

1 CALIFORNIA ENERGY COMMISSION
2 WORKSHOP ON THE DEVELOPMENT AND SCOPE OF
3 MARKET FACILITATION INITIATIVES
4 FOR THE ENERGY COMMISSION'S PROPOSED 2015-2017
5 TRIENNIAL INVESTMENT PLAN FOR THE
6 ELECTRIC PROGRAM INVESTMENT CHARGE PROGRAM
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10 TRANSCRIPT OF PROCEEDINGS

11 California Energy Commission

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Panel 1:

Blaine Collison, US Environmental Protection Agency

Ardie Dehghani, University of California Davis

Camron Gorguinpour, US Department of Defense

Winifred Kwofie, University of California San Francisco

Bob Raymer, California Building Industry Association

Christine Vance, Energy Coalition

Randy Walthers, Raley's

Panel 2:

Beverly Alexander, Energy Institute at Haas, UC Berkeley

George Crandell, Technikon

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A P P E A R A N C E S C O N T I N U E D

Jennifer Garson, EERE, US Department of Energy

Josh Gould, ARPA-E, US Department of Energy

Cole Hershkowitez, Chai Energy

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SACRAMENTO, CALIFORNIA, February 7, 2014

9:56 a.m.

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MS. DOUGHMAN: So we're going to get started. Welcome to the Workshop on the Scoping of the Second Proposed EPIC Investment Plan that the Energy Commission will be developing soon. Just to go over the emergency procedures, for those of you not familiar with this building, the closest restrooms are located behind this wall over on this side. There is a snack bar on the second floor under the white awning. Lastly, in the event of an emergency and the building is evacuated, please follow our employees to the appropriate exits. We will reconvene at Roosevelt Park located diagonally across the street from this building. Please proceed calmly and quickly, again, following the employees with whom you are meeting to safely exit the building. And I will just add as well, if it's not an emergency, please exit by the guard, otherwise an alarm will sound. Thank you.

So -- oh, the other thing is there are handouts for today's workshop on the table as you walk in, and there are blue cards. If you are planning to speak, please write your name on the blue cards and the topic

1 you plan to address. Also, for those who are speaking,
2 please be sure to give your business card to the court
3 reporter.

4 All right. Now, Laurie ten Hope will give some
5 welcoming remarks.

6 MS. TEN HOPE: Good morning. I just want to
7 welcome everyone to this workshop. I'm Laurie ten Hope.
8 I'm the deputy director for research at the Emergency
9 Commission. I want to thank our panelists. We're very
10 much looking forward to your input and to those of you
11 who have -- who have come today in person. Many of you
12 have been participating in the development of the
13 Electric Program Investment Charge Program, so you're
14 familiar with it. But I think some of you may be -- may
15 be new to this -- to this process. So I just want to
16 provide a short context and then you'll -- we'll hear
17 from our CPUC colleague who will go into a little bit
18 more detail. But the Electric Program Investment Charge
19 is, is a charge that provides funding for clean energy
20 technology development, and so it really provides us an
21 opportunity to develop technologies that will help us
22 fulfill our policy goals. The State of California is
23 embarking on a low carbon energy path that has a lot of
24 renewables, energy efficiency, combining power, electric
25 transportation, some really cutting edge technologies

1 that will provide customers with clean, affordable,
2 safe, and environmentally benign energy sources but that
3 future is -- brings with us some technology challenges
4 of how do we incorporate this in a way that works for
5 customers that is not too complicated on the grid,
6 that's still safe with two-way power flow. That's what
7 this funding is there for, is to bring innovative
8 technologies to bear that will provide these solutions
9 at the, the lowest costs, the lowest costs possible.

10 In developing this program, for those of you who
11 have been engaged, it's a little, maybe, confusing that
12 we are in a state right now where we're implementing our
13 first investment plan, and we're planning our second
14 investment plan. So just for a little bit of context,
15 we, along with the three investor owned utilities,
16 developed an investment plan for what our research would
17 be for a three-year period, and we're just launching
18 that right now. So there will be program opportunity
19 notices for researchers who are interested in doing
20 research or those of you who want to just follow with
21 what the new technology developments are. The Energy
22 Commission, along with the utilities, will be issuing
23 solicitation soon. We expect in February to start
24 issuing those solicitations. The ones that are planned
25 for the next few months are posted on our -- on our

1 website. So, you know, stay tuned for that.

2 This workshop is to kick off the planning for the
3 second triennial EPIC Investment Plan, which is the
4 investment plan for 2015, 16, and 17. And so we are --
5 we have, sort of, a two-prong process to kick off
6 soliciting ideas. One is a questionnaire that you'll
7 hear more about from Pam that's been circulated on our
8 list serve, but if you didn't get it and you have ideas
9 for research initiatives, we really want to hear from
10 you before we develop our draft plan for 15, 16, and 17.
11 But today, what we're focusing on is one element of the
12 investment plan, which we call Market Facilitation, and
13 in that area, we're really interested in experience and
14 ideas for how do you accelerate that path to market.
15 And we developed a -- you know, we have a good
16 technology. We know it's good. Maybe the test site
17 knows that it's -- you know, that it works. But, you
18 know, how do organizations make decisions to widely
19 deploy these technologies. So our first panel is going
20 to provide us some insights about how we might
21 accelerate this path to market. What, what products,
22 tools, experience is needed to help make, you know, make
23 those decisions, and our second panel will help us with
24 some of the challenges of entrepreneurs in that last
25 valley of death. What kind of financial incentives

1 might be helpful or, you know, other kinds of strategies
2 that -- visibility strategies that help really
3 accelerate the path to market. We know we can get a
4 path to market, but can we do it faster and better and
5 get the higher quality technologies deployed. So that's
6 really our purpose. I'm really excited with the
7 panelists that are here, and I'm going turn it over to
8 Pam to introduce our speakers. Thank you

9 MS. DOUGHMAN: Thank you, Laurie.

10 The first speaker today is Cem Turhal at the
11 California Public Utilities Commission.

12 MR. TURHAL: Thank you, Pam. Thank you,
13 Laurie. Hello, everyone. Thank you for joining. My
14 name is Cem Turhal, and I'm an analyst at the CPUC
15 currently responsible for the EPIC program. Before I
16 begin my introduction, I would like to thank the CEC for
17 all their hard work in starting to get the second
18 investment cycles and get the program going.

19 So with that, let's go to the second slide
20 please. Okay. So Laurie went over most of the slide
21 already, but from the CPUC's perspective, the EPIC
22 program is focused primarily on support of
23 pre-commercial efforts with some additional support for
24 more market facilitation activities, which we'll cover
25 in detail in the next slide. The support for the EPIC

1 program provides -- the support that the EPIC program
2 provides is largely intended to help fill the gaps in
3 funding that exist for technologies where were
4 underfunded traditionally through, like, private
5 capital. After its deliberations, the CPUC determined
6 that EPIC program provided electric rate payers with
7 benefits and promoted greater reliability, lowered
8 costs, and increased safety. This is an important
9 finding, as all projects overseen by the CPUC need to
10 have some sort of ratepayer benefit, and the CEC did a
11 great job in showing us that in their investment plan.
12 The finding for the project will be primarily awarded
13 through competitive solicitations, but that does not
14 preclude the PAs from using noncompetitive awards as
15 well. All of the awards that will be made, will be made
16 public in the PAs annual reports, which they will file
17 the next -- February. Next slide, please.

18 So the next two slides will cover the initial
19 investment plan funding amounts that are not adjusted
20 for January 1st of 2015 for each of the funding areas.
21 In this slide, again, just for the initial investment
22 plan, and it's not adjusted for the January 1st, 2015
23 plan, the EPIC funding was around \$162 million. I
24 should note that in 2012, however, the program budget
25 was \$143 million based on the Commission's state

1 position of the EPIC proceeding with that amount
2 allocated across areas in the same proportions. The CEC
3 will have the lion's share of the budget in the second
4 program as well, and each of the categories, as you can
5 see, it's broken down to applied research, technology
6 demonstration and deployment, and market facilitation,
7 and again, these figures will be adjusted in January
8 2015 to commensurate with the average change in consumer
9 price index. And this is per the phase two decision,
10 and the language can be found in that as well. Next
11 slide, please.

12 Again, this table is also for the 2012-2014
13 triennial investment plan, but this is a table that's
14 showing the EPIC funding for each program
15 administration, administrator from the November 14th of
16 2013 EPIC decision approving the program administrators'
17 proposed investment plans. As you can see, the total
18 amount towards the initial investment cycle was a total
19 of \$467 million. And there's only a year left -- less
20 than a year now -- to make all these allocations. Given
21 the shortened timeframe of initial investment plan cycle
22 and for the purpose of the initial investment plan
23 cycle, order in paragraph 39 of the latest EPIC decision
24 allows the uncommitted and unencumbered funds that
25 would, under normal circumstances, be returned to rate

1 payers and requires them to be rolled over as if those
2 funds were encumbered and committed. The numbers,
3 obviously, will change again once the CPI adjustment is
4 made in January, but it would be somewhere in the
5 ballpark of this number. Next slide, please.

6 So as Laurie mentioned earlier, the EPIC program
7 is now live. So it started back in November of 2012
8 where the program administrators -- submitted their
9 respective proposals for their investment plans, and the
10 CPUC deliberated on and approved on November 14th of
11 2013 a complete year for proceeding. So now, moving
12 forward, there -- the -- each of the PAs will be holding
13 competitive solicitations and grant awards to specific
14 bidders, and they will file reports on these awards and
15 their amounts and who the award was made to per the
16 November 14th decision language. In the CPUC's ruling,
17 the whole thing will be to, to continue to provide
18 oversight to the EPIC program, and, and the proceeding
19 to, you know, go through second investment plan, and I
20 think November is the time that we, at CPUC, are
21 thinking about, you know, finalizing the deliberations
22 and having a decision on the second investment plan
23 cycle. Next slide, please.

24 The next steps for the EPIC program. The public
25 administrators will submit their second investment plan

1 applications to the CPUC on May 1 of 2014. This
2 workshop is a -- is a requirement that is a result of
3 the base year decision to have stakeholders come in, and
4 I'm really excited to hear the panelists speak on some
5 of the issues that we're facing. And after receiving
6 the second phase investment plan, the proposed
7 investment plan, the CPUC will begin it's deliberations
8 again, have a decision hopefully out by November of 2014
9 that will make the second investment plan active by
10 then.

11 So this is the EPIC program CPUC schedule. This
12 is something that was in the phase two decision of the
13 EPIC program. Again, this is specifically for the CPUC
14 schedule. So these may change depending on how, how we
15 see the stakeholders would like to see changes made or
16 if there are any concerns with something or there are
17 actually delays. These could be shifting around, but
18 this is -- was the base decision outlined and we are
19 going to try to stick to it as much as we can.

20 So as you can see, in the second investment plan,
21 development of the investment plan will be from January
22 through March, and May 1st of 2014 is when those plans
23 will be submitted to the CPUC. And the CPUC will begin
24 its deliberations in May and hopefully be concluded with
25 them in November to have an actual decision in December.

1 Next slide, please.

2 As mentioned earlier, each of the program
3 administrators will file annual reports starting on
4 February 28th. They filed one last year, which did not
5 contain anything since the programming was not launched.
6 And they're going to be filing another one this February
7 28th, and we're looking forward to that. And in 2016,
8 the CPUC will hire an independent evaluator to see where
9 and how the program is going and see if there's going to
10 be any changes that need to be made to the program.

11 Next slide, please.

12 So how can you get involved. We tried -- we just
13 recently updated all this. You can visit that link that
14 is before you, and this is the EPIC proceeding number.
15 This is the -- this is the application number for the
16 previous EPIC decision and rulemaking. So if you
17 subscribe to this service list, as soon as the
18 investment plans come in as applications, the CPUC will
19 open up a new docket and everyone that is subscribed to
20 it will be transferred on to the new proceeding. And
21 so -- you know, if you subscribe to this, you will be
22 automatically subscribed to the next service list as
23 well. This is where we're going to send out the emails
24 and any updated information about the next rulemaking
25 that the applications will start.

1 So you can see in this link, again, you can see
2 all of the previous CPUC information, investment plans
3 that were filed, comments to those investment plans,
4 reply comments, rulings that the ALJ has made, and the
5 decisions that the ALJ has made regarding the EPIC
6 program. Next slide, please.

7 I believe I -- I wanted to provide everybody with
8 all the EPIC web pages beginning with the CPUC, which
9 has all these -- all these links, hyperlinks, there so
10 you can easily access them through the CPUC's web page.
11 CEC's web page, they have done a great job since early
12 2012 to -- I mean, 2013 -- to get all of the information
13 they can on their website and they -- the three
14 facilities also have now launched their EPIC web pages
15 and the links are below. Next slide, please.

16 I, unfortunately, will be leaving the Energy
17 Commission Strategy Team, and so Damon Franz will be the
18 proper contact at this point, and he will assign the new
19 email list to the EPIC program, and I'll hopefully be
20 working with you guys, and I'm looking forward to seeing
21 where the program goes. So thank you, and I'll turn it
22 back to Laurie.

23 MS. DOUGHMAN: Thank you, Cem. I'm going to
24 give a few points going over the Energy Commission
25 process and schedule for the proposed 2015, 2017 EPIC

1 Investment Plan.

2 So this slide provides a rough idea of the
3 estimated start times for each panel and the afternoon
4 staff presentation. The first panel will begin shortly.
5 Each panel will be followed by a public comment period.
6 Also, there will be a public comment period after the
7 staff presentation.

8 Today's workshop on the Scope of the Market
9 Facilitation Program area of the Energy Commission's
10 Proposed Second Investment Plan is accompanied by a
11 questionnaire on all areas of the second EPIC
12 investment. Written comments and responses to the
13 questionnaire are due February 13th. The Energy
14 Commission is one of four administrators of the EPIC
15 program. Southern California Edison, San Diego Gas and
16 Electric, and Pacific Gas and Electric are the other
17 four -- or other three -- administrators. They plan to
18 hold a scoping webinar on February 21st for their second
19 EPIC investment plans. The Energy Commission plans to
20 post a draft proposed second EPIC investment plan in mid
21 march and hold a workshop on the plan at the Energy
22 Commission on March 17th. The March 17th workshop will
23 be held in coordination with the IOUs. This will be
24 repeated in Southern California on March 21st. The
25 Energy Commission will post a proposed second investment

1 plan in mid to late April. The Energy Commission plans
2 to consider adopting the proposed plan at an Energy
3 Commission business meeting in late April. The Energy
4 Commission plans to submit the proposed plan to the CPUC
5 on May 1st. Investor owned utilities proposed EPIC
6 investment plans are also due on May 1st. As Cem
7 discussed, the CPUC will hold a proceeding to consider
8 the proposed plans from May through November. The
9 current schedule shows a CPUC decision modifying and/or
10 adopting the second EPIC investment plans in December.

11 This slide --

12 MAN ON TELEPHONE INTERCOM: Hi, Mike.

13 MS. DOUGHMAN: Sorry?

14 This slide summarizes opportunities for
15 stakeholder input on the scope of the Emergency
16 Commission Second EPIC Investment Plan. We encourage
17 written comments addressing -- addressing the questions
18 on the agenda. Also, interested parties are encouraged
19 to complete and submit the questionnaire for all areas
20 of the Energy Commission's EPIC program, including
21 applied research and development, technology
22 demonstration and deployment, and market facilitation.
23 Please submit written comments and the completed
24 questionnaire by email to docket@Energy.CA.GOV and
25 prab.sethi@energy.ca.gov. Please indicate 12-EPIC-01

1 and EPIC Second Investment Plan in the subject line.
2 You may also submit your comments and questionnaire by
3 mail at the address shown here. Comments and
4 questionnaire are due February 13th. For more
5 information, please go to the Energy Commission's EPIC
6 web page.

7 Now, let's begin the first panel. Virginia Lew
8 will be the moderator.

9 MS. LEW: Good morning. Many facilities and
10 procurement managers face a lot of barriers to install
11 clean energy technology into our facilities. Today,
12 we'll hear from our panelists who will tell us about --
13 to give us their insights and experiences in that area
14 and possibly provide some additional input that we can
15 include in helping to facilitate our process.

16 So I'm going to ask each of the panel members to
17 give a brief introduction about themselves and about
18 their experiences in this area, and we have about four
19 questions, and we're hoping to open it up for public
20 questions and answers about 12:00 o'clock. So let's
21 hear from Winifred.

22 MS. KWOFIE: Good morning. My name is
23 Winnie. Kwofie is the last name. I work for UCSF down
24 in San Francisco, and I came with Dave Colsome, our
25 expert on procurement. I work in the facilities

1 department, and one of the things that we have been
2 doing is working with Mike and trying to integrate some
3 of these technologies into our -- down at UCSF. It's
4 been an interesting challenge. We're always -- as on
5 every campus, we face changing old to new, and the
6 integration will always come as a challenge to adapt the
7 old ability to these new systems. We continue to work
8 with the procurement, looking for new ways to make this
9 happen and look forward to my friends, here on the
10 panel, to learn how what they're doing on their side.

11 MS. LEW: Thank you.

12 Ardie?

13 MR. DEGHANI: Good morning. My name is
14 Ardie Dehghani. I think you can hear me. I'm with the
15 designer and construction management office at UC Davis.
16 I'm the director of the engineering and working on the
17 capital side of the UC Davis facility. We -- our office
18 manages all construction project for capitol project, so
19 we manage design and construction which goes through to
20 a bidding phase. All of our contracts are bid in
21 accordance with public contracting codes.

22 I thought maybe I'd give you just a rough idea
23 about our campus. Our campus is about a 53 hundred-acre
24 campus in Davis. It's got other facilities outside of
25 Davis, but the one in Davis is 53 hundred. We have

1 34,000 students, and it's estimated that we would have
2 5,000 more by 2020. So we are in the growth mode. We
3 have roughly 11 hundred buildings, totalling
4 approximately 12 million square feet facilities. It's
5 interesting that a lot of these facilities were built in
6 50s, 60s, and 70s, and you all know the challenges with
7 renovation inside these facilities especially with
8 building materials that add cost to the mix.

9 UC Davis has its own quality treatment plant. We
10 have our own detention basement called "R Freedom" for
11 store management. We have our own underground belts for
12 domestic and landscape water system. We purchase volt
13 electricity and distribute it in our campus by our own
14 12 KV distribution network. We have massive underground
15 12 KV. Same as natural gas. We purchase both and
16 distribute to our facility under UC Davis facility's
17 management leadership. We have a heating, cooling
18 central plant. We put in a five million gallon storage
19 tank thanks to CEC and CPUC about a decade ago and
20 really, truly have helped us shape -- our electricity is
21 very low. Our purchased electricity is low. Roughly,
22 it's somewhere between six and half cents and a seven
23 and a half cents a kilowatt an hour. No time of use
24 penalty attached to it, but we are a sustainable campus,
25 and we would like to pursue sustainability to help our

1 campus. Our peak is about 50 megawatts. Our off peak
2 approximately 16. So we are a 24/7 research facility
3 that use a lot of electricity during off hours. We,
4 currently, have one megawatt of solar on our building,
5 and we completed construction of 800 KW digester
6 project, again, with the help of CEC incentive program.
7 That's in partnership with clean world. It takes our
8 garbage and develops energy. We saw a closing of our
9 landfill here pretty soon. We are in process of
10 procuring 14 megawatt solar farm on our campus -- it's
11 going through a procurement process and, hopefully,
12 we'll have that executed within the next month or so.
13 We will complete construction by end of 2014. We have
14 14 LEED accredited buildings, seven are platinum. These
15 are large facilities, the majority are laboratory. So
16 emerging technologies for energy have played a
17 significant role to make those possible.

18 UC Davis -- it's interesting, our electricity use
19 in 2012 is about the same as those in '93, although we
20 have added about three million square feet of facility
21 since. One of the main reasons we -- with CPUC
22 leadership and with the partnership at PG&E, we have a
23 state-wide energy partnership program under the same by
24 design. It's 2009 through 2014 program. That program
25 has helped us reduce our electricity, so far, by 45

1 million kilowatt hour and 2.5 million therms.

2 So this gives you some idea about where we stand
3 with energy. It's really important to us, and we hope
4 that we will learn more from you all about things that
5 we could implement on our campus. Thank you.

