
on the use case, potentially.

So I think the next step is potentially to
get some working groups to talk about schema
development for specific use cases.

MS. WADHWA: And I'm just going to segue
right here into what Martha said. Barry, thanks for
bringing SEED back into the discussion. I want to
just invite folks on the WebEx on the call here, and
I think CEC's really interested, is you know, really
stomp on the ground and see where SEED stands, how
we could develop collectively that core, how much of
that needs to come from, you know, larger stake
level versus how much will be local governments
picking up.

So I invite you to join our local state
specific working group, and Barry, your feedback,
since you guys are the earlier doctors, in fact,
would be really helpful to that. So on the call,
whoever's on there, please connect with us if you're
interested in joining the California SEED Working
Group. We will be getting that out shortly.

MR. HOOPER: Thank you. Ron, too, since we
definitely bring very different perspectives --

MS. WADHWA: Absolutely, Ron, absolutely.
MR. MOHR: What happens on the BEDES, and there's something --

COMMISSIONER McALLISTER: Could you speak in a microphone.

MR. MOHR: What's that?

MS. WADHWA: Pull up to a mic.

COMMISSIONER McALLISTER: Microphone.

There you go.

MR. MOHR: Sorry, guys. I was just going to say on the BEDES, so it's not a full-on hierarchy, there are some terms that are defined like site and facility and how they relate to each other, but once you bring in the Building SYNC, which they're calling their auditing kind of schema, it gets really detailed.

MS. BROOK: Right. Right.

MR. MOHR: And based on the type of facility and all, I was kind of impressed. I wasn't expecting much, but I was kind of impressed with the layout, especially for so many different types of occupancies.

MS. BROOK: Yeah. So I think that's an example of what I was trying to say where Building SYNC is the audit use case, and so you can fully articulate the hierarchy you need to support that
use case. So that's helpful. Thank you.

COMMISSIONER McALLISTER: Let's see. Where are we?

MS. BROOK: I think that's the end of actual, formal Agenda. Do you, staff, agree with me? So I think we're ready to wrap up with final comments.

COMMISSIONER McALLISTER: So are there any comments from attendees, either here in the room or on the phone, on the web? I think there are -- there's a lot of food for thought here and a whole bunch of topics that we need to dig into, sort of in due time, you know.

But I'm really gratified at all the high quality participation today and I really thank everybody. George.

MR. NESBITT: George Nesbitt. Back on the utility data access, especially in multi-family when you've got owners of buildings, they have tenants as opposed to having to get authorization from every tenant, which is difficult, and although ideally, that gets built into the lease and it gets signed right away, at least aggregating data, because we're talking about projects that don't necessarily have 100 people.
And I also agree with what's been said, is that while aggregate data is nice, but a lot of times we need to track specific. So it would be, you know, you'd like to track an apartment over time if you're making retrofits.

I mean, if it's aggregated you're still going to see some things, but you may want to see change in occupancies with different tenants and that kind of stuff. Then I guess one of the overriding, we talk a lot about consistency, and yet we have a lot of inconsistency.

We just talked about SEED. We've got HR's Registry. CPUC is doing whatever it's doing. We've got rules that say we need to do one thing, we do another. You know, sadly, it looks like software is being opened up for Energy Upgrade California, yet four out of the five software products have no ability to do code compliance.

And I can tell you, a lot of these projects, actually all, should be showing code compliance through a computer performance method, because they probably, despite being performance-based, may not actually meet all those standards.

So you know, we have a lot of duplicate processes and money being spent. Yes, we need
choices, and I think actually in the HRs Title 24 we have built in abilities to have software choice, but still, if you put in the same inputs you get the same answer, because a lot of us in the room have been -- we know that if you took two pieces of software, put in the same inputs we got totally different answers, and that kind of thing is not acceptable.

MS. RAITT: Anyone else in the room? We do have one person on WebEx, Steve Uhler.

MR. UHLER: Am I on?