6 MS. LEW: Thanks. Thank you.

7 Christine.

8 MS. VANCE: Good morning. I'm Christine
9 Vance, and I'm a director at the Energy Coalition. And
10 thank you very much for the opportunity today to be a
11 part of this panel.

12 the Energy Coalition is nonprofit based in
13 California, and we have been a leader in energy
14 efficient policy and education and government programs,
15 energy efficiency programs for the last thirty years.
16 Prior to joining the Energy Coalition, I worked for
17 about -- more than 25 years developing and implementing
18 energy efficiency programs in the public sector, a large
19 part of that in the city and county of San Francisco.
20 And the last about four or five years I was working at
21 San Francisco, we started to use, in particular,
22 definite quantity contracts that we -- that offered all
23 kinds of advantages to adopting, deploying -- not just
24 energy efficiency measures -- but all kinds, especially
25 advanced technology. So I'll be drawing from that

1 experience.

2 And, more currently, I'm the program director
3 heading up the implementation of a public agency energy
4 services for the Southern Cal regional energy network.
5 And if you haven't -- most people here have probably
6 heard of the Rens but in the -- in the program cycle
7 for 2013, 2014, the CPUC made a decision to have some
8 funding go toward regional energy networks in order to
9 really leverage the collective action of local
10 governments, and, and kind of serve some more innovation
11 and support for the greater scaling of projects. And on
12 behalf of Los Angeles County, there -- the administer of
13 the Southern Cal Ren, the energy solution was hired to
14 develop a program, an innovative program, that provides
15 a set of turnkey services that are trying to address all
16 of the various barriers, not just for advance
17 technologies, but for all technologies.

18 So we provide a whole suite of cradle-to-grave
19 technical services along with the project financing.
20 And the program is launching September. We have to-date
21 enrolled 27 agencies. We have initiated over a hundred
22 projects, and many of those underway, one already
23 completed in fact. So I think part of the -- part of
24 this regional energy network is trying to bring together
25 the collective, kind of, wisdom on the entire, you know,

1 contracting and engineering community. We have 19
2 energy engineering firms on board that we draw from and
3 employ. We also have 14 contractors on board saying
4 that they're ready to send out the competitive bid
5 process through the national joint power alliance. And
6 what we have done is adapted this particular contract
7 investment specifically for energy efficiency where we
8 have developed construction price catalogs and basically
9 spent four months with the best in the field with energy
10 solutions on lighting and mechanical and other firms
11 weighing in to bring together in that catalog. We have
12 all of the incentivized measures from -- along with
13 other kinds of advanced technology. So I'll be saying
14 more about that.

15 In terms of just, just a few high level thoughts
16 that I had, the kinds of -- the kind of barriers when
17 you're -- when you're a -- when you're a public agency,
18 especially, you know, my experience is more public
19 sector, you get a lot of different vendors coming and
20 trying to sell different things, and it becomes
21 difficult to, you know, what to believe. And, you know,
22 so there's a whole host of things that help that
23 situation. You really need some third party objective
24 advice I think. And so the first point is just that the
25 barriers that impact advanced technologies are the

1 same -- some of them -- are the same barriers that
2 impact all energy efficiency, you know, lack of staff,
3 difficulty procuring quality engineering, and quality
4 construction, which are both key, lack funding,
5 financial analysis to help make the, the proposition
6 case for some technologies that may have a higher first
7 costs and so forth. But it's just that advance
8 technology, they have all those same barriers but they
9 have additional barriers, right, or emerging market.
10 And so there's a variety of things to help in that way,
11 and there's, there's different examples like, you know,
12 lighting, LED lighting, and so forth. Am I --

13 MS. LEW: Yeah, I think we need to move on,
14 and so we can cover your comments in some of the
15 questions later on.

16 MS. VANCE: Yeah, uh-huh.

17 MS. LEW: So Bob?

18 MR. RAYMER: Thank you, Virginia. I'm Bob
19 Raymer. I'm a senior engineer and technical director
20 with the California Building Industry Association. CBIA
21 currently has about three and a half thousand member
22 companies. On an annual basis, we produce about 90 to
23 95 percent of the new homes built in California each
24 year. By way of comparison, we used to have about 8,000
25 member companies going back about seven years, but then

1 the housing sector fell through the floor. The good
2 news is we're beginning to finally see a nice spike in
3 construction. And I suspect -- 2013 was the first real
4 uptick that we saw. 2014, we're expecting very similar
5 or better results, and so with that, sort of my job and
6 what I do for building industry, I have had this job for
7 the past 31, 32 years. I have been working with -- and
8 in some cases not necessarily with -- the CEC on a
9 variety of updates of the energy efficiency standards.
10 I have worked on the last ten of these updates. It
11 happens every three years, and part of the challenge
12 from my job is to try and see the mass application of
13 emerging technologies or emerging building systems. One
14 of the more recent is the emerging technology, of
15 course, rooftop solar. It's one thing to have a couple
16 of great examples here or there, but we're trying to get
17 this to where it's not only on ten or twenty buildings;
18 it's on hundreds of thousands of buildings. And so
19 there's challenges because you've got a workforce that
20 needs to understand, needs to be able to incorporate.
21 You need product purchasing that sort of comes up to the
22 challenge, and along with that, we're also very
23 interested in emerging building systems. And that's
24 become more of an issue in the past five to six years,
25 as you can imagine, as the CEC updates the standards

1 every three years, the standards get more stringent.
2 And now that we have had ten very clear, very rigorous
3 updates to those standards, a lot of the low-hanging
4 fruit is gone. In my opinion, pretty much all of it is
5 gone. There's still a lot more that can be done in
6 terms of energy efficiency. It's just getting a lot
7 harder and more expensive. And so we have to,
8 effectively, prepare tens of thousands of workers,
9 designers, subcontractors, contractors, product
10 purchasing agents, sales agents. There's an immense
11 number of individuals that's involved, and the
12 development, the design, the construction, and the
13 selling of these homes, they all need to get on board
14 with this. And so part of what I'll be looking at
15 through the EPIC funding and through a variety of other
16 CPUC and CEC funding opportunities is how to help
17 continue the role that solar is seeing, rooftop solar is
18 seeing right now. I'll get more into that, and also how
19 we can help do pilot projects and a variety of the other
20 things with these emerging building systems, and that
21 will be largely my comments in question number four. So
22 with, that --

23 MS. LEW: Thank you.

24 So let's hear from Randy.

25 MR. WALTHERS: Hello, everybody, and thanks,

1 Virginia. My name is Randy Walthers, and I'm the energy
2 utility manager for Raley's stores in Sacramento here.
3 It's kind of a unique company. We are a privately owned
4 company with 129 stores in northern California and
5 northern Nevada. We are on a management team with
6 Raley's, which our owners are backing, very much in the
7 sustainability and energy efficiencies in our building.
8 When I came on as the energy manager ten years ago, our
9 average buildings were running about a 500 KW peak load
10 and we're down to under -- about 250 now with energy
11 efficiencies. A lot of these were backed with a lot of
12 money through the CPUC and different programs like EPIC.
13 UC Davis is very much in our back pocket here, a lot of
14 times helping us with a lot of different emerging energy
15 efficiencies. In fact, we're doing a couple of projects
16 right now with them that are on the -- more on the waste
17 side with digesters and we're going to convert all of
18 our digestibles in our stores into gas and/or
19 electricity.

20 But other than that, it's kind of a unique
21 company in that I'm kind of left alone. If I see
22 something that's new and exciting, I try it, and I will
23 try it at one or two stores. We have a store now that
24 is going to be fully controlled, which is part of the
25 CPUC guidelines, of electronic controls with lighting,

1 skylights with movers on the skylights to keep a
2 constant light level in the store, and we're probably
3 going from about a -- oh -- one and half -- or about 125
4 KW lighting load down to about a 45, which is the new
5 lighting technology with LEDs. So we're kind of unique,
6 and I'm here, basically, as an end user of what happens
7 here. I'd like to see when there's money being
8 broadcast, but I do, like Bob said here, wonder about
9 all the different people out there. You know, I get a
10 hundred calls a day selling solar. "Who are you?"
11 "What are you?" I usually go to end user and work on
12 that. You know, we have 1.5 megawatt solar system on
13 our DC right now that I don't think anybody even here
14 knows. We're kind of quiet that way. If it make sense,
15 we do it. You know, we don't really broadcast a lot
16 out. This is kind of unusual for Raley's to come out
17 and, you know, broadcast what we have done or what we're
18 doing. We are in the middle of another 1.5 megawatt on
19 that same warehouse, and we're doing 25 stores right now
20 on contracts. It's a little bit harder when we don't
21 own the store. We have to work on the, you know,
22 owners' side to get the, the leases, you know, right for
23 them if it's a long-term lease. Usually, you need 25 to
24 30 years to make solar work. And so we're in
25 negotiations for that. We are looking at fuel cells in

1 our stores, and that will take over the critical side of
2 our energy as far as keeping our frontline going and our
3 computer lines going. I've said the digester, and
4 basically that's about it.

5 I do utilize, though, and like Bob said,
6 different companies there. Grocery stores have a high,
7 high energy usage, and there's a lot of rebates out
8 there for lighting and that, and to get a hundred
9 different people calling on you, trying to sell you
10 something, or giving you this, I have been utilizing
11 what's called "PECI," it's energy smart grocers. They
12 handled all our PG&E site stores, and they will go in
13 and actually go in and moderate before and after we do a
14 project, and they handled all the paperwork, and they're
15 a God send.

16 MS. LEW: Okay. Thank you very much.

17 So we have a few speakers on the phone, and so
18 let's start with Blaine Collison from the US
19 Environmental Protection Agency. Blaine.

20 MR. COLLISON: Hey, thank you very much.
21 Good morning, everybody. My name is Blaine Collison. I
22 am the director of something that's called the Green
23 Power Partnership here at US EPA. I actually sit in
24 Washington, D.C., and the Green Power Partnership is one
25 of our national voluntary climate change programs. We

1 sit in the same piece of EPA as Energy Star, and our
2 mandate is to work with the demand side of the energy
3 equation, so commercial, industrial energy users and
4 help them source renewable energy, or green power, for
5 some or all of their US needs.

6 There's a really interesting mix of stakeholders
7 that is engaged in this marketplace. We have 15 hundred
8 and some odd partners from all shapes and sizes and
9 sectors of the US economy. We have several hundred
10 small businesses. We have the Fortune one, which is
11 Wal-Mart, a green power partner. Intel is the single
12 largest user of green power in the nation. We have
13 dozens of partners in California including a number of
14 our green power communities, particularly in Marin.

15 And I'm here today to talk a little bit about a
16 best practice for onsite solar deployment with
17 commercial and, particularly, institutional audiences
18 that we actually discovered, of course, and I think will
19 surprise no one there, in California. We happened upon
20 a multi-stakeholder PV collaborative procurement in
21 Silicon Valley. We got interested. It seemed like it
22 addressed a number of the barriers that our partners
23 reported all the time, including vender noise, that was
24 just mentioned, is a recurrent issue, technical
25 confusion, bandwidth procurement experience. Long story

1 short, we brought the California model here to the
2 eastern seaboard, and have been deploying it with some
3 stakeholders here and it -- it's striking, the extent to
4 which it seems to be a game changer for, particularly as
5 I say, institutional stakeholders with facility
6 portfolios, particularly large ones. So thinking about
7 cities, school systems, colleges and universities,
8 municipal facilities. Really, really interesting
9 mechanism available to absolutely and utterly transform
10 the scale of what gets pursued, reduce the risk of what
11 gets pursued, add order of magnitude of what moves
12 forward all under simplified procurement processes.
13 It's a -- it's a hard package to beat, and it slots in a
14 compellingly -- in this context, in part, because
15 there's some, some shifting of costs from the back end
16 to the front end, which, as I say, may speak well to
17 some state level of support to facilitate a dramatic
18 expansion of the steadily growing community industry
19 there in California.

20 So that's why I'm here to chat, and I appreciate
21 being invited and having a chance to share what we have
22 discovered in California.

23 MS. LEW: Thank you, Blaine.

24 So let's hear from Camron Gorguinpour from the US
25 Department of Defense.

1 MR. GORGUINPOUR: Hi, how's it going. This
2 is Camron Gorguinpour, here, it was mentioned, with DOD.
3 I actually run DOD's plug-in electric vehicle programs.
4 My job is to design and execute strategies, sell the
5 option of things, that are nontechnical fleet, but as
6 relates to this conversation, I'll focus, I think, a bit
7 more generally on Federal procurement challenges within
8 the Department of Defense.

9 I think that, just to start off, DOD operates on
10 some 30 installations in California alone. So we have
11 Marine Corps, Army, Navy, and Air Force assets all right
12 there, and we're, in large, across all of DOD, we're
13 very into green technologies, but you certainly see that
14 play out in California. Of course, the army's got the
15 new energy basis. You have something like 15, 16
16 megawatts of solar out at China Lake at the new weapons
17 station. As related to my project, Los Angeles Air
18 Force Base is on its way to be the first Federal
19 facility to replace its entire vehicle fleets with
20 electric vehicles. So we certainly have a lot of
21 interest as I have gone around California speaking with
22 station commanders and all service folks who are
23 interested and willing to pursue green technology. Of
24 course, it's also difficult given current budgetary
25 conditions. So I think, generally, what I would -- the

1 general advice I like to give everyone, particularly, I
2 think for small business is get them to use a schedule
3 for products because oftentimes, our facility will pop
4 up and use a schedule but more than that, GSA, itself,
5 operates and reaches out to thousands of Federal
6 facilities. So it's good to be involved with them.
7 Certainly, if there are small businesses working with
8 advanced technologies, get certified as a small business
9 through a small business association. If you can get an
10 AA designation, minority-owned small business,
11 veteran-owned small business, things like that, that
12 certainly helps expedite the procurement process. And
13 folks, again, who work in small businesses should
14 realize that each of the military services is having an
15 entire enterprise around small business procurement. So
16 definitely qualify for that. You could reach out and
17 make sure those folks know who you are and what you're
18 up to.

19 But beyond that, generally, you know, given the
20 serious budgetary constraints that we have had, you
21 know, at the DOD, we look at our different contracting
22 authority and bring in alternative energy. So power
23 purchase agreements, lease agreements, I think probably
24 are pretty good. I mean, to look at our EPIC, our
25 utility energy saving contracts, certainly, we have

1 energy saving performance contracts, so there are these
2 mechanisms that we have to leverage third party, bring
3 large scale energy efficiency projects onto our
4 facilities, and, of course, we're interested in working
5 with DOD developing, sort of, the baseline knowledge of
6 what the different contracts are, are -- is, is
7 absolutely something that other folks should consider.

8 And then I guess, probably lastly, this is a new
9 authority, may be relevant at some point, and our
10 lawyers are actually still trying to proffer exactly
11 what this means, but Congress gave us authority last
12 year that DOD can enter into procurement partnerships
13 with State and local governments for installation
14 services. So anything really energy related and
15 efficiency related, we can enter into direct
16 partnerships, either providing services to or receiving
17 services from State and local governments. So, so
18 there's some opportunities there, you know, even though
19 the budget is what it is. There are definitely
20 opportunities and a lot of interest from DOD just to try
21 to figure out to make things happen. We just have to
22 sort through our perfectly reasonable options.

23 MS. LEW: Okay. Thank you very much, Camron
24 Gorguinpour.

25 So let's start with our first question. I know

1 many of you have already touched on some of the things
2 that you have done in your facilities, but perhaps, you
3 can elaborate in a little bit more detail on some of the
4 things that you have done to advance clean technologies
5 in your facilities.

6 And so, Winifred, would you like to start.

7 MS. KWOFIE: I think what we have done, and
8 my fellow panelists have already talked about it, we
9 have done a lot of lighting technology. We've done
10 lighting, lighting controls. We have done some HVAC
11 controls also in our facility. We continue to look
12 at -- and I want to go back to Randy's point, what makes
13 sense, and that is always a challenge for one
14 institution that is old and medical and patient care.

15 Some of the strategies that we have looked, in
16 terms of procurement, have been trying to find an
17 investor approach to looking at standards or looking at
18 how to use technologies across the campus. So lighting,
19 of course, is the easiest way to play. We started with,
20 initially, you know, we had all these bulbs, which are
21 no longer mentioned. We went to the T8s, and now the
22 new is the LED, and we're looking at and it's very, very
23 challenging, but we have a great procurement group that
24 is working with us to integrate it in a separate way.
25 Usually, when you have an overall change one time, it's

1 very difficult, because lighting is one of the things
2 that are very sensitive to people, and so we have to be
3 very careful how we integrate that. We have tried a
4 bunch of pilot programs working with the California
5 Technology Center on our parking lot. We tried
6 different controls in office spaces to see how people
7 react, and we take down that information, the feedback
8 we get from the staff. We go back to our procurement
9 group and, you know, we look at that information to see
10 what else we need to do to make it work.

11 So we continue to struggle along like everybody
12 else. I think, like Bob said, all these -- all those
13 low-hanging fruits are gone. We have gotten to a point
14 where we have to push the boundary a little bit harder
15 and get ready for a challenge that we face as a campus
16 and it's difficult because you cannot get into certain
17 spaces. The work of our station has been on the campus
18 side looking at classrooms, lecture rooms,
19 administrative offices, clinical or medical office
20 spaces and still struggling to find what technology will
21 actually work for the patient care rooms. So that is
22 our challenge right now.

23 MS. LEW: Thank you.

24 MR. DEGHANI: Well, it's -- as it was
25 mentioned, I think as a public entity, there are number

1 of controls that sometimes become problematic with a
2 project. When we do a project, we have to go through a
3 preplanning effort. We have to go through a programming
4 effort. Once we go through that process, we have to go
5 through a budget approval, and that budget, of course,
6 has to be ranked with other priorities on campus. There
7 is a design team selection process. There is, of
8 course, a design phase, public contracting code to be
9 able to get the low bidder going through a bid and award
10 process, construction, itself, and, of course, the final
11 testing and commissioning and verification by a third
12 party. And then taking acceptance. So when we start a
13 project, although the project may be small, the process,
14 at least a two-year, for example, project. Sometimes,
15 we finish the building just in March 2013. The project
16 programming, it's a large facility. It's 80,000 square
17 feet, a three-story lab. From the start to finish, it
18 was seven years, so you, you look at emerging technology
19 at the time, and by the time you are completing
20 construction, the emerging technology have moved 90
21 steps ahead of you. So you're trying to figure out how
22 you incorporate some of those emerging technologies as
23 you learn through the course of construction, and that,
24 of course, has its own hiccups and challenges with
25 changing and schedule impact and using all of the people

1 on board who want to enter and occupy the facility. So
2 some of those issues that most public entities go
3 through, we have experience as well. However, our
4 campus, we have evaluated a number of different phases
5 for procurement process. We have looked at design bid
6 build and it's traditional. It's -- you know, you hire
7 somebody to go to a better phase. We have looked at CM
8 address, where you contract with the construction
9 management team. They would take the risk. They would
10 be part of the design. They hire contractors with us at
11 the table. There are multi-prime contracting. There
12 are design bid, design build, which seem to be very --
13 more effective, at least, than -- especially the changes
14 that you go through in the construction phase. But the
15 one that we have, it's been really interesting for us on
16 the energy project, has been design build best value,
17 where we select contractors for constructions based on
18 dollars and quality and then various different versions
19 of design build best value modified, they procure
20 something ahead of time.

21 But one of the biggest for emerging technology
22 for us to -- has been that we -- if we have the right
23 people at the table, they are expert in areas and know
24 their stuff. It's been much more effective to make sure
25 that we apply the technology that we're not going to be

1 sorry about and apply the technology that would provide
2 what we looking for. We often do cost analysis to
3 identify if it makes sense. California Value Technology
4 Center on our campus has been extremely helpful with our
5 lighting initiative that started in 2010, and we hope to
6 reduce our lighting by 60 percent. That initiative has
7 been successful so far. We still have a while to go,
8 but it's been very effective working with those teams
9 that know their stuff. So that is what we have done.

10 MS. LEW: Thank you.

11 MS. VANCE: Hi. Christine Vance. In terms
12 of how -- the strategies both at City and County of San
13 Francisco and more recently on a much bigger scale with
14 regional energy network, there's a couple -- I would say
15 two -- primary, big things that we do, is we bring in
16 the expertise that really has the know-how and they --
17 and they're -- and they know the -- all the resources
18 that already exist for the third-party verification,
19 performance information, where it exists, and they are
20 able to, as you say, make those compelling arguments at
21 the right time with the right people, and they're
22 third-party neutral knowledgeable. So that's key, and
23 then we're marrying that with something called a
24 "definite commodity construction contract." So think of
25 it as needed construction. It's still competitive bid,

1 full, very robust construction task catalog with unit
2 pricing, which is more of a capped pricing. So you have
3 a very, you know, a lot of control on price, and
4 virtually, any kind of retrofit can be built up from
5 this catalog, and, again, as I was saying earlier, we
6 spent a lot of time looking at every available advanced
7 technology and getting it into that book. And so what
8 they're -- because you're talking about as-needed
9 construction, it solves a lot of these issues. For one,
10 you've, kind of, done the bidding process up front, and
11 these task orders can move very, very quickly. It
12 allows you to do -- very easily -- do mockups before you
13 use a facility company on a much wider scale. The time
14 it takes to complete the project is much more
15 compressed, so it's easier to take advantage of all the
16 incentives and work through that process. It's
17 incredibly flexible even during construction. If a new
18 technology comes on board that is more applicable, you
19 can easily use that without any kind of price gauging
20 during the change over process. So it has a whole host
21 of advantages for utilizing advanced technologies as
22 well as any technology. There's volume discounts
23 included and, and also, you're talking about minimum
24 qualifications to the contractors, so you can really
25 specify the level of experience these contractors will

1 have. So we're talking about contracts and catalogs
2 that are specifically adopted for energy efficiency.

3 And then I think through a regional energy
4 network setting, then we're making that all available at
5 a mass scale in a collaborative, coordinated fashion
6 with the utilities leveraging all they have to offer and
7 bringing in the financing as well, which is very
8 important because then you're putting the whole package
9 together. So just a few examples of projects right now
10 moving through the regional energy network both at
11 Pomona and Covina, we have identified street lighting
12 projects, lots of wireless technologies, advanced
13 lighting, things that are in compliance with full Title
14 24 coming on board, and we're doing these smart
15 chillers, very advanced, very efficient chillers in
16 Pomona, and we're bringing all those packages together.
17 We're bringing in the, kind of, "slam dunk," the high
18 return, the low return, into one finance package so that
19 we can take advantage of those advanced controls that
20 are doing deep retrofits so that we can take advantage
21 of all that.

22 MS. LEW: Thank you

23 MR. RAYMER: All righty. Bob Raymer with
24 California Building Industry Association. I'll be
25 dealing with building system and advanced techs in

1 question number four, but for right now, I'd like to
2 focus on rooftop solar. For the new residential market,
3 we're bringing in solar rooftop in one of two ways.
4 This is sort of a generalization, but the first way, and
5 certainly growing in popularity, is the use of Power
6 Purchase Agreements, PPAs. This is where a third party
7 entity goes ahead and finances the systems, puts it up
8 on the roof, establishes a contractual relationship with
9 the home owner. All of this, of course, is, obviously,
10 in conjunction with the builder, but the contractual
11 arrangement most commonly is for 20 years. Certainly,
12 there's variations, but it also provides electricity at
13 a rate around 20 percent less of a fee than what the
14 local utility would be charging. That's certainly one
15 of the ways, and that's also the one way that seems to
16 be growing right now. The other way, of course, is the
17 traditional, "here's the solar system on your rooftop."
18 It's purchased just like any portion of the building.
19 The home owner owns it. It's part of the thirty-year
20 mortgage primarily, and both of these are quite popular
21 right now. Procurement for this is usually part of a
22 large volume purchase arrangement and, of course, taking
23 advantage of economies of scales, and so as we used to
24 see solar in 2004, 2005 having a market penetration of
25 less than one percent, we have recently seen where we

1 now have rooftop solar for new residential construction,
2 has a market penetration, depending on the part of the
3 state that ranges from 10 to 15 percent, and I can tell
4 you from being familiar with building systems over the
5 years, that is huge. That is a massive increase in the
6 application of the technology, and while, certainly, the
7 state has a goal of being zero net energy for all new
8 homes by 2020 and certainly 100 percent is a lot bigger
9 number than 10 or 15 percent, there's no discounting the
10 fact that the change that we have seen, the very
11 dynamic, the very fluid change that's happened over the
12 last five years is simply extraordinary. And the basis
13 for that happening, I would have to point to, to the one
14 singular item, and that is actually the CEC's program,
15 the new solar home partnership program, where a
16 relatively healthy incentive is provided for the
17 placement of usually about two to three kilowatts on
18 average on top of the roof. And we have got several of
19 our largest production builders in California that have
20 been taking advantage of that, and so by virtue of doing
21 large scale procurement up front, usually a year to two
22 years in advance of construction, sometimes even further
23 out, but putting the, the incentive money into that sort
24 of Trifecta of financing, we have actually seen sort of
25 a dynamic change where several of our largest builder

1 members are now putting solar on the roof as a standard
2 feature. They have made the switch to simply offering
3 it as a design option, and that's why it was at the one
4 or two percent level of penetration, to where now as a
5 standard feature, for example, KB Home is putting solar
6 on every roof of every southern California project as a
7 standard feature.

8 And so right now, we, you know, we're very
9 appreciative of the new solar home program. Sort of a
10 concern that we have is that right now, there's a
11 healthy balance in that account. My concern in looking
12 forward is that, at the current burn rate, we will
13 probably deplete that account somewhere in the middle of
14 2015. My biggest concern, of course, is that large
15 production builders and medium size builders are making
16 plans two and three years out. And so the question here
17 is the new solar home program will be sunseting in July
18 of 2016. The big question here is, will it have funding
19 between June of 2015 and July of 2016. And at the
20 current burn rate, will we have that funding. The
21 problem here, as I mentioned in my opening comments, is
22 we're experiencing -- in a very nice way -- we're
23 experiencing a huge uptick in residential construction.
24 2013 was the first year where we saw a significant spike
25 in construction. We, just last week, updated our

1 numbers. Instead of having 60,000 multi-family and
2 single-family units built in 2013, the final number is
3 83,000. That is a big uptick, and we anticipate seeing
4 a further increase in 2014 and 2015. So consequently,
5 assuming that you're going to have the current burn rate
6 for application of solar is probably not a good
7 assumption. We're going to have an increased burn rate,
8 and so there is a very good chance we're going to run
9 out of that funding. And, of course, these larger
10 companies that are looking to solar as a standard
11 feature are going to be wondering, will that financing,
12 that additional incentive money, be there about two
13 years down the road. If there's not, they've got
14 several choices. Well, can they find something else to
15 fill the gap; can they reduce the size of the system;
16 any number of things. But quite frankly, they're making
17 those decision today. So to the extent that somehow
18 there can be some sort of a certainty of the program
19 being available is one thing.

20 I realize that, of course, the CEC, in their
21 original EPIC investment plan, has suggested that a \$25
22 million allotment for 2013, 2014 be made. The PUC
23 rejected that and said that the CSI fund would be a more
24 appropriate place for that money to come from and that
25 they will consider that. The problem here is it's a far

1 cry from "consider" to budgeting, and so the question is
2 a real one. Will that money be around down the road,
3 and more importantly, will it be available to the small
4 and medium size builders. And so that's one of the
5 things we're seeking. Maybe EPIC is not the best place
6 to get that from, but we would prefer that we at least
7 have some level of certainty. Right now you've got a
8 huge solar snowball rolling down the mountain. It's
9 picking up steam and it's picking up size. If all of a
10 sudden that program is sort of yanked out a year ahead
11 of schedule, that kind of sends a red flag -- who are
12 procuring product and coming up with design. So we're
13 in this sort of emphases, and we're seeing a staggering
14 increase in the application of solar.

15 So with that, one of the things that we'll be
16 suggesting to the CEC formally is that as a backdrop
17 that they consider once again putting in a request for
18 funding. We'll certainly be promoting and supporting
19 CSI funding for this, but it might be nice to have EPIC
20 as a backdrop to that.

21 MS. LEW: So, Randy, do you have anything
22 else to add?

23 MR. WALTHERS: Well, I just hope Bob's
24 future is true on new homes, because with new homes, we
25 can build new stores. Basically, on the solar issue

1 with new stores, what we are doing is on our existing
2 stores, I agree with Bob. We do a PPA on most of our
3 stores because of the cost involved in it. It's, you
4 know, 25-year contact. What we use on our stores,
5 though, is, on our rate structure for commercial
6 building, we have peak loads and high peak loads.
7 Basically, we can only shave off in the high peak loads
8 in solar. It makes it very economical for commercial
9 accounts at a grocery store because we're 24/7 as far as
10 energy use. And so when we start shaving off that peak
11 load, our energy use, actually our energy cost is almost
12 one-third of what it would have been, and that's where
13 it's very beneficial to us.

14 We also -- if you know, a grocery store, it's
15 probably not a normal building envelope as energy usage.
16 55 percent of our energy is in the refrigeration system
17 in the store. You know, an average store, you know, you
18 look at it, it's about \$25,000 a month cost, and what we
19 have done through the years, is the energy efficient in
20 refrigeration system, and that's where we have cut most
21 of our costs down, by energy efficiency motors, VFCs.
22 Our condenser on the roof, we went to oversize water
23 condenser. Well, in the last couple of years, we figure
24 that water is going to be a high commodity. We have
25 been switching over to a dual -- we invented a dual

1 condenser, where it takes water and air cooled. The
2 only thing with air cooled, during the summer time in
3 the Valley here, it's very high energy usage. So we
4 have to bring in the water to keep the cost down that
5 way. We are still moving forward with the dual
6 condenser, and then as far as energy efficiency on the
7 lighting, I mean, we're basically state of the art. I
8 hear people still trying to switch over from T12. I
9 mean, we have done that, you know, 15 years ago as most
10 of the industry. You know, we are fully web-based in
11 all our stores. From my phone, I can turn off or on any
12 store when have an alert from the Cal ISO, which we just
13 did last night again. And we can reduce our energy in
14 the stores at any one time, and so that really helps us
15 out as far as getting payback from Cal ISO and demand
16 response programs to help pay for that but also help put
17 in the state of the art controls in our stores.

18 The other part is our 20 percent. That is the
19 other, and that's basically what runs our front end and
20 all of our computers, and that's the part where we're
21 looking at fuel cells. Right now we have to put
22 generation systems in to do a backup because of the
23 energy power concerns, and these fuel cells will take
24 and run 24/7, all time, on, right now, natural gas. And
25 they're -- the outcome is just water, you know, steam.

1 And we get a full hundred percent payback on our energy,
2 and it reduces our cost and overhead building of the
3 store or the gem set.

4 What Ardie said, though, of the other parts of
5 where we're saving money is on our waste and disposal,
6 we are looking at a new disposal system in our store. I
7 have a couple test sites that we're combining all our
8 garbage on site transported to Clean World site over in
9 dispose site. They have, right now, a digester making
10 menthane gas for cogeneration but also to fuel all their
11 trucks. And that's something that we're going to look
12 at in probably about another five years if we have
13 enough storage online that we'll have our own digester
14 system on our DC plants.

15 So that's all I have, and I'll be waiting for any
16 more questions.

17 MS. LEW: Thank you.

18 So, Blaine, or, Ardie -- sorry. Blaine or
19 Camron, do you have anything else you'd like to add?

20 If not, we can go on to the next question, and
21 the next question was touched by many of the panelists
22 here, where you get contacted by various campuses about
23 new technologies and "Why don't you use our technology
24 in your facility? Try it out." You know, "We have
25 these savings and all these benefits." So how do you go

1 about, kind of, deciding which one of those technologies
2 are the ones that you want to choose? What sort of
3 information or assistance that you might need. I mean,
4 is having technical guides and specification, neutral
5 specifications, helpful? What are some of the things
6 that might be beneficial?

7 MS. KWOFIE: I'll try and answer and talk a
8 little bit about what we have done. Yes, we have looked
9 at the performance specifications and that's -- you
10 know, we're trying, I think, to move away from the
11 prescriptive specification to more of looking at
12 performance to setting up your energy goals for what you
13 want to achieve. And I think we touched on, in our
14 panel, different things, and I think one part that is
15 always critical for us, and I think Ardie talked about
16 it, in terms of when you have public institutions, is
17 the time that it takes when you are going through the
18 whole process of procurement. And so we have tried to,
19 kind of, leapfrog and talk to our sister companies to
20 find out what is being done. We have used the energy
21 center quite a bit to try to understand applications and
22 test some of them on our campuses that have wasted on
23 all these presentation upon presentation that we can
24 best understand them, not listen to the vendor, get all
25 these flyers, have that time. We starting presentation

1 but I haven't done a real touch, you know, demonstration
2 campus.

3 The challenge also that we see is most times, you
4 know, you'll bring in an application, and the people who
5 maintain the application also need to be involved in the
6 selection. So you put in an application and it might
7 work on the campus, it might work the whole process of
8 procurement and operations and training to make it work.
9 We might adopt it and might not work for us, and the
10 reason is because we just miss a step in that. So one
11 thing that a procurement team is doing now is looking
12 into more of a vendor relationship time and going with
13 major distributors and, you know, open up a little bit
14 to give us that opportunity not to be only bombarded but
15 give us a more of customized approach to getting these
16 products integrated and, you know, try it out ourselves.

17 MS. LEW: So I was just wondering if, if
18 another UC Campus had done and installed a particular
19 technology and they were successful, can you use --
20 continue to use their contract to, kind of, get into
21 their services instead of doing your own independent
22 contracting?

23 MS. KWOFIE: I think, at the moment, it's
24 always been an independent contracting. Now, there is a
25 move toward a consolidated contracting for products,

1 agreement for products to actually exploit method of
2 that buyer power, and, you know, I think a lot of the
3 panelists have talked about, you know, if you have that
4 volume, then you can influence the prices, you can get
5 value for the product and also you have more people I
6 think. The question is marketing situations, and for
7 the market to actually have that product, a lot of
8 people should have tried it and it should have worked
9 for them and it should be readily available and simple,
10 simple to -- and cost effective to maintain. And so
11 that's, I think, the new thinking about what a campus is
12 trying to do is moving into that situation, and
13 hopefully, we'll see.

14 MS. LEW: Because it seems like if you could
15 do something like that, you can really reduce the amount
16 of time that it takes to get a project completed and
17 installed. I mean, it wouldn't be the seven-year cycle.

18 MR. RAYMER: And that's the business plan
19 private sector. A success story, basically, gets the
20 ball rolling, and instead of starting from Point A,
21 you're already, sort of, at the end of the line, "Well,
22 we've got something that works. Let's just go ahead and
23 do it again."

24 MS. LEW: Kind of like piggyback type of
25 contracts.

1 MR. RAYMER: Absolutely.

2 MR. DEHGHANI: It's an interesting dilemma,
3 when we talk about, you know, we have an obligation
4 based on public contract codes to make sure that equally
5 talk about different products, and then you focus on a
6 specific product, although, it may be great, but there
7 are others that come through with a similar product that
8 we should consider. So sometimes, when you focus on
9 technology three years ago, today, we have to make
10 adjustment. As Christine mentioned, we also have
11 something called, job worthy contracts, that we use
12 campus -- UC wide -- that have the unit price that we
13 could -- we have tried to implement more of the energy
14 items in it, but one of the interesting parts for us is
15 no matter how we do our timeline, it becomes more
16 problematic than a typical private job. But knowing
17 this incentive and rebates have some certainty that
18 those are available, as Bob mentioned for solar, I think
19 it truly helps us that if we -- when we did our exterior
20 lighting project, there was a program available under
21 CEC, and if it was not for that program, we would not be
22 able to make the life cycle cost analysis work for us.
23 We implemented exterior lighting project based on
24 external financing that would utilize the energy saving
25 dollars that would pay off the loan, and it was a

1 15-year loan, and in order to make the interest work and
2 have adequate maintenance to be able to support those,
3 we have to be less than 1-year payback. And no matter
4 how we did, if it was not for EFA, we would not -- we
5 would not be able to implement our project. So some of
6 these incentives, it's really great to see this program,
7 at least, have a three-year life that you can at least
8 plan and be able to tap into it without sweating if
9 things not going to be available. So for us, it's
10 really important if there are more certain than -- so
11 thank you for making this program three years at least
12 so we have.

13 MS. LEW: Well --

14 MR. WALTHERS: On the retail side of it,
15 though, what we do is, in putting our resources
16 together, there's a company called Top Source. It's out
17 of the east coast, and it's where all of the independent
18 grocers that do not compete with each other go together,
19 and we just had a big meeting, and we put our resources
20 together on really new technologies, who's doing what,
21 where, and we can talk one-on-one without interfering
22 with our own area of what we're selling, and that helps
23 us out a lot, too. So as you're saying, there's other
24 companies out there like a Top Source for grocers, I'm
25 sure there's other industries that have the same type of

1 support out there. We can talk to HEB in Texas or Big
2 Wide back east and what they're doing. They're very
3 energy efficient grocers, and we can pull our ideas
4 together. That's how we, you know, we put in what's new
5 on the market, because they've either tried it or, you
6 know, failed with it, and then we can move forward with
7 it.

8 MS. LEW: So innovative technologies get
9 into the Top Source?

10 MR. WALTHERS: Very much so.

11 MS. LEW: So you have innovative grocers
12 that try new technologies and it works and then it gets
13 in there and then the world sees.

14 MR. WALTHERS: The suppliers come in -- like
15 right now, we're -- the biggest energy saving in grocery
16 stores of where we're moving to now is doors on all our
17 open cases, and, you know, the old produce departments
18 where you have your salad and you go and reach in, now,
19 we have doors on it. And it's saving about, you know,
20 40 percent on our energy right upfront, just putting
21 doors on our cases. Our merchandizers don't like it,
22 because everybody wants to touch everything and they
23 have to open a door now, but people are getting through
24 that, and we're finding that everybody is acceptable to
25 the doors on the cases. Fresh vegetables and meat, they

1 still want to pick up and play with a little bit and
2 stuff like that and the rest of it, and we're using it.
3 And on Top Source, that's where they come in. All the
4 companies would come into us, show us what they're
5 having, what their design is, what the savings is. They
6 would test it, we would all look at it, and then we
7 would all vote together and say, "We like this one."
8 Then we buy it for a year, and that really helps out.
9 So they really bring the top of the line to us, and we
10 have a one-year to two-year contract with whoever we're
11 going to buy with, with what's the energy efficient.

12 MS. LEW: So does Top Source -- also
13 provides pricing?

14 MR. WALTHERS: They help us with pricing,
15 yes.

16 MS. LEW: So you kind of know if you do go
17 out to bid, what the pricing --

18 MR. WALTHERS: Exactly what it's going to
19 be. And it helps us compete with Wal-Marts and
20 everything else. You know, instead of a Raley's, you
21 know, 200 cases in a year, we're buying 25,000 cases
22 like the Wal-Mart is doing. And so all the companies
23 get together and we're buying cases, and so there's
24 incentive for them to do what we want and move forward
25 with it.

1 MS. LEW: That's good.

2 MS. VANCE: Christine Vance. So I actually,
3 kind of, pulled some of the consultants that we have on
4 the program about this. There's a lot here that you can
5 talk about, and what was really interesting is it became
6 very clear that in the area of lighting, there's a
7 whole, a whole variety of things that have occurred,
8 especially in the area of LEDs, and different sources
9 that address a lot of the concerns. There's a lot of
10 needs when you're talking about use of advanced
11 technologies, such as -- like in the case of DOE
12 lighting, LED lighting program, for example, they had a
13 concerted effort of doing field demonstrations, truth in
14 advertising, and whole, whole sets of standards that
15 were adopted at a national level by utilities that
16 become work ethic incentives and standards. And so all,
17 kind of, third party verification, when it came to
18 mechanical, there wasn't as near as much of that the
19 EPIC program to draw on. So -- and a lot of the
20 consultants really end up going on their own experience,
21 where has it been used before, and as much as they can
22 try to find performance data that's third-party
23 verified. But it occurred to me that, that might be an
24 area that the, the, the program could look at in,
25 kind of, filling that gap more on the HVT side of

1 things.