COMMISSIONER McALLISTER: Yes, we can hear you.

MS. RAITT: Yes.

MR. UHLER: Steve Uhler, U-h-l-e-r. A question on data ownership. I'm a POU customer and they have data on the site that is actually incorrect. It's almost $2,000 off on my billing, as well as my Smart Meter, when I read my Smart Meter, its face, the data that they show me accumulated doesn't match.

So is there going to be some mechanism to get these kind of things corrected? I've reported it to them, but they've done nothing in that area. The other area is the Appliance Database. I agree
with the gentleman about all the databases on appliances, they don't match.

   The Energy Commission's database doesn't even match the regulation data structure that shows in, what, 1608 or something like that, Table X. There's missing fields. There seems to be fields that don't really apply, like an electric water heater that talks about how much BTU input it takes and stuff like that.

   I requested a Data Dictionary, but they said that there was none available. It would be really helpful for me as an energy user to be able to use this data, if you folks would have things like a Data Dictionary.

   An example, a dishwasher, there's supposed to be something about soil control or whatever. It's not displayed on your site. When I go to look at refrigerators and I try to add filters, it doesn't allow me to add filters.

   You have data in like refrigerator type that is not allowed, even by your data input form. And I'm kind of wondering will that kind of stuff be cleaned up? When I look at all of the stuff talking about BEDES and so on and so forth and all these data translation things, you know, I've worked in
manufacturing, engineering for a long time, and I've seen people try to put stuff together and nobody can agree, and then it finally falls off the edge because nobody uses it.

Some of the stuff falls into a realm of what I call write-only memory. Nobody ever looks at it. Is there anything going to be done to improve interfaces for a customer like me? Your Appliance Database is basically unusable on a mobile device.

Now, I see there's some sort of modernization, but what kind of improvements do you have in those areas before we get into all of this data? The anonymization of the data, somewhere there's going to be some foreign key table sitting someplace that has to stay static, if from each time there's a data dump that this anonymization works. How is that all going to be handled and what if somebody gets a hold of that foreign key table? They're certainly not going to let anybody know they have it as they then process this data outside. Thanks.

COMMISSIONER McALLISTER: Go ahead.

MS. WADHWA: Thank you, Steve. This is Abhi Wadhwa from Energy Commission. The appliances in existing buildings office is indeed working on
the Appliances Database Modernization Project, and
we have one Appliance Database in place right now
which we now consider our Legacy Database as we are
going into phase two of it and looking to resolve
some of these problems.

While I've noted your comments and they're
also on record, we would highly encourage you to
submit them as part of that docket, as well. And if
you want to get in touch with me and note my name, I
can connect you to the people who will take your
comments.

COMMISSIONER McALLISTER: Great. Thanks.

Oh, go ahead, Matt, yeah.

MR. GOLDEN: I'll keep this mercifully very
short. But since we were talking about BEDES and I
was talking about Investor Confidence Project, I
just wanted to put it on the table that there's an
effort that's just spooling up where we're going to
take the data, the documentation actually, which is
not data currently, and there's going to be an
effort to map that to BEDES.

So there'll probably be a gap analysis
along with that. And so we'll have like an Initial
ICP Compliant BEDES Data Spec. That's what they
want us to call it. Got to go come up with a better
COMMISSIONER McALLISTER: So it would go, be kind of another line in that table that Robin presented where it's got, okay, we're mapping Portfolio Manager; we're mapping the Standardized Data Dictionary.

MR. GOLDEN: Yeah. And I'm not sure where it'll go in their table, but yeah, it'll be that --

COMMISSIONER McALLISTER: Like that.

MR. GOLDEN: Yeah. There'll be an output. Instead of just a bunch of PDFs, there'll be a data that can be transferred.

COMMISSIONER McALLISTER: Yeah, great.

Great. So I guess -- so this has actually helped me crystallize a little bit about these different tools, and kind of, you know, be good if people could help us in their comments sort of in a more rigorous kind of figure out the path forward.