2 The other -- the other thing is listening to all
3 the panelists is there's kind of an interesting --
4 there's so many things that have to come together and it
5 needs to be customized, right, but we also talked about
6 simplified procurement, and so how do you blend those
7 things together? There's the gentleman from EPA that
8 talked about the Silicon Valley renewable procurement,
9 cooperative procurement and so I think part of the
10 solution is to really scale up, is some kind of marrying
11 of those two, where you have -- you're using a lot more
12 of these examples of coming together and organizing to
13 do cooperative, kind of, procurement of one kind or
14 another that's standards based and transparent pricing
15 and getting volume discounts, but sometimes, simplified
16 is not very customized, and as we all know, advanced
17 technology is all about the application and it's
18 terribly customized. So you need
19 Expertise to be really customized. So I think solutions
20 that can do both of those things together, I think, is
21 where, where we need to go. And I think the advantage
22 of something like these regional energy networks or any
23 way in which we can just come together and organize at
24 levels that we have never done and before that's in
25 accord with the challenges that we face, right, we have

1 to come together and organize leverage and have
2 synergies at a much greater scale than we have ever had
3 before to really meet our mission reduction goals. And
4 I think that what the regional energy network can do is
5 it really becomes almost a learning community. You
6 know, we have a -- you know, 19 energy consulting firms
7 are all going to be learning from one another, and we're
8 going to be having more and more data basis of
9 technologies that get implemented and utilized and, and
10 then -- and so it's bringing together, you know, really
11 this feedback loop and all of the -- all the, the
12 contractors and the engineers learning together proper
13 application and how to commission, you know, and really
14 properly install of these measures. So all of those
15 things have to come together so that you're helping to
16 drive good decision-making by building owners with good
17 confidence that these measures are going to perform.

18 MS. LEW: Thank you.

19 MR. MAYER: Bob Raymer with CBIA. I'll
20 focus on new tech needs first, and then I'll get into
21 third party, and I'm going to fly through this, so I
22 will be submitting written comments.

23 MS. LEW: Good. Thank you.

24 MR. RAYMER: In terms of what we're looking
25 for, for new technology, obviously, a long-term

1 certainty, whether it's in a product or a program,
2 long-term certainty is very needed. A case in point on
3 how not to do it, back in the 1990s, there was a very
4 good, successful PG&E energy efficiency program. The
5 utilities, as most of you know, always have programs to
6 provide incentives to go above code. The higher above
7 code you go, the larger the incentive. So they had an
8 excellent program that was implemented. It was supposed
9 to last for about two years. It ran out of money after
10 about eight months. Unfortunately, all of the builders
11 in the area -- particularly in Fresno, Modesto, and
12 Sacramento area -- had made long-term purchase
13 agreements to bring in the products that were going to
14 be partly subsidized by this, and then the program ran
15 out of money. They were left with a couple of issues,
16 either eat the costs or simply revise the design, which
17 is very difficult to do after construction production
18 and housing has commenced. So long-term certainty is
19 the product of the system, clearly, cost-effective,
20 emphasis on "clearly." You have got to be able to
21 market this to the general home buyer, we don't like to
22 tell them that it's going to pay back in 29 to 30 years.
23 Although, that's sort of the calc that's used with the
24 development of the energy rate. The home buying public,
25 as with anybody, wants to know, 'are we going to get our

1 money back.'

2 System and component warranty, by State law, new
3 homes have a warranty of ten years. There are certain
4 aspects of the home where the warranty is shorter, but
5 at a minimum the product has to be operating very well
6 for a long period of time. Can the new product, the
7 technology, be incorporated into existing design, does
8 it require increased labor, or does it require the
9 imposition of labor having new or very specialized
10 skills, and I'll be getting into that under question
11 number four. Will it impact planning and land use
12 considerations. The layouts of the homes, certainly,
13 productive use of solar, will require some rather
14 extensive layouts, and unfortunately, a lot of projects,
15 at least the footprints of these lots, have been laid
16 out now that they're going to get built four or five
17 years down the road, and that presents sort of a
18 challenge.

19 Now, moving into the area of third party
20 independent technologies, testing protocols, best in
21 class, and all that, we do feel that there's a clear
22 need for this, but we also need to be cautious how we
23 incorporate this into the existing construction process.
24 New requirements for testing and certification can
25 certainly help improve quality control, but a process

1 that's implemented too quickly via mandates without an
2 appropriate level of education, training, and industry
3 ramp up can create a huge log jam in the field, and we
4 have seen several examples recently of that.

5 In addition, and whenever possible, emphasis
6 should be placed on enhancing the existing, let's call
7 it, administrative process, as opposed to creating a
8 separate parallel process. Case in point, the State of
9 California right now has 500-plus jurisdictions, cities
10 and counties. Each one of them has either a building
11 department, you know, that does planning land use and,
12 of course, plan check and inspection, or they have their
13 contracting out to this. So to the extent that we can
14 do things that enhance the existing administrative
15 processes out there that can be very productive, it also
16 helps logistics. You're not necessarily looking at one
17 entity to handle fire safety, mechanical plumbing
18 design, and all that and then another entity to look at
19 green building and energy. It would be nice for, at a
20 minimum, to have them, sort of, intertwined. If there
21 are going to be specialties, they need to work in
22 concert with the building department builder, the very
23 established entity, that the state recognized
24 implementing and overseeing the application or state
25 building codes.

1 Now, one that -- I think for, for, for EPIC that,
2 that we would encourage, particularly, for new
3 technologies and enhanced building system is the
4 development of rather thorough and easy to understand
5 scope of work. As with all contracts with
6 subcontractors and contractors in general, the builder,
7 the company, enters into a contractual relationship with
8 subcontractors, and over the last ten years, we have
9 been working with the CEC, particularly, back in the
10 early 2000s, in the development of scope of works for a
11 variety of -- for example, the HVAC contractor,
12 particularly, on how you check duct systems for leakage,
13 et cetera. And so instead of just signing a contract
14 with a plumber, 'here's ten homes. Put in the plumbing,
15 and you get paid.' Okay. It's becoming a more detailed
16 and more itemized sort of listing of, what needs to
17 happen going above and beyond the minimum specs of the
18 building code, which everybody has to follow. What
19 exactly type of a layout -- where does that water
20 heater -- where is it supposed to go as opposed to where
21 did your grandfather and your father teach you to put
22 it. And so having all of this stuff laid out so that
23 the builder can have access to it to plug it into that
24 scope of work so that the subcontractor has a nice, sort
25 of, itemized listing of the things that have got to on,

1 above and beyond getting the final permit check of the
2 building department, having these sub items in there can
3 be very helpful. And as we getting into the stuff that
4 we'll be discussing under question four, this is going
5 to become absolutely imperative to make some of the new
6 building systems work. So with that --

7 MR. WALTHERS: I agree with you, Bob. As
8 far as full scope of work, as far as HVAC for
9 residential. In commercial, it's a little bit different
10 because we're under the AB32 guidelines of refrigerant,
11 and so all our technicians have to have, you know, full
12 education and certified to remove or dispose of or add
13 refrigerant to any systems. We just can't go into a
14 store and change a refrigeration system or something
15 like that and walk away. We have to, you know, monitor,
16 identify, and, kind of, repair when it happens right
17 there. So I can see where he has a big problem over the
18 whole industry of residential. There's no guidelines
19 right now or actually education.

20 As far as the education that I'm looking for when
21 I talk to people that are going to sell me or, you know,
22 are going to try to design something for my builders or
23 -- there's an association of energy engineers out there
24 that has a CEM, and that is the Certified Energy
25 Management license. That gives you a broadcast of

1 everything in the United States, you know, from boiler
2 systems in New York underground to everything else in
3 efficiencies. They also have a different one, which is
4 called the Certified Building Energy, and that's
5 basically for what we would want to use here, is you're
6 a certified energy management of the building and you
7 understand what's in your building before you go out and
8 buy it or procure it, and so you know if it's right or
9 wrong. So there's also a lighting company that's if
10 they don't have a CL license or a CLTC license, I won't
11 talk to the salesman, because all he is someone who took
12 a five-hour course and now he knows it all.

13 So there's certain things that you can look at,
14 you know, in 30 years with Raley's that I have had
15 everybody and their brother try to sell me something
16 around there and you learn who actually took the time to
17 sell you the right product. You know, LEDs came by --
18 this was 15 years ago when I started working with the
19 CLTC, with LED case lightings. You know, we had T8s and
20 T12s in our case lightings, and we went to the first
21 LEDs, and it took us two years, the project working with
22 them, to get the right LED light patterns, the heat
23 patterns, and all that. So now we went from a, you
24 know, 40 watt per foot down to a 14 watt, which the CEC
25 want us to have right now. So that's a huge energy

1 savings that we're seeing. So just things like that and
2 understanding what you're buying.

3 And actually, Bob, you have got so many different
4 people out there, it's hard. We're controlled, because
5 we have an inhouse refrigeration system. We're inhouse
6 on all our designs and learning on LEDs through CLTC.
7 You know, well, they build LEDs in a block 30 by 30.
8 Only the 12 by 12 inside part is utilized by the GEs and
9 the major corporations. All the rest of them are sold
10 to whoever, and that's where you find out that you have
11 degradation to your LEDs faster than normal, and they do
12 not hold up. So there's a lot to learn before you just
13 go out there, add money to who's selling it to you where
14 and -- you know, and education out there.

15 MS. LEW: Okay. Well, thank you.

16 I think we need to move on to question number
17 three.

18 Oh. Oh, so, Blaine or Camron, do you have
19 anything else you'd like to add to information that you
20 think -- information that would help get these
21 technologies out there?

22 MR. COLLISON: I'm all set. Thanks. Go
23 ahead.

24 MS. LEW: Okay.

25 MR. GORGUINPOUR: I was just going to

1 add that -- I'm sorry. Go ahead.

2 MS. LEW: Was that Camron, or was that
3 Blaine?

4 MR. GORGUINPOUR: This is Camron right now.

5 MS. LEW: Okay.

6 MR. GORGUINPOUR: The only thing I was going
7 to add is just that, again, with a lot of our general
8 budget cuts, it got more difficult for our facility
9 energy managers to go to conferences and things that we
10 had normally held to gather information on new
11 technology to bring back. So I definitely think that
12 there's a need for more information on products to get
13 out in an organized way to our -- to our facility
14 managers. So having independent assessments and things
15 like that, I think it would really help.

16 MS. LEW: Okay. Good. So let's move on to
17 question number three about innovative procurement
18 strategies that can help reduce the costs of some of
19 these technologies, and we talked about some of them
20 here, and I was going to see whether Blaine or Camron --
21 because I think your Federal agency talked about GSA,
22 maybe there's something innovative there that can be
23 helpful to others out there.

24 MR. GORGUINPOUR: Sure. This is Camron
25 again. I'll chime in. So, again, my emphasis is

1 largely on vehicles and not so much on the installation
2 of the building side, but in general, yeah. And I think
3 that these new contracting mechanisms for contracting
4 authorities gives us an opportunity to look at new
5 business models, you know, such as partnering with
6 state, local governments to do joint procurements could
7 help leverage some sort of volume. It could ease the
8 procurement process. Oftentimes, companies have a hard
9 time working directly with the Federal government
10 because they have, again, a set government partner,
11 state or local partner, managing that process. Actually
12 these allow smaller ones to participate. So those are
13 our things that we're definitely looking at. But, you
14 know, there's a classic models also like contracts and
15 so forth, but it would take some time. I actually saw a
16 slide today this morning from the Army that mapped out
17 their process for approving a power purchase agreement.
18 And it is -- it's at least a year long to get through
19 and funded, and then once that happens, probably another
20 year to two years to actually get the project
21 implemented. So there's definitely some focus on
22 figuring out the streamlining process.

23 MS. LEW: So, Blaine, do you have anything
24 you'd like to add?

25 MR. COLLISON: Yeah, I think do. This

1 question is pretty much my wheelhouse today, and so let
2 me say a couple words about the Silicon Valley Project
3 and then the DC area project that we have done here and
4 what the key take aways are there, and I will attempt to
5 be brief about it.

6 The key thing that happened in both places is
7 that instead of an institutional energy user being in
8 response mode when a solar vendor comes knocking on
9 their door -- and I think everyone in the room here know
10 that that happens a lot -- and it is functionally
11 deafening for an institution energy manager or
12 sustainability manager facilities director to keep being
13 told to respond to that stream of inquiries and
14 solicitations and to manage it and to wrangle it into
15 some kind of order and deterministic basis for making
16 decisions and implementing a strategy. So the thing
17 that the crew out in Silicon Valley did, we hired a
18 Mountain View based solar consultant, who was, in fact,
19 a technical provider in Silicon Valley. We brought them
20 out here. The thing that we did with our stakeholders
21 including the District of Columbia government and the DC
22 public school system and regional governments throughout
23 the area here was to go to them and say, "Hi, why don't
24 you tell us about your portfolio of buildings and
25 facilities. Take this spreadsheet that has 15 fields of

1 potential data that we'd like to see. You guys are the
2 world's greatest experts on your own facilities. Blue
3 sky it for us. Just give as much data as you can, as
4 quickly as you can about any facility, any site within
5 your portfolio that you think might work for solar.
6 Be -- error on the side of inclusion here," right. We
7 will then take that data, and we're going to do a couple
8 different passes of triage on it. We're going to do an
9 initial look, Google Earth and shading concerns. We're
10 looking at age of rooftops. And we're going to take a
11 site that has a stand of old grove forest or a giant
12 parking garage in front of it, and chuck it immediately.
13 And we're going to take the facility that has a
14 two-year-old rooftop on it -- or excuse me -- probably a
15 17-year-old roof that's going to be replaced in three
16 years, and we're going to chuck that immediately. And
17 we can do that very, very quickly. And then we're going
18 to do some much more detailed site studies, and after a
19 couple of rounds, we're actually going to wind up
20 sending someone out with a camera and a sun meter and a
21 pencil and a clipboard, and we're going to walk around
22 the facilities that really look good. The net result of
23 all this is that when we -- when we got folks through
24 this process, what they had was a package of sites that
25 were, were absolutely, completely ready for projects,

1 right. And so they headed for the RFP process, not with
2 a sense of possibilities that was based on vendors
3 whispering optimistic things in their ears but the
4 result of some top-flight technical analysis. They knew
5 what was possible. There have been some economic
6 studies done. They knew what was sort of the ballpark
7 set of possibilities with some benchmarks there.
8 Vendors are able to come to this set of sites knowing
9 that there's no garbage in there they won't have to
10 price risk into their proposals to account for the
11 possibility that someone has been really, really sloppy,
12 which we see a lot and has thrown in some sites under a
13 broad RFP that are absolutely nonstarters. So folks are
14 able to approach this in a much better posture to offer
15 best price bids. The terms and conditions of the
16 proposal and the bids are standardized, right, so there
17 are apples to apples comparisons. They're available
18 from the get-go.

19 One of the -- you know, one of the anecdotes that
20 comes out that I love most and is perhaps as good as any
21 at capturing the set of issues here is I sat down with
22 the CFO of a community college in Maryland here a while
23 back. He had 25 years of corporate finance under his
24 belt. He's in a state with very favorable solar
25 policies. He had a supportive administration. His

1 institution wanted solar. He had a large,
2 uncomplicated, uncompromised, unshaded ground mount
3 opportunity across the road from his office. He had
4 site control, and he said, "you know, look," he showed
5 me the stack. He had a stack of proposals, unsolicited
6 solar proposals from vendors that had to be three, three
7 and a half inches thick. He said, "Look. I'm a finance
8 guy, and I don't quite understand what's in here.
9 They're all in different terms. They're not comparable.
10 It's going to take us a year to go through and, sort of,
11 get a handle on what's in here. We haven't seen
12 contracts like these before, so we've got to figure that
13 part out. By the time we get all that done, all the
14 numbers are going to be stale. So we're going to have
15 to go back to all these guys and have them refresh their
16 bids. Oh, by the way, I have got a ton of other things
17 on my plate to do. So I could tackle this piece, which
18 is looking like, frankly, a giant hairball, or I could
19 let it sit until I get around to it," and, in fact, it
20 was going to sit until he got around to it.

21 We hear this set of problems over and over again
22 and I -- what was amazing in this collaborative
23 procurement process was to see, see the actual shoulders
24 relax on facility energy managers that have been tasked
25 to go figure out a solar play when we came in and said,

1 "Hi. We're going to help you figure out a solution.
2 We're going to give you non-vendor access to topflight
3 technical and economic insight before you go have to
4 interface with the supply side. We're going to get
5 you -- get you brought up-to-speed here on what's really
6 possible across your facility's portfolio and what you
7 can expect, what you're shooting for. This model has
8 found increased dissemination, a number of geographic
9 pockets across the US, because it is so potentially
10 transformative. It's -- there's some dramatic expansion
11 in a couple of pockets in California. The EPA region 9
12 office in San Francisco has taken this as a result of a
13 series of conversations that we have had together.
14 They're trying to help some of the Federal facilities in
15 San Francisco access this procurement pathway to get
16 something done there. The place where this interfaces
17 with the broader issue today is that there is,
18 obviously, upfront costs, right. We sent solar
19 engineers both at their desks to do Google Earth
20 analyses and then out to walk around parking garages in
21 Montgomery County, Maryland, right, to take
22 measurements. The costs are generally, ballpark, you
23 know, somewhere in the neighborhood of maybe \$2,000 per
24 site. It is absolutely, utterly transformative, and it
25 is money that's incredibly well spent. It's hard for a

1 facility manager to go up their chain and say, "Hi. I
2 need to spend a couple grand per site to find out if we
3 can do anything or what it is that we can do. And you
4 know, I don't know what answers we're going to get
5 back." Right. That's a much tougher internal sales
6 pitch, marketing pitch than, "Oh, yeah. We're going to
7 sign a PPA, and it will be great." But to get to a PPA,
8 in fact, to get more sites to better PPAs faster and
9 open at lower costs for end users and rate payers in
10 California, this approach has almost unbounded promise.

11 And I can stop there. I'm happy to talk to
12 folks subsequently, but I don't want to monopolize the
13 time here for other panelists.

14 MS. LEW: That's really good.

15 And so do any of our panelists have anything else
16 you'd like to add to it?

17 MS. KWOFIE: I was going to say, thank you,
18 Blaine, for sharing that, because that's some of the
19 issues that Dave and I have been working on at UCSF is,
20 is trying to go a route where it makes sense. So you're
21 talking about a school. In our facility, we have about
22 five million square foot, and we have a lot of
23 researchers very sensitive to research, very sensitive
24 to the air space. And one thing that I was telling Dave
25 right now was a couple of days ago is how do we make

1 procurement manageable for a researcher? There's a lot
2 of risk. There's a lot of risk going there and just
3 touching and realizing the HVAC. And so one approach
4 that we're looking at is trying to actually go and take
5 that burden off them, which is exactly that same process
6 that Blaine talked about, trying to go to them,
7 understand their needs, because if you understand their
8 needs, if you understand why they want certain lights
9 on, why they want certain air flows, the reason for --
10 you're able to bring your technical group together, to
11 the table, to analyze it because these people are
12 people -- they want data. They want you to draw it on
13 the table to explain to them clearly where you're going
14 to do and how that will not impact their process or it
15 wouldn't impact their research or, you know, those kind
16 of discussions.

17 And we had a lot of success in that sense where
18 they are now approaching us. We just got a solicitation
19 from a group that say, "We need to do this procurement
20 and how can you help us," and that never used to happen.
21 You know, we needed -- we always were going out to them,
22 became the vendors people didn't like, you know, trying
23 to say, you know, sustainability, and the tools that we
24 have to use and it's important. And they did not like
25 that story, but when we went in and tried to understand,

1 bring the technical people to them, let them do their
2 analysis and to show to them clearly, you know, what is
3 the -- what are the areas, why are they not doing it,
4 and understand it and work with them, you know, they
5 turned it around. And they are now calling us now to
6 help them. So I'm glad that, you know, you get to share
7 this with us, and I'm sure I'm one of the people who
8 will be following up with you to expand this.

9 MS. LEW: So I think we're going to move on
10 to the next question. And so what are some of the
11 potential activities that can help facilitate the
12 inclusion of emerging technologies into a subdivision,
13 design, or a building design, or part of a retrofit
14 renovation type process. Bob.