It sounds like BEDES is a resource that everybody agrees is pretty foundational, and then kind of beyond that, individual needs might dictate individual pathways. And hopefully, we can figure out how all those, at least from city and state, can work together, and then other complementary databases that might be helpful to integrate.
MS. BROOK: Yeah. I think we really need to talk with the Energy Data Access Committee.

COMMISSIONER McALLISTER: Committee, yeah.

MS. BROOK: And make sure that they are trying to incorporate BEDES in their work.

COMMISSIONER McALLISTER: Yeah. And we have a person on, there is a Commission representative on that, and I know a couple of our offices at the Commissioner level are also tuning into those discussions. But we should definitely formalize that if it's not already.

And I want to thank the PUC for putting that together and pushing it forward. Let's see. I guess there were a couple thing that really we didn't touch on all day, and I just want to make sure people in their comments don't leave them out.

Well, Ethan mentioned at the beginning this Rates Information Database, and I want to -- really, I'm interested in knowing kind of what the utilities think that would entail more than anything, but a standardized web enabled, you know, "machine readable," but essentially, a standardized format that can be read automatically to do analysis.

You know, anybody who knows their tariff can use it, but also, just to do bulk analysis,
maybe on schools or on, you know, some type of building or even just having access to all the updated rates. I mean, that's just huge for the marketplace.

And it has value. We've seen a couple of times where private entities have put that together and they've gotten bought. So they're actually public, so we need to keep them in the public domain, and we heard a lot of public comments over the last year and a half to that effect. So that's 2.1.5.

Then, let's see. There's also 2.1.7, which is the sort of making the -- I know the PUC's done some of this, but essentially integrating or making highly compatible with the various low income program databases.

So that's the WAP and the Low Income Energy Efficiency, that's the strategy in here and it'd be good to know from the utility's perspective, and potentially, from the Agency's perspective over at CSD what that might look like.

And you know, not the first time this has been brought up, but you know, again, we're trying to reduce friction and transaction costs and duplication of effort. So that seems like an
obvious one. Okay. I guess that's -- I just wanted
to highlight those two that seemed like they were a
little bit under-baked today.

But if anybody else has any comments, speak
now or forever hold your peace.

MS. RAITT: Let me just give the folks on
the line an opportunity real quick. So we'll need -

COMMISSIONER McALLISTER: Not forever, but
just for now.

MALE SPEAKER: The public comment just
ended.

COMMISSIONER McALLISTER: Yeah, exactly.

MS. RAITT: So mute your phones unless you
wanted to make a comment. We'll open up the lines.

Okay. I think we're done here.

COMMISSIONER McALLISTER: All right. Well,
great. Say, hey, right on time, 5:00 o'clock. We
captured. So I want to thank staff, Eric, David
and Abhi and Martha and Daniel, also, who's not
here, but just the whole AB 758 team, Consuelo, as
well, on the 758 team.

So please feel free, those of you who are
interested in this and are thinking -- who are
developing your comments, I mean, we are very
interactive and try to be available, certainly, to help figure out what's most helpful so you don't spin your wheels unnecessarily, but really focus on the things that are going to have an impact.

I want to also thank my advisers, Hazel Miranda and Pat Saxon, for just doing a lot of lifting on the 758 Action Plan. Also want to point out Charles Smith, who's new to my office. That'll be a resource for us, as well.

So any of us, please communicate with on any of the topics in 758, including data. And then finally, and not least, I want to thank Heather and Raquel and the IEPR team for all of their, Stephanie and the others in the IEPR team for keeping the trains running more or less on time, and at least trying.

I know it's hard, but happy with today, and certainly looking forward to everybody's comments. And did we have a date? You've got it right there, April 28th.

MS. RAITT: April 28th, please, for written comments.

COMMISSIONER McALLISTER: All right. So is there anything else? There are the instructions, April 28th, looking forward to your written
comments. Thanks, everybody.

(Whereupon at 5:00 p.m., the workshop was adjourned.)