15 MR. RAYMER: Would love to understand that.
16 Bob Raymer, CBIA. You know, in general, there's sort of
17 three areas here of things that can be done, basic
18 research, pilot programs, you know, field application,
19 and, of course, one-on-one design systems. And the
20 one-on-one is not something that's -- it translates very
21 well in production housing and for most projects, you've
22 got five or six model options. You may have a rather
23 infinite number of design options. I can tweak those,
24 but in large part, you usually have got five to six
25 models, and so to the extent that one-on-one design

1 assistance can be provided is great. But as I'm looking
2 into specific areas of need here, having just gone
3 through the latest update of energy efficiency
4 standards, this is the stuff that will take effect in
5 July of this year, and looking forward to the next two
6 updates, the provisions that will take effect in January
7 of 2017 and January of 2020, there's a couple of new
8 construction systems that are going to be promoted
9 heavily by the CEC staff. I know this because they
10 attempted to get it in this series of the mandates, and
11 so we're already well aware that coming down the road,
12 particularly for 2017, they're going to be looking at
13 roof deck insulation, advanced wall system assemblies,
14 further reductions in air infiltration, advanced
15 plumbing system design for, for hot water supply, and so
16 I'd like to, kind of, take those on very quickly in a
17 singular fashion.

18 Advanced wall system assemblies. Going back to
19 the late 1940s, residential construction is largely 2x4
20 wood construction with these studs 16 inch on center.
21 Now, to get a more -- a deeper cavity for, for wall
22 insulation, the Energy Commission would like us to move
23 to 2x6, 2x8, or a staggered system where we go 2x6 every
24 other stud or 2x4 so that you can have a rather deep
25 layer of insulation going into that, and quite frankly,

1 this can be done. Engineering wise, this can be done,
2 but once again, getting to my opening comments, we have
3 to take this from the drawing board, we have to take
4 this from the handful of examples that are going on out
5 there and mass produce this in a way so that the
6 subcontractors and the designers, in particular, can get
7 this on to the blueprint so the building officials can
8 understand that this is how the window is going to fit
9 into this new deeper wall cavity; this is how the door
10 is going to fit into this deeper wall cavity. There's a
11 lot that can be done. EPIC can help do basic research.
12 More importantly, EPIC can help with pilot programs and
13 help with one-on-one design.

14 In terms of roof deck insulation, this is not to
15 be confused with putting ceiling -- or putting
16 insulation, a layer of R30, over your ceiling. This is
17 where the roof deck itself, the sloped part of the roof,
18 has either insulation on the exterior of the plywood or
19 on the immediate interior between your roof deck studs
20 of the joists, and in particular, this has some problems
21 with it. We have to bring the manufacturers
22 up-to-speed, particularly the roof covering
23 manufacturers, so that they don't void their warranties.
24 As we were looking at the last go around of the
25 standards, Energy Commission was proposing putting

1 either, I believe, was R8 on the exterior of the roof
2 deck or R12 on the immediate interior of the roof deck.
3 Putting it on the interior creates some moisture issues.
4 These can be solved, but we have to figure out the best
5 way to do it and then mass apply it. We have had some
6 catastrophic failure on the east coast by trying to do
7 this on the under side, and then putting it on the
8 exterior of the roof deck, you end up having what looks
9 like an ice cream sandwich on the exterior of the roof.
10 It can be done, but we're going to have continual roof
11 penetrations, the vents, the openings for the whole
12 house fan, all of this needs to be understood from a
13 design perspective and from a mass application
14 perspective so that our contractors can get this done.
15 Another challenge that we don't really talk about much
16 here, but is certainly clear out in the field, over half
17 of our framing crews, our carpenters, do not have
18 English as their primary language, and when we were
19 producing fall protection guidebooks, whatever, about
20 ten years ago, we produced 10,000 in English and 10,000
21 in Spanish. The 10,000 in Spanish went very quickly. I
22 still got some of the English ones if you'd like that.
23 Get them out of my office.

24 But looking to some of the other things, further
25 reductions in air infiltration. That's a given, but

1 we've got to make sure that we're going to go below
2 where we are right now, which is already a very tight
3 envelope, are we creating an indoor air quality issue.
4 This is something that's a great concern to CBIA. It's
5 something that's a concern to the Air Resources Board,
6 and if we are not careful, we're going to set the stage
7 for mass class action suits down the road. So to the
8 extent that research can focus on that, would be great.

9 Advanced plumbing system design for water supply.
10 There's a lot of good concepts out there. What we need
11 to do is come up with some, probably, a nice little
12 booklet of the application of this, so that the typical
13 plumber can understand, this is what you're doing now,
14 this is where you would like to go in the future. As
15 opposed to having an energy consultant try to tell the
16 plumber how to do his job. That's not going work in the
17 field. Plumbers, 'my dad taught me to do this. His
18 grandfather taught him how do that,' and the guy with
19 the calculator and the Ipad, that's just not going to
20 cut it with the plumber, and so we got to figure out a
21 tactful way to try to get them to alter how they have
22 been doing it for 40 years. Easier said than done.

23 A few last things in terms of the clean
24 technology. We, during the last update of the
25 standards, have finally brought compliance credit into

1 the regulations for the application of solar. In seven
2 of our climate zones, you can now get some type of
3 energy efficiency compliant credit for solar. It's a
4 very limited credit, and it doesn't apply across the
5 state. What we're looking for is very robust credit for
6 all sixteen climate zones, and if you put four kilowatts
7 on the roof, you should be getting twice the credit of
8 two kilowatt. Obviously, the benefit varies from
9 climate zone to climate zone, but there's research to
10 get that in, and that's where you're going to make the
11 change in the market for the small and medium size
12 builders who may not be able to take advantage of the
13 economy of scale procurement, but if they can find a
14 very productive way to bring this into compliance with
15 the energy efficiency standards, it's going to sell
16 itself.

17 And so anyway, like I said, I'll be turning in
18 written comments, but that's my comments for today.

19 MS. LEW: Okay. Thank you. So we just have
20 a couple more minutes before the open period. So our
21 panelists can make brief --

22 MS. VANCE: I just wanted to -- this is
23 Chris Vance with the Energy Coalition. I just wanted
24 to, kind of, piggyback on what Blaine was saying.
25 Everything he said, he had some really key points about

1 bringing the right expertise and through and doing the
2 cooperative procurement and just -- but that is so
3 powerful. And I think we need to apply energy
4 efficiency as well and not just to solar and really
5 doing the -- just removing that duplicative process that
6 all agencies or business may have to go through, and
7 just doing it once for everybody, that's very powerful.

8 And then a little bit back to question three, I
9 just wanted to mention that I think there's also
10 tremendous opportunity at reducing the pricing through
11 the buying power, of course. And we saw that, of
12 course, even at spec with just launching the program.
13 We don't really have the volume yet. We just got
14 started, but when we went back to some of the
15 manufacturers, for example, Kree, they said, "We think
16 this is going to be a big program." They reduced their
17 price on LED lights for student lighting by 48 percent.

18 So I think there's -- you know, as we move
19 forward I think, you know, I feel like the regional
20 energy networks are really trying to be that living,
21 kind of, laboratory in bringing all those examples from
22 the Silicon Valley solar procurement into the energy
23 efficiency. So that's my --

24 MS. LEW: Any other quick comments?

25 MS. KWOFIE: I think one thing that I -- and

1 it may be it goes back to the same thing that Dave said
2 is proactive design guide plan, which is what I would
3 call it simplify, simplify, simplify. Make it easy for
4 training. Make it easy for bringing the people. Just
5 like Bob said, you also need people to understand,
6 because you can't change the way they done it that works
7 for them. So making it simple so that it's not
8 complicated controls with all these designs that they
9 cannot operate would be such a big deal especially for
10 institutions, public institutions.

11 MS. VANCE: And that portfolio approach as
12 well. Similar to what we're doing is we're providing a
13 whole portfolio market to service providers and they're
14 only responding to one RFP and they're being now, you
15 know, deferred to the market essentially efficiently.

16 MS. LEW: Okay. Okay. So let's move on to
17 the public portion of our workshop here, and so we're
18 going to open it up first to comments in the room, and
19 did any of you fill out a blue card, or if you'd like to
20 make a comment, you can provide us with your business
21 card and tell us what area that you would like to
22 discuss, and please come up to the podium here, because
23 everything is being recorded.

24 Okay. You can raise your hand if you'd like a
25 blue card.

1 Okay. So I have Mr. Walter Horsting from BDI for
2 Terrestrial Energy and Light Systems.

3 MR. HORSTING: Yes. Couple of quick
4 questions for Blaine at the EPA. Is there any program
5 going on in the country for flare gas recovery versus
6 flare gas being emitted directly into the atmosphere
7 either -- being burned or the methane being released. I
8 was hoping to get some direction on that.

9 Regarding the US Department of Defense, Camron, I
10 was wondering in you're global based deployment, are you
11 looking at molten salt reactors for base electrical
12 supply in terms of something very compact and mobile.

13 And for Raley's, I was wondering if your fleet is
14 going into a natural gas mode and whether it could be
15 looking at a source of fuel such as Naphtha to burn.

16 MR. WALTHERS: As far as Raley's, we had
17 natural gas trucks. Basically, a lot of our trucks go
18 over the mountains, and natural gas is not powerful
19 enough right now, the engines weren't, when we did this
20 five years ago. We are now looking at natural gas with
21 the digester system coming up. I know Atlas Waste
22 Disposal are using all natural gas now, and the new
23 trucks out are powerful enough to haul what they have to
24 haul. That's what we're looking at now.

25 MR. HORSTING: I might have something to

1 bring to you.

2 MR. WALTHERS: Okay.

3 MR. HORSTING: I'll sit for a response.

4 MS. LEW: Okay. Blaine or Camron.

5 MR. GORGUINPOUR: This is Camron. I'm
6 sorry. You know what, when you were asking the
7 question, the sound cut out right when you were talking
8 about asking what specific type of technology. What
9 were you asking about?

10 MS. LEW: It was molten salt storage.

11 MR. HORSTING: No, no, no. That was for
12 Blaine. I'm sorry. This is Walter Horsting. The
13 question was on flare gas recovery. There's around 6
14 trillion units of natural gas that are going into the
15 atmosphere globally yearly, and I was wondering if
16 there's any programs to -- funding for programs to be --
17 going after capture of that flare gas. I have a process
18 that I'm advocating for that.

19 MR. CAMRON: Yeah. I'm not aware of
20 anything specifically on that, though, it wouldn't
21 surprise me if, on our R&D front, we have projects. We
22 have funded a lot of different projects to look at just
23 about every way at capturing energy from anything. So
24 it wouldn't surprise me if we did have something, but
25 I'm not, offhand, familiar with anything specifically.

1 MR. HORSTING: I would --

2 MR. BLAINE: This is Blaine at EPA. Our
3 natural gas work is a little off my range. We do have a
4 natural gas startup program. We do have a methane
5 recovery program. I would encourage you to have a look
6 there and reach out to those staffers. They may be able
7 to direct you.

8 MR. HORSTING: Thank you.

9 MS. LEW: And so the other question had to
10 do with molten salt reactors for the US Department of
11 Defense, that was your other question, correct?

12 MR. GORGUINPOUR: Oh, okay. Yeah. I'm
13 sorry. This is Camron again. I'm not -- that's one I
14 haven't heard of, but if you want some information, I'd
15 be happy to pass it around to see if anybody knows it.

16 MS. LEW: Okay. So are there any other
17 questions in the audience?

18 If not, then we'll go to the phones.

19 Is there anybody on the phone?

20 So there's nobody else on the phone.

21 Any comments?

22 MR. RAYMER: I didn't want to monopolize the
23 time with the question four, but there were two other
24 issues. Plug load, innovation on plug load strategies.
25 The Energy Commission has been keeping rather good track

1 of our envelope energies related to heating air
2 conditioning and water heating, and they have estimated
3 that about 50, 55 percent of the energy used by the
4 average home right now, the new home, is plug-load
5 related. Either appliances that aren't directly related
6 by the -- or impacted by the energy efficiency standards
7 or all of this stuff that we're plugging in. And to the
8 extent that EPIC could help either do research or have
9 actual application pilot programs on how to get a handle
10 on this in a massive scale and that would be very good,
11 and it would be very helpful as we approach 2020. The
12 whole idea of getting the solar system that goes on your
13 roof that gets us to zero net energy, to keep that cost
14 down, you need it as small as possible obviously for
15 design consideration and economic considerations, and to
16 the extent that we can get a handle on that half of the
17 electricity used in the home, that's going to plug load,
18 that could be enormously helpful.

19 Lastly, marketable prescriptive packages. As
20 most of you are aware, the various packages that have
21 been developed for the climate zones for the last 30
22 years are, in large part, rarely used. That's where
23 computer performance analysis is based upon. Cal BO,
24 the Building Officials from the state and CBIA have,
25 sort of, renewed interest now in the development of

1 marketable prescriptive packages, one that includes
2 solar, one that doesn't include. So that particularly
3 small and medium size builders can have access to a
4 compliance approach that doesn't necessarily involve the
5 hiring of an energy consultant. And once, again, the
6 building officials would love that because all of a
7 sudden inspection and plan check becomes a lot easier.
8 So there's two other ideas that we'd like to bring.
9 Thank you.

10 MS. KWOFIE: And I think one, Bob, that I
11 wanted to -- is I think you had most working on the new
12 homes. I think there needs to be some sort of
13 development on the old homes, too, because that is a
14 concern that I would like to see a lot of research go in
15 trying to help in different ways, helping them also
16 through that.

17 MR. RAYMER: Yeah, this afternoon, I think
18 the third segment of today's -- on permitting and
19 that -- I'll be coming back for some comments on the
20 retrofit market and some issues we have run into, but
21 perhaps some ways that EPIC could help maybe make things
22 work a lot quicker and easier.

23 MS. LEW: Okay. That sounds very good.

24 MR. DEGHANI: I had just a couple of items.

25 MS. LEW: Sure. Sure.

1 MR. DEHGHANI: Me, we love emerging
2 technology. We have many on our campus and -- that he
3 was talking about the heat recovery from fuel gas. We
4 have a large condenser project on our campus that
5 provides heating for 3,000 students for free. This was
6 recently finished in 2012. It would be great if any of
7 you wanted to see. We have a geo-therm solar PV chill
8 beam, underslung heating, cooling, radiant heating,
9 cooling. Multiple energy recovery systems, natural
10 ventilation. We have a group of folks called Energy
11 Efficiency Center on our campus. California Lighting
12 Technology Center, cooling energy, energy conservation
13 office, the student body sustainability office, campus
14 sustainability office. So we would love to hear from
15 you. If you have ideas that you think it would be
16 interesting for us to consider, we appreciate if you
17 give us a ring.

18 MS. LEW: Thanks.

19 MS. KWOFIE: May I add something. I think
20 the new president, Janet Napolitano, said that she's
21 going to change to the institution to actually move
22 research, and she's looking at, looking at research in a
23 different way. Especially energy and in water. So I
24 think that this would be a nice place to start that
25 research and have you all visit so we can change the

1 world.

2 MS. LEW: Thank you.

3 So anybody, any other panelists would like to
4 have any other closing remarks?

5 Okay. Okay. Okay. If -- any last chance for
6 comments from either in the audience or online. Last
7 call.

8 So I'd like to thank all of our panelists for
9 participating in our workshop today. Really appreciate
10 you coming and sharing your insights with us, and I also
11 want to thank the audience and the participants on the
12 WebEx for also listening in and participating as well.
13 And so if you have any other comments that you think
14 about after this workshop is over, you still have a
15 chance to submit them in writing, Pam had -- and so that
16 information is on the handout and the PowerPoint that
17 Pam provided earlier.

18 And so if there's nothing else, I'd like to
19 conclude this workshop -- this panel -- the first panel
20 portion of this workshop. And we're going to be taking
21 a lunch break, and it's about 12:04 right now. We'll
22 probably start around --

23 MS. DOUGHMAN: We'll be back around 1:15.

24 MS. LEW: Thank you very much.

25

1 (Break taken.)

2

3 MS. DOUGHMAN: Okay. We'd like to get
4 started with our second panel. Eric Stokes will be the
5 moderator.

6 MR. STOKES: Okay. Thanks, Pam.

7 My name is Eric Stokes. I'll be the moderator
8 for the second half of the day's workshop, which will
9 focus on ways the Energy Commission through the EPIC
10 program can help facilitate the commercial success of
11 good energy technologies and the companies and
12 entrepreneurs developing them.

13 We have a great panel today. We're going to
14 share some of their insights, ideas, experience around
15 what they see is really needed to help accelerate the
16 path to market for clean energy technologies for clean
17 energy technologies.

18 Unfortunately, today, one of our panelists wasn't
19 able to make it. She had something come up last minute,
20 but it will be great to hear from the rest of the panel.
21 The format for this panel will be the same as this
22 morning. Each panelist will have up to five minutes to
23 make some opening comments, and then we'll dive into the
24 questions on the agenda, which will then be followed by
25 public comments and questions.

1 And so with that, we'll go ahead and get started.
2 First up is Beverly Alexander with the Energy Institute
3 at HAAS at UC Berkeley.

4 MS. ALEXANDER: Thank you. Good morning --
5 or good afternoon. In the quick to market program, we
6 work with innovations coming out of the Department of
7 Energy labs, the California Energy Commission funding,
8 as well as a variety of different labs across UC
9 Berkeley and startups outside of Berkeley. And the
10 biggest gap that we have been focusing on is what we
11 call the lab to license gap, where you have some really
12 some interesting technologies, some interesting results
13 in the lab, but the researchers don't have the time, the
14 funding, or even the inclination or the background to do
15 a really solid market deep dive on the technology. So
16 if you -- for those of you who happen to have the
17 slides, you'll look, most people talk about the valley
18 of death, where you don't have enough revenue to cover
19 your costs when you're already started, but we're seeing
20 a pretty significant valley of death long before that in
21 terms of even getting someone to license the technology
22 coming out of labs.

23 We see a second problem, which is a lot of people
24 working in clean tech are mission driven rather than
25 business driven, and so they want to participate in a

1 mission around an end state, you know, smart grid or
2 biofuel or something, and so they're thinking way down
3 the line often into these heavily occupied commodity
4 markets where people have been playing for a hundred
5 years. And so there isn't a sense of how you half find
6 your way into commercial success through those markets,
7 and it's almost never jumping straight to the ultimate
8 commodity market. You almost always have to take a
9 stepping stone path along the way. And so we find
10 that -- if we can -- if there's a predictable set of
11 mistakes that we can correct to our analysis and it
12 means being relentless about competitive value,
13 realistic about a product development cycle, and highly
14 selective in terms of your finding a winnable first
15 target market.

16 So the way that we assess this gap and these
17 tendencies to make these mistakes is that we have
18 leveraged the HAAS innovation curriculum. We're
19 entering our sixth year, so we have a five-year track
20 record that HAAS has put a stake in the ground around
21 innovation, and then we bring together teams of graduate
22 students from 20 different programs across UC Berkeley
23 and we apply that curriculum to a 42-factor, business
24 factor, check list, where we just go very wide and then
25 very deep on what may be the most promising commercially

1 winnable target markets and then -- and then articulate
2 a path towards the ultimate market with a very rigorous
3 product to market fit analysis, and we have done this
4 across the entire carbon chain.

5 I think we're on to the next -- the following --
6 the next slide.

7 We've done this across the entire carbon cycle.
8 Lawrence Berkeley Lab has put an issues in place called
9 Carbon Cycle Two that would not only change -- look at
10 what -- where all the different things we can do. It
11 would be low carbon on the demand side, the supply side,
12 high tech, low tech, and clean tech market to all of
13 these and apply this approach to all of these, and we
14 actually had about a 20 percent success rate, year over
15 year, regardless of domain and sector, using this kind
16 of approach around business rigger combined with
17 creativity and design thinking. So we think it's a
18 pretty useful approach.

19 And so we have -- if you can go to the next
20 slide -- we have had, what people are calling, a steady
21 stream of success with 20 percent incorporation, 15
22 million in investments, grants, awards, and revenue. 47
23 percent continuing RD&D but this time, in a more
24 commercially viable direction, and with that, we have
25 had about 20 million in funding, 12 percent licensing, 9

1 percent are still part of the Department of Energy
2 research hub, and 12 have actually redirected their
3 research finding that we found that there were fatal
4 flaws in that something was just simply never going to
5 become commercially viable in that direction that they
6 were able to tweak it, and now they have got a much
7 better direction that I can tell war stories on that.

8 Also, job creation. We've created 60 brand new
9 jobs and placed people in about a hundred existing jobs
10 that are focused and dedicated on energy technology.

11 So we're excited about both understanding these
12 gaps better and are finding really concrete ways to
13 address them.

14 MR. STOKES: Thanks, Beverley.

15 Our next panelist is George Crandall with
16 Technicon.

17 MR. CRANDALL: Thank you, Eric.

18 Technicon is a nonprofit company located in the
19 Sacramento area that has focused on renewable energy
20 over the last five years. We've created something
21 called the renewable energy testing center, and its goal
22 is to support emerging technologies on a little larger
23 scale than what Beverly's program is about. What we
24 really do is we have a program that allows people to put
25 pilot technologies of a fairly large scale at an

1 industrial location where they can have their equipment
2 demonstrated -- first, maybe developed -- then
3 demonstrated then tested and validated for performance.
4 This program has been funded by the US Army under a
5 program to transfer technologies to army bases. Due to
6 congressional issue in the last year that kind of fell
7 apart, we still have two technologies, two gas fire
8 companies, located at the McClellan site, which is close
9 to here, and we have had to relocate ourselves to a
10 smaller facility for testing. But we have -- we're
11 basically -- retained all the assets that allows us to
12 continue a program along like this. The, the really
13 core areas that we work on have been waste energy, waste
14 to fuel, biomass to fuels, algae production, gas
15 cleaning technologies. We have not got into -- or
16 geothermal. There's some things that each testing
17 center needs to have a focus on. We see ourselves as a
18 commercialization accelerator for these companies. We
19 have had a pretty good success rate -- and next slide,
20 Pam.

21 We've actually tested five gas -- five gasifiers
22 at -- three of them at our facility to offsite. We made
23 liquid fuel, diesel fuel in our site and tested other
24 technologies offsite. During that five years, we've
25 operated -- we managed to help companies get \$35 million

1 in grants, mostly federal, some state. Of the 11
2 companies using our services, some of them right now are
3 selling equipment. Wouldn't call it completely
4 commercial but they're attempting to sell equipment.
5 Some of them have -- most of them have sold equipment,
6 though. Examples of those, Pacific Renewable Fuels got
7 a grant under REII from the Federal Government, built a
8 \$19 million facility in Toledo, Ohio based on the
9 results from the testing that we did on our shop on
10 their pilot system. They have now split up and formed
11 two companies, one with the Toledo base for biomass to
12 power, and the second one they're calling Gray Rock, and
13 that's focused on natural gas and diesel fuel. So
14 they're off and running. They have got big players,
15 like Exxo, investing in them right now. So that has
16 been a big success. Sierra Energy is a small gas fire
17 company out in Davis. They have got an Army contract
18 that they got through ours. Waste at about 20 tons per
19 day to power. We have to Cha Corporation still at our
20 facility. They're doing gas cleaning technologies, and
21 they have contracts with Boeing and the Air Force.
22 Advanced Plasma Power, interesting company located in
23 UK. Actually got to take a whole crew over for a week.
24 That was tough duty. They're selling units for a 300
25 ton per day for MSW power. Peat International is

1 focusing on medical waste. They're successfully selling
2 units, and we have a couple pyrolysis that are selling
3 units presently, mostly at the 40 ton per day rate.

4 So the program really is about bringing people
5 through the valley of death and out of the fog in
6 Beverly's curve there, they have got the business plan
7 together, they have got the people. They need -- they
8 just are looking for a site to demonstrate the
9 equipment. The process that we go through will take
10 some refinement under the EPIC program if we get that
11 far, but essentially, we make the companies supply their
12 own equipment at their own expense. The testing
13 facility, the people, the development are all covered by
14 the program. It gets them to the point that investors
15 can come in, kick the tires, see what's going on, and
16 it's really a unique steppingstone that all these
17 companies in this space really need.

18 So that's my comments. Thank you.

19 MR. STOKES: Thanks, George.

20 Our next panelist is Jen Garson with the US
21 Department of Energy.

22 MS. GARSON: Hi, thank you for having me
23 today. So my name is Jennifer Garson. I work from --
24 at the Office of Energy Efficiency and Renewable Energy,
25 text market within the US Department of Energy. Over

1 the last two years, a lot of our focus has been on early
2 stage commercialization, and we have launched several
3 programs focusing on this areas. Our first largest one,
4 with the \$5 million program we launched called the
5 Innovation Ecosystems Initiative. This was really
6 focused on creating regional partnership to incentivize
7 service to commercialize their technology. We funded
8 five different regions across the county, including one
9 in California through the University of California San
10 Diego, and we have seen some really great returns on
11 that initial program. A lot of their programs were
12 focused on tech demonstration and validation and
13 supporting entrepreneurs and creating mentorship
14 networks. Our organizations have worked with about 60
15 different startups with a followup on funding that's
16 \$110 million over the last three years so creating about
17 a twenty to one return on investment for us.

18 Additionally, I manage our National Clean Energy
19 Business Plan Competition. This was a program we set up
20 through the Obama Administration startup America
21 initiative focusing on creating opportunities for
22 student entrepreneurs to commercialize clean energy
23 technology. We have had about 600 teams apply over the
24 last two years. We're heading into our third year.
25 This has been an opportunity really for students to have

1 an opportunity to bring their technology concepts and
2 apply business acumen to really come up with a business
3 proposition and that can, kind of -- several levels of
4 judging. And out of that, we have also seen some great
5 successes about startups and with about a \$25 million in
6 follow on funding.

7 Additionally, I worked within business networks
8 on the on state screen challenge program. This was an
9 initiative launch with the US Department of Commerce,
10 the US Environmental Protection Agency, and the US
11 Department of Energy, among others, and this is really
12 looking at proof of concept centers. So developing
13 testing centers across the country where we could focus
14 on commercial clean energy technology. And most
15 recently, we actually put out a request for information
16 this past fall where we really looked at trying to
17 address the gap that actually, I suggest a little bit
18 earlier, where we're having some off take research
19 technology and create a business from it. So this is
20 pre-deployment innovation stage, and a lot of what we
21 heard from was the need for technical assistance and
22 technical demonstration, mentorship and support
23 incubators. So we just recently announced an incubator
24 initiative for upward funding where we're going to fund
25 three to five individual incubators across the country.

1 It's a national organization to help support the
2 coordination of clean energy incubators across the
3 country. So a lot of our work really focuses on how do
4 we take all of the really great technology ideas and IT
5 that's been developed at both our national labs and
6 universities and help facilitate it's entry into the
7 market. So I'm looking forward to today's conversation
8 and for any questions that you might have.

9 MR. STOKES: Okay. Thanks, Jen.

10 Our next panelist is Josh Gould with ARPA-E at
11 the US Department of Energy.

12 MR. GOULD: Great. Thanks, Eric. Thanks
13 for you and the whole California Energy Commission for
14 having us here today.

15 So ARPA-E is the early stage applied research arm
16 of the Department of Energy. We fund high impact energy
17 technologies that are too early for private sector
18 investment. So more specifically, we fund applied
19 research across the energy, the spectrum as long as it
20 can have a transformational impact in one of three
21 areas, so that's reducing energy related emissions,
22 improving energy security, or improving energy
23 efficiency. So in addition to our mission, ARPA-E is a
24 little bit unique in that it actually has a
25 congressional mandate to prepare technologies for an

1 eventual transfer from the lab to the market. It's
2 actually with Congress has asked us to it in setting up
3 our agency. So we spend a lot of time and dedicate a
4 lot of resources to assist ARPA-E or these, what we
5 call, reformers, here, in doing that transition from lab
6 to the market. One of those resources that we provide
7 is, what we call, a technology to market team here at
8 ARPA-E of which I'm a part. And so, you know, because
9 we have such a diversity of technologies and teams who
10 come from -- everywhere from national labs to
11 universities to even R&D groups of large companies. We
12 also realize that every project team that we work with
13 has its own vision for how to reach commercialization.
14 So whether that means spinning out a company, raising
15 venture money and licensing technology, you know,
16 working within the context of a large company, we're
17 entirely okay with that. We're agnostic as to the
18 approach to how folks commercialize. We don't endorse a
19 single strategy, and so what we try to do is help teams
20 in constructing and carrying out their plans. In
21 particular, try to provide them the knowledge and skills
22 to carry out their objectives, you know, which also
23 helps our agency carry out our own congressional
24 mandates to make sure that these things get
25 commercialized.

1 Just a fitting topic for ARPA-E, because that's
2 what I spent every day thinking about, sometimes on the
3 weekends too and thinking about what helps energy
4 entrepreneurs to bring these products to market. Also
5 want to mention that we have a memorandum of
6 understanding with the CEC, our agency does. So that's
7 also intended to help both of our organizations achieve
8 our shared objective of bringing over funding to market.
9 So look forward to the conversation this afternoon.

10 MR. STOKES: Okay. Thanks, Josh.

11 Our last panelist today is Cole Hershkowitz with
12 Chai Energy.

13 MR. HERSHKOWITEZ: Can you guys hear me all
14 right?

15 MR. STOKES: Yeah, we can hear you fine.

16 MR. HERSHKOWITEZ: Yeah. Awesome. All
17 right. Cool. I wasn't sure. No, but yeah, so I'm Cole
18 Hershkowitz. Thank you guys, and thank you, Eric and
19 Pamela, for putting this on. I run a small startup
20 company down here in southern California called Chai
21 Energy. We're a pre-revenue company, and what we do is
22 we take smart meter data from the 40 billion smart
23 meters across the country, and we kind of crunch those
24 numbers and figure out exactly where homeowners can save
25 on their utility bill and what's going on in their home.

1 So my perspective is very much through the lens of a low
2 capital, direct-to-consumer, low sales force; it's more
3 of a marketing play. And we have, kind of -- through
4 our inception -- about a year and a half ago, we have
5 gotten a lot of support through programs that things
6 like EPIC would support in particular the western region
7 called flow of the DOE clean energy business plan
8 competition, which Jennifer mentioned and also the Los
9 Angeles -- so I'm not going to talk about pre-valley of
10 death and what gets people and students and graduate
11 students excited about and interested in starting
12 companies in the clean energy states. So I think we
13 have already talked about how you coddle and help, and
14 once they get into that space, how do you get more smart
15 people to want to start companies? And I think it
16 really comes down to three or four things.

17 So the first of the three things is motivation.
18 You need to motivate people. You need to show them that
19 there's something to do here. The second is
20 inspiration. Inspiring people with stories of
21 successful clean energy ventures is a great way to get
22 entrepreneurs excited about what they're doing. I think
23 it's one of the three or four core things you need in
24 someone's job is passion and inspiration. And the last
25 is community, which provides you a number of things but

1 including, kind of, advice, mentorship, guidance, and
2 knowledge around starting companies.

3 So -- let's see. So I think -- I talked about
4 community first. You need to really create communities
5 within schools and outside of schools, because founders
6 need to meet each other. Founders need to meet adviser
7 and mentors to provide them, kind of, the knowledge and
8 insight they need and the connections they need to
9 succeed the connections to things like the Energy
10 Commission and other organizations in California.

11 Motivation. People aren't going to do things
12 unless they really have a reason to do it. So how do
13 you motivate people. Well, through our own devices. If
14 you don't ever see successful stories or stories of
15 successful clean tech energy companies, I think we would
16 all just work at big companies. So showing people what
17 a startup can become is very important and that kind of
18 goes to communication as well.

19 And lastly is inspiration. People need ideas.
20 There needs to be a cross pollination between
21 disciplines of ideas so you can borrow things from the
22 financing industry to start something like the solar or
23 borrow ideas from battery technology in order to start
24 something else.

25 And then the fourth thing, which isn't part of

1 the first three, but it's the next part of the puzzle of
2 getting entrepreneurs excited, is creating a knowledge
3 base around startups. I think, in particular, the tech
4 industry, which I followed for a while has done a really
5 good job of doing this; the clean energy lacks has not.
6 Particularly, there are websites online with tons of
7 knowledge and information about starting technology
8 companies. So there are millions of, like, clean
9 energy -- that, kind of, core knowledge base that's
10 publicly available online.

11 And then we're going to talk a little bit about
12 how we got that in our growth in the past. So we
13 participated in the clean energy business plan
14 competition out west here called Flow, and that really
15 inspired students through speakers and events, just
16 telling their stories. It provided motivation for
17 people. So \$100,000 first prize motivated, I think,
18 well over 50 student teams to apply. It created an
19 ongoing community of relationships through various
20 events they would hold, and lastly, through advisors,
21 they provided knowledge to the students who didn't
22 really know anything about startups. And the second
23 thing is the incubator they were part of, the Los Angeles
24 clean tech incubator, which provides an even more tight
25 knit community of advisors that are willing to help you

1 through and give you advice from their experience at
2 whim and that, kind of, leads to the knowledge as well.
3 So yeah, that's what I had to say on it.

4 MR. STOKES: Okay. Thanks, Cole.

5 I think we'll start with the questions, and the
6 first question is at what key services such as testing
7 centers, independent validation are needed to help clean
8 energy entrepreneurs successfully commercialize good
9 innovations. The second piece of this question is what
10 technology development stages are these key services
11 needed and how should the Energy Commission -- how
12 should the Energy Commission prioritize the top two --
13 top few technical areas that companies should receive
14 services. And I think we'll start with the panelists in
15 the room and then go to the those participating
16 remotely.

17 MS. ALEXANDER: Yeah, and I know that a
18 couple of people have more knowledge than I do about
19 this but I have had -- we have had about 40 projects go
20 through our program, and from watching them, what's
21 really struck me, it's very hard to predict what kind of
22 testing equipment they will need. So for example, one
23 of our first startups was a printable battery, and they
24 needed the best printing equipment ever. We never would
25 have predicted that, starting that program, equipment

1 would be so critical to their success. So the
2 philosophy that I've come to believe is that the CEC can
3 do to promote a really wide range of user agreements for
4 a huge range of technologies -- you'll never be able to
5 design a tech space that has all the equipment. By
6 definition, innovation is about breaking new ground, so
7 you're never going to be able to forecast exactly what
8 testing equipment they'll need but if a wide variety of
9 equipment is made available on -- whether it's nights or
10 weekends or something, private, public, any of the
11 public equipment -- I think that would be really helpful
12 for the space. So that's just from observing what our
13 people have needed. They have needed wildly different
14 kinds of equipment and you can't -- you really can't
15 predict when there's an advance. So --

16 MR. CRANDALL: Well, what we found is
17 that -- this is George Crandall -- was that people would
18 come to us nationwide looking for support on putting a
19 technology at some location that was really heavily
20 industrial. They could get them a permit in California,
21 and that's one of our standard models is we permit every
22 technology we bring in before they actually run so that
23 the ability to have a testing site that, like Beverly
24 said, has a variety of equipment that they would
25 otherwise have to purchase if they built their own

1 facility was a major attraction. I mean, a complete
2 laboratory with GCs, mass specs, synthesis gas emission
3 measurement technology, for exhaust gases. All that
4 equipment, all those services at one location really
5 brings these companies a relief in the amount of money
6 they have to spend. It gets them a kick start having a
7 whole, complete machine shop, air compressors, power,
8 all these things that you would otherwise have to put
9 together for you own individual test site. Being in one
10 location reduces the cost hopefully for the Government
11 as well as for the developer, entrepreneurs. So that's
12 one thing we see on the key services area.

13 I'll pass on that.

14 MR. STOKES: Okay. Jen or Josh, do you guys
15 have anything to add to this question?

16 MR. GOULD: Yeah, this is Josh from ARPA-E.
17 You know, I think one thing we can see from the
18 responses is that, you know, one, the type and stage and
19 funding amount necessary for testing and validation is
20 going to vary depending on the industry that the
21 technology is target to but, two, into almost every
22 case, particularly if you're doing, you know, really
23 innovative, early stage, technical work, you are, at
24 some point, going to need to address testing and
25 validation and have the resources available to do that

1 if you're serious about getting whatever you're working
2 on in the market. And so one of the ways that we try to
3 address this at ARPA-E is we ask folks to write up a
4 technology department plan, which is essentially what is
5 your approach for getting this technology to market and
6 as one of the components of that plan, we ask them to
7 think about exactly what they're going to need for
8 testing and validation and, you know, think about what
9 roughly it's going to cost, and related to that, how,
10 how you're going to be able to obtain those resources.
11 So we ask -- and that's something we ask for as they
12 begin a project with us, and we've found it's helpful to
13 start thinking about that at the beginning because of
14 the difficulty in obtaining the resources necessary to
15 do that. And so, you know, we think it's -- I -- you
16 know, the appropriate strategy is for folks to think
17 about it early and often but I think, you know, as an
18 agency, we're aware of being overly prescriptive as
19 whatever the resources needed for testing the validation
20 are going to be highly industry and technology
21 dependent. And so, you know, one way to look at or
22 think about tradeoffs between industries is to ask
23 folks, you know, to think about what the testing
24 facility would typically cost and how much choice there
25 is in testing and validation providers, you know, who

1 are trusted by the industry because that's another
2 important component, and in doing that, you know, it
3 doesn't mandate that a federal or a state agency
4 necessarily be the expert on all things testing the
5 validation but rather to have teams who are innovating
6 in this space begin to gain the knowledge and skills and
7 resources necessary to understand exactly what's
8 necessary to get technology to market in terms of
9 testing and validation. So I think -- I think it's good
10 that we're talking about this and thinking about this,
11 but I think it's going to be highly industry dependent,
12 and I think having teams who are working with the CEC or
13 working with other agencies that bear some of the burden
14 and at least think about it not necessarily having the
15 resources but at least thinking about it early, that's
16 been beneficial for us.

17 MR. STOKES: Thanks, Josh.

18 MS. GARSON: This is Jennifer Garson. I
19 agree with Josh. I mean, you know, one of the things I
20 wanted to say here is that testing and demonstration is
21 obviously a really important component for the risk
22 technologies before they can be potentially investment
23 ready. So, you know, we've worked with contract labs
24 and with our national labs on doing some prototyping
25 testing. For example, we've worked with the Fraunhofer

1 Institute in Massachusetts, and they've worked with
2 startups on doing testing and valuation to provide, sort
3 of, a third-party validation that the technology
4 proposition that they have -- they proposed really is
5 confirmable and outside of the labs but one of the
6 important things that you need to couple with this
7 testing and validation is market validation. You know,
8 if we just contain it to validate, the technical
9 capabilities of the technology, sometimes, some of these
10 entrepreneurs may lose track of who their end customer
11 is. So when setting up testing and demonstration sites,
12 there really needs to be buy in as well from industry
13 players saying, you know, 'this is something that we
14 would actually like to purchase at the end.' So -- and
15 it's really important for entrepreneurs to begin
16 engaging with customers at the beginning point as well,
17 making sure that what they're trying to validate is
18 actually going to be picked by an industry.

19 MR. STOKES: Okay. Cole, do you have
20 anything else to add to this question?

21 Okay. We'll move on to the next question.
22 Second question, what activities, tools, or information
23 are needed by the financial community to help facilitate
24 investments in the early stage of clean energy
25 technology. What role can the Energy Commission play in

1 facilitating this through the market facilitation
2 program.

3 MS. ALEXANDER: So one of the reasons we
4 structure our analysis the way we do is that the
5 investors we talk to absolutely need to see a winnable
6 first market. They have got to see that you can get
7 revenue coming in as soon as possible, that you're going
8 to beat the competition, and that you can actually get
9 revenue coming in over costs at some point. But that's
10 not enough. They have got to see growth markets, and so
11 that sense of a winnable first, a growth market where
12 you're going to get the revenue and the customers in
13 very, very large numbers, and then some path between
14 those. So they can't be disconnected. They don't have
15 to be identical. They can be different as long as
16 there's a logical next step and a logical path, and so
17 that's why we structure our analysis the way we do and
18 why we talk so much about paths to market. And, and
19 like I said, with these commodity markets, you're --
20 often we're working with -- just to give you an example
21 an electric chromic window. Beautiful technology and
22 they were discouraged because the price point wasn't
23 even close to a commercial building, but that was their
24 ultimate market. And then we helped them find interim
25 markets such as satellites and greenhouses and other

1 things where they could still develop the same
2 technology but they would be using -- producing smaller
3 volumes at higher price points to actually just get a
4 beach head somewhere. And so we have also noted that
5 oftentimes that can be in the military. We had one year
6 where virtually every project we had was -- the first
7 market was looking like a military application. So we
8 joked that we were clean tech to military that year.
9 But I think that, you know, we have seen that a lot of
10 these small volume, high price markets do often end up
11 being military markets. So I just think investors have
12 to see that, and I know you may be thinking of other
13 kinds of tools from their own end, but I wanted to lay
14 that out as a first perspective.

15 MR. CRANDALL: I think the groups that we're
16 dealing with are always at risk because the data the
17 investment world is looking for, the readiness levels
18 six, seven, eight, and most of those are in the middle
19 were they do not know if this technology will scale.
20 They really do not know the total environmental impact,
21 and so what Beverly's program does, we really don't try
22 to do, but we see the problem. A lot of them come in
23 with no real economic sense of where they're at. They
24 know their technology will do this to that, and it's the
25 greatest technology in the world, and that's where they

1 get hung up. So testing and validation and incubation
2 is important to work through those issues before state
3 and Federal money is expended on a great scientific
4 experiment and not really a reality of being an
5 investment grade technology.

6 What the Energy Commission can do is try to
7 figure out a method of sorting through these
8 technologies that they wish to invest in and putting
9 them through programs like we're talking about in an
10 orderly manner to promote success. We're not, at the
11 stage we were at, capable of doing complete market
12 analysis of these technologies. Truthfully, we were
13 getting Federal money. We were looking at the end
14 market being the military. We knew what they wanted.
15 We really didn't care if it would be an investment that
16 the utility companies would be interested or fuel
17 companies would be interested. The military's economics
18 are different, but to move into the commercial stage, we
19 need a priority system developed.

20 MR. STOKES: Okay. And anyone online like
21 to weigh in on this question?

22 MR. GOULD: Josh, ARPA-E. You know, I think
23 we can probably broadly generalize investors, kind of,
24 look at three things when you're investing in a company
25 or a technology is broadly grouped into team market and

1 product. And I think the Commission can have a positive
2 impact in each of them. You know, as it relates to
3 team, we at ARPA-E, do our best to try to provide
4 performers, many of whom often tend to be really
5 technical, with some basic coaching and knowledge on how
6 business folks and investors view the world. So, you
7 know, it's -- a lot of it, frankly, is just asking
8 questions, which would -- you know, to give you a couple
9 of examples, be things like, why is talking to potential
10 customers important, why is that important in the
11 beginning of a technical effort versus towards the end,
12 you know, how can you quantify or create a cost
13 performance model that describes your valued
14 proposition. Do you understand what the competition is
15 in the market and how you're doing any different -- what
16 you're doing is any different or better than what's out
17 there. And then based on the answers to all those
18 questions, you know, how might you try to help a team
19 fill in any gaps in their knowledge or experience. And,
20 you know, and I think those, those gaps reveal
21 themselves when we ask questions like that.

22 You know, as it relates to the market, I think
23 the Commission has a very relevant mission in terms of
24 trying to solve big problems and trying to do -- trying
25 to take on issues and challenges, which could be

1 transformational and, you know, oftentimes, not always
2 but certainly that can lead to transformational returns
3 for an investor if you're talking about a big, difficult
4 sticky market. So there's, there's, there's some work
5 that can be done there but, you know, it also helps to
6 do when we -- at least at ARPA-E, when we pitch a
7 program or pitch an area, and I think the commission
8 does this to some extent as well, that itself requires
9 some deep market insight and some, some market research.
10 So sharing that with our performers after we have done
11 it really can give folks a head start on understanding a
12 market.

13 And then, you know, the idea that Beverly
14 mentioned around product market fit, I think is always
15 really relevant and a lot of that is, frankly, just
16 going out and talking to the customers. We see with
17 early stage technologies that oftentimes there are a
18 variety of different first markets, like Beverly
19 mentioned, and it's really understanding, Okay. What
20 components of your products do you really need to
21 optimize for that need to be ground-breaking or best in
22 class, and which other ones might just be what, in poker
23 terminology, you could call table stakes or good enough,
24 and that is a really ambiguous, difficult process that
25 you really only get by going out and trying to talk to

1 customers.

2 And so I think in wrapping all this together, we
3 have a summit or a get together in late February where
4 we showcase all our technologies, and so an event like
5 this that we're all talking about right now, you know,
6 the discussion that we're having right now, I think it's
7 a good start, and it might be worth the Commission
8 thinking about, you know, how they can convene a group
9 of like minded folks and investors together to look at
10 technologies, that's the plan of our summit and trying
11 to equip our performers with the skills and experiences
12 necessary that once they actually get to that event, you
13 know, that they can make something of it. So, you know,
14 in addition to those resources and in addition to
15 thinking about how, how we help performers address those
16 three categories I think also just the -- one of the
17 advantages of government is the power of convening, and
18 I think having the Commission think about how it might
19 use the power of convening folks to the advantage of its
20 performers is a worthwhile exercise as well.

21 MS. GARSON: This is Jennifer. I understand
22 what he's saying but there are -- there are a lot of
23 different mechanisms that we have seen that help de-risk
24 companies before talking to investors, and one of them
25 is going through customer identification such as the

1 National Science Foundation, I-Corps model or of the
2 launchpad model or going through business competitions
3 where they have actually -- the teams, themselves, have
4 been vetted and have a better understanding of their
5 market and it's -- it, sort of -- it de-risks this for
6 the companies to customers in a more informal setting
7 before they actually have to go out and do their races.
8 It allows them to have a better understanding of what
9 their market is.

10 Additionally, like what our ARPA-E said at their
11 summit, one of the things that I have heard a lot from
12 utilities and energy companies is that they feel there
13 aren't as many opportunities for them to really have an
14 opportunity to engage with startups at summit or at, you
15 know, competitions, and they really wish there were more
16 formalized settings where they can actually meet
17 companies that potentially could fit their technology
18 needs, and one of the ways that you could even craft
19 those kinds of meetings is to create a consortium of
20 energy companies, utilities and other customers to talk
21 about what are their areas of need and serve as
22 matchmaking between, say, startups that are working in
23 incubators and accelerators across the state and help
24 to, kind of, play that, facilitating matchmaking role.

25 Additionally, in terms in financial incentives,

1 another thing that we heard a lot recently is the
2 whole first mover incentive. So how do you create an
3 incentive for energy companies and utilities to adopt
4 early stage technology. A lot of them are very
5 risk-averse. They want to make sure that they're in
6 compliance with all of the regulations and not that you
7 break but what kind of an incentive could you set up to
8 make these large customers, like utilities, really want
9 to adopt at this early stage technology once they have
10 been through some tech demonstration and validation.
11 You know, a lot of states have talked about this, but
12 there really hasn't been a good model of that out there,
13 and I think that it can really be a good opportunity for
14 this commission.

15 MR. STOKES: Okay. Any followup?

16 MR. HERSHKOWITZ: This is Cole here. I
17 wanted to really agree with what Josh was saying about
18 giving startups the information, knowledge they need.
19 There's, kind of, low tech solution there, which is
20 making available free online but this also connecting to
21 startups and mentors who can answer more specific
22 questions.

23 And in building on that -- actually, not building
24 on that, completely separate, helping startups pilot
25 their technology and programs but not in a subsidized

1 way. So helping startups by, perhaps, paying for the
2 research that goes around a pilot that then helps the
3 startup show numbers and metrics and, kind of, product
4 market fit that they need to show investors. Because if
5 you show investors that the government just paid for a
6 pilot or did a pilot program for them, it doesn't bode
7 well unless they actually have a customer while they're
8 into that who's willing, excited, and happy about paying
9 for it, paying for the product because of that.

10 MR. STOKES: Okay. So I think with that,
11 we'll go on to the third question. What role can
12 innovative strategies such as design gaming, social
13 gaming, and other in reference to adoption and emerging
14 energy technology and strategies, what technology or
15 strategies would be best suited for these approaches.
16 Is there a current funding gap not adequately covered by
17 the private sector.

18 Beverly.

19 MS. ALEXANDER: I'd like to talk about one
20 version. I know there are many kinds of design
21 thinking, so one is the Apple where you make it so cool
22 that people want to buy it, but there's another kind of
23 design thinking that is taught at Haas, which is that
24 you stand back and take all your blinders off and get
25 very clear and very factual about what actually it

1 exactly is that you have in your hand, and then get
2 creative in thinking about what the uses of that might
3 be. And so we have used that a lot in finding these
4 first markets, creative first markets. And so for
5 example, fuel cells, Lawrence Berkeley Labs has spent 15
6 years developing a very rugged variety of fuel cells,
7 and the company was formed to try to use this in cook
8 stove applications, charge cellphones and developing
9 nations. So it's a very cool market. Very cool idea.
10 They were funded by very reputable investors, some of
11 the best in Silicon Valley, and it turns out, that
12 market was turning out to be a hard market to get
13 revenues over cost very quickly, and so they came to us
14 to ask us to apply this, kind of, design thinking to
15 what might it be developed in a developed world market
16 market. And so that team, they stood back. They looked
17 very, very objectively at every feature of this thing,
18 and they spent months and about six weeks of just
19 wracking their brains about what might work for this,
20 and the very features that made it useful for cook
21 stoves made it potentially applicable in national gas
22 fracking sites that are way off grid and can't use the
23 electric schematics to track emissions, and so this was
24 something that wasn't even remotely on the radar screen
25 for the company, and they found out that it had the

1 potential to be a double bottom line investment where
2 you could provide additional process and significantly
3 either reduce or eliminate fugitive emission from
4 fracking sites. So that kind of design thinking is just
5 really taking the blinders off and going very, very wide
6 and very, very creative, but we have found that thought
7 process, because the teams struggle with it for a while
8 and the companies struggle with it, because it's working
9 way outside their preconceptions, but it has helped us
10 in, I would say, 60 percent of our projects find really
11 interesting target markets that nobody had thought of or
12 come up with before, but again, I know there's a lot
13 more, so I just wanted to take comments on it.

14 MR. CRANDALL: This is George. When we see
15 our people, they really have a fixed idea of what their
16 market is. It may be wrong -- I just talked about but
17 the one -- the one thing that's problematic with a lot
18 of these technologies really is customer adoption like
19 this talks about because there's not enough support
20 either environmentally or public relations wise about
21 those kind of technologies, and this also gets not in my
22 backyard area where we need to engage the public more in
23 the advantages of these technologies and why they should
24 adopt them in their neighborhoods, areas, et cetera. So
25 that's my comment.

1 MR. STOKES: Okay. Anyone on line want to
2 weigh in?

3 MR. GOULD: This is Josh. Just one quick
4 tidbit that we raised is we engaged some crowd sourcing,
5 you know, some professional kind of crowd sourcing
6 entities, and we found that to be effective but only
7 effective in certain use cases specifically where you've
8 got a challenge that's really well defined, you know, "I
9 need an electrolyte like this," "I need an energy
10 density of X," even more narrowly defined than that.
11 And, you know, we have worked with groups that have done
12 a very good job of sending out a technical, a very
13 specific technical challenge to their networks, and have
14 been pleasantly surprised at the results. So I'm not
15 sure to what extent that's relevant to the commission.
16 It may be more relevant to the funding that utilities
17 distribute, but we have found crowd sourcing mechanisms
18 to be very effective when what you're sourcing is very
19 well defined.

20 MR. STOKES: Thanks, Josh. Anyone else want
21 to follow up with that?

22 MS. GARSON: This is Jennifer. We received
23 a lot of this integration of design thinking in social
24 gaming primarily in the software platform for engaging
25 consumers and it's how you -- you not only, you know,

1 make consumers use technology but make them want to. So
2 it goes along with what was said earlier, the Apple
3 thing. The reason why, say, you know net has been so
4 successful for some consumers is that they want
5 something that looks pretty, but, you know, secondarily,
6 there's been a trend toward bringing in social
7 scientists when trying to do promote strategy plans that
8 you have more of a customer adoption side of technology
9 plan not just technological milestones but understanding
10 what makes people want to adopt technologies, you know,
11 how the Clean Energy Commission could utilize that, and
12 maybe it means bringing on more social sciences in
13 looking at all of these matters and -- but it's a
14 complicated space. But, you know, it's -- we have
15 definitely seen this emergence of trying to make
16 platforms that consumers engage with more user friendly
17 and something that makes them want to engage, which is
18 why a lot of the gamers have been brought on recently
19 with software platform designers.

20 MR. HERSHKOWITZ: Cole here. I was just
21 quickly going to say that, you know, in Chai Energy, we
22 deeply believe in an idea of social gaming and design
23 thinking and building products for customers, but I
24 think Jennifer's right in that a lot of these ideas come
25 into play in software programs or software technologies,

1 which means there's not really a funding gap as you
2 proposed but rather perhaps the knowledge, understanding
3 an age gap, because the people that we try to sell to,
4 at least in part, are utility companies, who are, kind
5 of, used to deploying new infrastructure, new product,
6 new energy sources on a forty-plus cost to year time
7 cycle, and they just don't understand the fundamental
8 idea of the AT&T U-Verse is constantly being referenced
9 to customers feedback, and there's a big disconnect in
10 the utility companies really being an infrastructure
11 company that builds forty-plus year infrastructure and
12 their customers wanting things something new every year,
13 like a new Iphone, you know, your new computer, and this
14 mismatch and kind of time crisis that I think is the
15 real problem not a funding problem.

16 MR. STOKES: Beverly, go ahead.

17 MS. ALEXANDER: I just wanted to really
18 agree wholeheartedly with what Jennifer said about the
19 social science move into energy or more energy people
20 are bringing in social sciences because if you think of
21 the traditional grid, it was largely all behind the
22 scenes. You know, all you had to do was flip the switch
23 and turn the knob, and whatever, energy just showed up
24 magically, and it was all wholesale, behind the scenes.
25 So as we move to a more distributed model of energy

1 where it is more of a retail encounter, you're actually
2 planning where that solar cell goes or you're thinking
3 about your energy efficiency project that we have to --
4 energy people need to bring in all the tools that
5 retailers have always brought in. I mean, it's nothing
6 new. In the retail market, bringing in all these social
7 science people. It's just new in energy, right, because
8 it used to be a wholesale thing. So I just think that
9 that's a hugely positive move, and I think that the more
10 promote that in areas that are going to become
11 distributed in areas that are going to be centralized.

12 MR. STOKES: Any followup for this question?

13 Okay. So we'll move to the fourth question.
14 What technologies besides photovoltaic or strategies,
15 such as zero net buildings, could potentially benefit
16 from innovative business models or finance mechanisms
17 the way rooftop PB has been benefited from third party
18 leasing. What funding levels would be needed to pilot
19 these potential business models or strategies.

20 MS. ALEXANDER: I would strongly encourage
21 you to stay open that all different areas are going to
22 be benefit from innovative business models. We've seen
23 that across the board. I think you're going to have to
24 probably design funding around a case-by-case basis. I
25 don't know that you can generally answer that question,

1 but as I have mention before, we have worked across the
2 entire market innovative business models, have come up
3 in every single one of them, so I'd hate to rule
4 anything out.

5 MR. STOKES: George.

6 MR. CRANDALL: This is George. I think
7 making long-term building upgrades is part of an
8 investment in the facility and not part of home
9 ownership, loans, individual loans, and I know there's a
10 program in the state going on trying to do that. I
11 think that's a big benefit to bringing other
12 technologies to the market.

13 In Europe, there's a big effort, of five
14 countries come together for solid oxide fuel cell
15 adaption at the home level for natural gas to
16 electricity and also heat and hot water. They're
17 financing 1,000 units at about -- from five or six
18 companies in various countries, each of them picking
19 target markets usually trying to support some company in
20 their own country, but a program like that is financed
21 by the state, in this case, would make sense to advance
22 these kind of technologies.

23 MR. STOKES: Thanks, George.

24 Anyone on line want to address this question?

25 MR. GOULD: Um, you know, the -- I think --

1 I think it's a question best addressed maybe by a policy
2 expert but I do think there are certain signs that, that
3 one can see that, that indication a public or indicate
4 of some kind that's relevant, so, you know, for
5 instance, an energy efficiency, of course, we all know
6 that the investments in energy efficient technologies
7 tend to be very strong, but the paybacks can oftentimes,
8 from most advance technologies at least, be relatively
9 long. And so where there's that kind of market failure,
10 where the public, as a whole, you know, would benefit
11 from a given investment but, you know, a particular
12 individual may not have that incentive because he or she
13 may not stay in that residence for long enough, may not
14 own or use that piece of equipment for long enough, you
15 know, those, those are definitely telltale signs that
16 there's a public interest in stepping in to address that
17 market failure or that mixed alignment of incentives and
18 where that action could benefit the public of as a
19 whole, that's where it seems to make market sense, but I
20 think the particular mechanisms and the funding the
21 level are going to differ depending on the
22 circumstances.

23 MS. GARSON: This is Jennifer. I mean, I
24 think, again, all the print ups of that whole idea is,
25 of course, for incentives, a lot of market adoption of

1 energy technology is driven primarily by policy levers
2 particularly at the deployment level. We have seen,
3 through federal incentives, whether it's been through
4 federal tax policy or through the Recovery Act Policy,
5 that when the policy signals are there, the market will
6 oftentimes move on. So, so, you know, whether it's
7 through energy efficiency tax credit for building
8 owners, whether it's, you know, incentives for energy
9 producers. I mean, I know that the State of California
10 already does a lot of these policy including incentives
11 for and mandates for energy storage among others, but,
12 you know, looking into other -- kind of, carrots through
13 the policy is always a good idea if you're trying to
14 incentivize for the deployment. I think there's also,
15 you know, obviously, room to talk with utilities about
16 their own rate design and how you can create better
17 incentives for -- and to adopt more efficient
18 technologies. Obviously, there have been certain
19 utilities that have moved on this across the country
20 including looking at the whole fit fuel idea. I think
21 there's a lot of -- there's a lot of thinking right now,
22 though, new business models whether it's utilization of
23 craft funding through equity states like mosaics or just
24 craft funding for philanthropic reasons. I will --
25 actually, Beverly said it, that you don't want to cycle

1 anything of these things either, because I think there
2 are a lot of great ideas out there for business model
3 redesign in the energy sector.

4 MR. STOKES: Thanks, Jennifer.

5 Anyone else want to add anything?

6 Okay. So we'll go on to the last question. To
7 what extent do existing clean energy business
8 incubators, business plan competitions, innovation
9 clusters support companies in scaling up to commercial
10 production? What critical need would be addressed if
11 EPIC funds were available to help startup companies gain
12 access to these services. How can the Energy Commission
13 through EPIC address critical needs related to
14 facilitating partnerships to bring innovator clean
15 energy technologies to market?

16 MS. ALEXANDER: I think we all reinforced
17 the notion that you can have a great technology but if
18 there's not business vision or not business skills or
19 business partners, you're never going to get there.
20 Technology alone just isn't going to walk in the market,
21 and so the more you can do the -- I mean -- doing a
22 great job of working in the space, the more you can
23 partner in that space. I think -- at the state level, I
24 think that would be fantastic. I would just encourage
25 you, from what we have seen, there's definitely some of

1 these programs that seem to start at the business plan
2 and go forward, and we have seen there's this rich,
3 fertile soil pre-business plan, where teams aren't even
4 because they're not getting that business thinking
5 driven back far enough. And so I would encourage you to
6 look at the whole space even including pre-business
7 plan, but that I think state involvement there can be
8 very positive. There's a lot of different models of
9 success. So -- probably too numerous to talk about here
10 but things where -- that we have heard already, the
11 inspiration, the matching of business and technical
12 people, the mixers between startups and large corporate
13 strategics, the use of these user agreements to use
14 state equipment so that they can have -- they don't have
15 to spend the capital to get involved. There's many,
16 many different ways you can support this phase. So it's
17 constantly looking at best practices and gaps and then
18 putting the money there and having some kind of a
19 partnership hopefully with the feds.

20 MR. CRANDALL: This is George. One thing
21 I've noted is there is a lot of these incubator programs
22 that are State funded sometimes, university funded
23 sometimes. Some of them are independent companies that
24 fund these with investor organizations behind them.
25 There's no really central program to tie these all

1 together that, you know -- so what happens down in San
2 Diego is not reflected in what happens in the Bay Area.
3 And so something that would let everybody know about
4 these programs and have some sense of an overarching
5 organization to publicize them would be helpful.

6 MR. GOULD: You know, broadly, when we're
7 talking about resources, one of the things that we do at
8 ARPA-E is all performers, when they're awarded funding,
9 they dedicate five percent of it. Sometimes, it can be
10 more. They need a waiver to have less, but they
11 dedicate at least, typically, five percent to technology
12 to market activities. And so we allow performers to --
13 with our input and monitoring and judgement -- we allow
14 those performers to spend those funds as they best see
15 fit, and so that could be one way. You know, they
16 sometimes use that to enter a business plan
17 competitions. You know, Beverly talked about
18 partnership with the feds. You know, in her business
19 plan competition, we have had a couple ARPA-E awardees.
20 So I think there's lots of room for collaboration and
21 partnership. I don't necessarily think duplicating
22 existing activities is the best use. And we have taken
23 the approach of they provide people the resources and
24 coaching and let them make good, informed adult
25 decisions about how to use that. And, you know, we have

1 seen that work pretty well as it relates to the
2 incubators. I think where the public sector makes sense
3 is for -- at least in our case -- that early stage
4 technical development, because while I think all of us
5 are very supportive of the business knowledge and
6 business expertise that these incubators can give and
7 it's critical, you know, there also needs to be,
8 typically, a public sector actor to do that really early
9 stage technical development where it's such high risk
10 that it, frankly, make sense for the private sector to
11 get involved. So I just want to make sure that piece
12 isn't lost, and I think it also, you know, doesn't makes
13 sense to not think about duplicating but still providing
14 folks the resources, making sure that they're aware of
15 and working with, where it's relevant, incubators. I
16 think that would be a useful approach for the
17 Commission.

18 MS. GARSON: This is
19 Jennifer. I want to go back to something that Cole said
20 earlier, too and that's access of information. I mean,
21 one of the things that we see a lot of with
22 entrepreneurs that we work with is that there's not a
23 whole lot of information about which pathways they
24 should be taking in terms of their go-to market
25 strategy. So -- may have a technology but they don't
even know what accelerators or incubators may be in

1 their region unless they happen to be connected up with
2 them. So a real concerted effort to map out the
3 different resources within the State of California, the
4 existing capabilities, the different accelerators and
5 incubator and universities may have, you know, where
6 entrepreneurs should be looking for partnerships and
7 mentors, just a really strong mentor network is
8 critically important for early stage companies as they
9 try to figure out how they commercialize their product.
10 And I think that, you know, the Energy Commission can
11 certainly address a lot of this. So I hope they, again,
12 would be the convening power for all these different
13 organizations to really map out what the different
14 resources are within the State of California. And then
15 also, I mean, you know, providing support for these
16 different, you know, incubators or work competitions.
17 You know, we have seen that through research. I think
18 it's 85 percent of incubators receive some sort of
19 public support, whether it's at the state, local, or
20 federal level. At lot of these incubators are
21 nonprofit. They don't take equity stakes, but they
22 serve a really important role for helping transition
23 technology to market. So, you know, there's always
24 direct support, but then also looking at best practices.
25 So what have been the supported services that have

1 worked best for California since startup. You know,
2 what are the services that should be expanded upon. You
3 know, I think there's a lot of opportunity to do good
4 research and analysis on what the type of the services
5 for the different markets in the clean energy sector
6 could really be a big step in the right direction.

7 MR. GOULD: Just one quick thing to tack
8 onto what Jennifer said in terms of just giving folks
9 information, I think that's actually a really, to use a
10 colloquial terms, I think that's potentially a quick win
11 for the Commission. You know, there are a lot of
12 resources online. We have a section of our website that
13 we call a resource map where it's just a Google map, and
14 there's little flags all over the country where there's
15 resources, and you can imagine creating, consolidating
16 something like that, obviously, probably more California
17 focused for the commission, and that's not a ton of
18 effort. You know, it's, essentially, linking people to
19 publically available sources of, you know, LA clean tech
20 incubator, you know, the Berkeley clean tech to market
21 program, things like that that doesn't necessarily have
22 to be a huge effort or costly but is a good way to give
23 performers the information that they need.

24 MR. HERSHKOWITZ: I wanted to agree with
25 what Beverly and George said earlier about knowledge and

1 information being very important. I think you can't
2 really -- to provide that to be useful you really need
3 to motivate and inspire people to want to get that
4 information, to want to use it, because if you don't
5 have people out there that are excited about starting
6 companies and going out becoming entrepreneurs and
7 building new things, it's just going to sit there and
8 sit there and sit there. And I think the way -- one way
9 you can use business plan competitions and incubators to
10 do this is we applied to both years of the Flow business
11 plan competition, and the first year we applied, we
12 didn't do so well. We didn't fail at the beginning, but
13 we didn't get to the end. And just being there, and
14 seeing that, talking to the other startups. They're
15 talking to the startups that won, you could really see
16 that they aren't much different from you as students.
17 And it shows people a clear path from step one, being a
18 student to step five or ten, which is actually owning a
19 company and being on your own. And I think illuminating
20 that path for people and showing people that there are
21 steps and having people meet other startups and
22 entrepreneurs who are anywhere between step zero and
23 ten, makes it very obvious and very clear, there's
24 doable, tangible real thing, and I think, kind of,
25 building that community in these areas and showing

1 people that there is a step zero to step ten is equally
2 as important as knowledge because that's what motivates
3 people to pursue the knowledge and find the knowledge on
4 their own.

5 MR. STOKES: Beverly.

6 MS. ALEXANDER: Yeah, just building on some
7 of these comments, we wondered if there -- we might be
8 able to create a California wide energy mentorship
9 network, because Clean Tech Open has a great network.
10 We have got about a thousand person mentorship network,
11 so some, some possibility of -- I like this idea of
12 linking these mentorship networks and maybe cataloging
13 by subject and sector or whatever and also linking the
14 library resources. So one of the advantages is that we
15 have is our students have access to all of the Berkeley
16 libraries, and so things that would cost people four or
17 \$5,000, to get it outside the university, they can get
18 access to inside. And I'm wondering if the State can
19 play a role with access to library resources or help
20 with subscriptions services. There's some amazing
21 market resources out there, but they're too expensive
22 for a startup, especially young and really cash
23 strapped. So all of those linking and labeling and
24 reminding people of and making available all those kinds
25 of resources would be great.

1 MR. STOKES: Any followup on line?

2 Okay. With that, I think we'll move to the
3 public comment questions. We'll start with those in the
4 room. If you have a question or comment, come up to the
5 podium and, for the court reporter, please state your
6 name and organization.

7 MR. HORSTING: Walter Horsting, Business
8 Development International representing a national gas to
9 liquid fuels breakthrough technology and also a Canadian
10 firm building molten salt reactors that I wanted to
11 address.

12 For Josh, I was wondering if there was any
13 research of funds out there for mitigating flare gas
14 emissions. There's roughly six trillion units yearly
15 being emitted into the atmosphere, and I'm representing
16 a process that could be very helpful on orphan well
17 site, well head sites for that.

18 The second issue I wanted to bring up is that
19 green energy requires a massive amount of rare earth
20 elements. Lithium for batteries Magnesium for magnets,
21 and various rare earth elements for solar panels.
22 There's a vast wasteland of, of a toxic leftover
23 including thorium being left behind in this mining. The
24 unique aspect and the DOD -- I mean, DOE has actually
25 allowed China to be working on the thorium molten salt

1 reactor using Oak Ridge National Labs information -- is
2 that we can take the thorium that's being literally
3 tossed into tailing ponds and have hundreds of years of
4 absolutely clean emission free energy, and I would like
5 to suggest that we look at a thorium and rare earth
6 federally chartered development bank to allow the private
7 sector to develop useful, useful local stream of rare
8 earth elements not have a monopoly forcing all advanced
9 green energy to China for manufacture for sourcing of
10 the rare earth elements, which is currently the case, to
11 bring industry back to the United States and California.

12 I'm, right now, being asked to look at fifty-year
13 franchises for nuclear power desalinization plans. I'm
14 going to have to go to Canada for supply and to the
15 Middle East for partners to make that happen when that
16 could be being done in the Port of Oakland or Port of
17 Long Beach and ship globally and also help with our
18 current drought situation.

19 So I would just like to advocate thinking about
20 thorium rare earth development bank to get the
21 environmental impact off of the mining. We don't have
22 to mine for any more energy, because it's just sitting
23 in tailing ponds. Literally, thorium is everywhere, and
24 we might as well use it cleanly. Thank you.

25 MR. STOKES: Any more questions?

1 Okay. So Tom Jensen from Enterprise Futures
2 Network.

3 MR. JENSEN: Hi. Enterprise Futures Network
4 is a nonprofit that was founded in 2003, and it's a
5 mentor based network that works with universities
6 throughout the country including NYU and Duke and
7 Michigan Rice and others, and so what we do is we draw
8 on volunteer experiments in terms of a business
9 community who volunteer largely in entrepreneurial
10 classes and business plan competitions, and I'd like to
11 echo what people have been saying about the role that
12 the CEC can play in terms of them pulling together a
13 process and framework and resources and in one place.
14 It's not just PDFs or links but actually kind of a --
15 you know, it's about commercialization or about, you
16 know, getting funding or whatever. Again, there's a
17 process associated with that, so I think you can do a
18 good job, kind of, laying out something maybe in an
19 interactive website that can do that.

20 And then, you know, entrepreneurs or inventors
21 even pre-company, they can learn a lot from mentors, and
22 they can also learn a lot from themselves. You know, I
23 think one of the most valuable things in these business
24 planning competitions or other forums in terms of -- is
25 if you can get them together and sectors, different

1 sectors, for two, three days where they can all, you
2 know, learn from each other and particularly over the
3 web, you might be able to find a cofounder or someone
4 who wants to collaborate with you. So I think there's a
5 lot of things you can do.

6 MR. STOKES: Thanks, Tom.

7 Any more public comments or questions in the
8 room?

9 Oh, we have one more.

10 MS. TEN HOPE: This is Laurie ten Hope from
11 the Energy Commission, and I'm just interested in your
12 thoughts on how you prioritize the companies that you
13 help. Not all ideas or teams are equal, and if we get
14 attached to all of them -- if we're working with them --
15 but any thoughts you have on really focusing on the
16 cream of the crop.

17 MS. ALEXANDER: So even -- we run two
18 selections communities when we're picking our projects.
19 We run, sort of, on an internal one and an external one.
20 The internal one is folks who have worked in tech
21 transfer across Department of Energy labs and
22 universities and inside people who have experience
23 commercializing universities and Department of Energy
24 and other types of technical fields really fundamental
25 research work. So that's our first screen is a more

1 technical screen, and then our outside screen is more
2 investment oriented where we bring in all different
3 kinds of investors whether they're large corporations or
4 venture capitalists or family funds, which are becoming
5 increasingly important right now for patient capital.
6 And so we do an investment screening and we -- out of
7 that, we pick our winners. And we try to be -- we think
8 that a smaller program that has a higher yield is
9 probably better than some huge program that's more
10 buckshot, but that's just our philosophy, so there are
11 different ways. But we do think the screening is
12 important but -- and we screen on a lot of different
13 factors on how breakthrough is the science engineering
14 what -- how -- what are these markets looking like, what
15 is the impact on carbon, so there's, kind of, a social
16 benefit screen, lots of different screening functions,
17 but those are probably our main ones. And then how
18 accessible are the inventors and are they really going
19 to work with the team that's actually going to
20 commercialize this.

21 MR. CRANDALL: This is George.

22 MR. STOKES: Laurie -- oh, go ahead. Sorry.
23 Go ahead.

24 MR. CRANDALL: With the RETC what we really
25 had, as Beverly said, is we had internal screening

1 process, and we would sort those down. Since we were
2 dealing with pretty large equipment type companies and
3 technologies weren't usually breakthrough technologies,
4 refined technologies, so the data that we work with was
5 pretty understandable. We would then pass it on to
6 funding source -- which, in our case, was the Army;
7 sometimes it was grant sources -- and get their approval
8 on the process and have an application for their uses.
9 But it is complicated when you're talking about state
10 money to fund another gasifier or another
11 Fischer-Tropsch process, and it's going to have to
12 develop into a clearer definition or matrix that makes
13 this technology worthy.

14 MR. STOKES: Okay. Josh, I think you were
15 going to weigh in on that.

16 MR. GOULD: Yeah. So I think Laurie has a
17 good point. All of us, whether public or private, have
18 limited resources, so I think how to spend one's time
19 and resources is a really relevant question. For us, we
20 try to focus on a team specific's needs, which sounds
21 really generic, but let me just give you a few examples.
22 So for teams that already have the skills and experience
23 and, and, you know, sort of, fully based competency to
24 do a startup or get a technology to market by their own
25 assessment and ours -- oftentimes, our role is more

1 strictly focused on the convening authority, thinking of
2 it as almost, you know, helping folks with their
3 business development, making introduction where it's
4 necessary but, you know, probably a little bit less
5 direct engagement, a little bit less time because, you
6 know, I think a lot of those people have the folks that
7 have the network and competence to be able to accomplish
8 it, and I think a larger category of teams are those
9 that are willing and able to want to learn more, may not
10 have the skills as it is today or the set of experiences
11 or the team as it is today, to be able to execute on
12 their objectives, and that's where we feel like we get a
13 very good return on the time that we spend with that
14 group of teams. You know, folks who may not be -- may
15 not have it all figured out today, but at least are open
16 and honest about it and willing to improve and learn
17 and, you know, that's where we really have a high touch
18 and can dig in and, you know, help to inspire those
19 people but also help to coach and teach those folks. I
20 think one advantage that, that we have -- it may not be
21 as relevant to the commission -- it's where and when we
22 find a project that is not performing or a team is not
23 going to have the impact that they intended either
24 because they gave their best efforts and it particularly
25 isn't going to work out because they're doing something

1 difficult or, you know, maybe they have made some
2 mistakes of their own volition, we can -- we can
3 eliminate them. And so we try not to use that stick, so
4 to speak, where it isn't relevant but it is helpful in
5 terms of making sure that we're spending our time where
6 we have an impact. So, again, just adopting that
7 approach based on what a specific team's needs are. I
8 think being flexible has been really helpful to us.

9 And then just to that first -- that gentleman's
10 first question, just two quick responses. First, you
11 know, flaring is definitely a large problem. We, in
12 general, can't talk about potential future programs,
13 because it would give someone a benefit, so I can't
14 really speak to whether we will or will not run a
15 program around that, but it is an emissions problem and
16 then as it relates to rare earth, we actually have an
17 entire program 35 to \$40 million of investments around
18 finding rare earth replacements for materials where is
19 needed. You know, there's applications in consumer
20 electronics, of course, magnetics, motors, et cetera.
21 So we're running a program around that problem to
22 address it, but again, as it relates to Laurie's
23 comment, I think being flexible and trying to spend
24 time, you know, eliminating teams that, that -- who --
25 whose participation is not going to benefit them or the

1 commission and then being able to work with teams where
2 they may not be, sort of, fully baked but at least
3 they're open and willing to learn and inspire to learn,
4 that's where we find that highest return on our own time
5 and effort.

6 MR STOKES: Any more comments?

7 MS. GARSON: Yeah. This is Jennifer Garson.
8 I just wanted to, kind of, give my perspective because a
9 lot of the programs that we run, we fund other
10 organizations basically to find good teams and good
11 companies, and a lot of what we rely on from, from our
12 organizations is really making sure that the teams that
13 they work with are actually committed to really
14 developing their technology, and lot of times it's based
15 on personal relationships. And so a real commitment
16 from teams over a couple of months if they really want
17 to be involved in the process. But, you know, we
18 also -- we rely on network to basically help do the
19 vetting for us. If I try vetting every single
20 technology that went through the business plan
21 competition I wouldn't have, you know, any time to
22 execute anything else. So we rely on our really good
23 partners that we wanted to help carry out these
24 activities, but in terms of characteristics that we have
25 seen in companies that have been done well either

1 through the innovations ecosystems initiative or through
2 the business plan competition, a lot of it really does
3 come down to the team itself. Some of the people we
4 have seen that, you know, won national prizes or have,
5 you know, done good phases are people who are okay with
6 not getting ranked the first time. In fact, you know,
7 our national, one of our competitors this year has gone
8 through competitions the previous year hasn't done
9 anything, came back and really were committed to
10 developing this technology, which I think is indicative
11 of a good entrepreneur regardless of whether or not they
12 win competitions. So really making sure that the team
13 is very committed to carrying through their technology
14 and being committed even when there may be, you know, a
15 potential failure is really important.

16 MR. STOKES: Okay. Any other comments?

17 I'm guessing with that, we'll go to those online
18 that wish to have comments or questions.

19 Okay. So Kevin Wolf.

20 There, Kevin? No.

21 Okay. I think that is it.

22 Any closing remarks from the panelist that they'd
23 like to make?

24 MS. ALEXANDER: I think this has been a
25 very --

1 MR. GOULD: I'd just like to say I think
2 that the commission is engaging in this process. I
3 think listening to one's constituents is always good.
4 It's something we try to do at ARPA-E, and I want to
5 say, thanks, for hosting this, and I think you're
6 absolutely doing the right thing in terms of how to best
7 spend your time and effort in funding going forward, so
8 well done.

9 MS. ALEXANDER: Just echo, we're very
10 excited to see you getting engaged in this space. I
11 think it will be very positive.

12 MR. CRANDALL: And I hope that the success
13 rate of projects will increase through these programs.
14 I think that's something that has not been a terrible
15 success rate at the agency, and I think these
16 methodologies will improve the use of the money for
17 these programs.

18 I want to thank CEC for having us today.

19 MS. GARSON: Yeah, I'd also like to thank
20 the commission for convening everybody to talk about
21 these issues and for -- from the energy standpoint, I
22 mean, the issue of trying to address the gap of bringing
23 tech to market particularly in this early stage of
24 commercialization is a really important area, and I'm
25 thrilled to see that you guys are really taking an

1 initiative on trying to tackle some really tough issues,
2 but the great thing is that you have a lot of great
3 actors and great players within your state that are
4 really trying to focus in on that area. So the more
5 that you tap into the current knowledge that you have
6 within your stakeholder, I think the better, but I
7 really want to thank you for inviting us to participate.

8 MR. HERSHKOWITZ: Thank you guys for
9 hosting this. Thank you guys for reaching out to the
10 community, and I think there's a lot to learn about what
11 everyone said here, and I look forward to continuing to
12 learn from everyone in the clean energy community in
13 California.

14 MR. STOKES: Great. Well, I just want to
15 thank all our panelists for participating today.

16 It's 2:45. We'll take a 15-minutes break, and
17 we'll start the last topic of the day at 3:00 o'clock,
18 which will be a staff presentation followed by public
19 comments.

20

21 (Break taken.)

22

23 MS. DOUGHMAN: We're going to get started
24 again, so if everyone can take their seats.

25 MS. NEIDICH: Thanks, Pam. My name is

1 Sherrill Neidich and I work in the Energy Research and
2 Development position and I also -- well, I work in the
3 energy deployment and market facilitation office. I'll
4 be providing an update on the local regulatory and
5 permitting challenges. I'll be providing an overview of
6 the local regulatory and permitting initiatives in the
7 first EPIC investment plan that was the 2002 -- or 2012
8 to 2014, other clean energy regulatory and permitting
9 efforts I did for the second EPIC investment plan and,
10 then I'll have some planning and permitting questions.

11 These are the initiatives that were outlined in
12 our investment plan under the objective 16. These are
13 the permitting and planning initiatives for the 2012 to
14 2014. 16-1 was to conduct pilot demonstrations of
15 localized energy resource markets in each IOU territory,
16 and these pilot programs will illustrate best practices
17 for coordinated planning and will help achieve high
18 penetrations of local energy resources. 16-2 is to
19 provide planning grants to cities and counties to
20 incorporate clean energy technology planning and
21 permitting progresses into local government land use
22 planning, and the grants will provide funding to cities
23 and counties in the IOU territory, the upgrade their
24 comprehensive plans, regulations and codes to promote
25 deployment of clean energy technologies and balance

1 development impacts. And 16-3 was to conduct a local
2 government needs assessment study that identified
3 regulatory gaps within local planning and zoning
4 processes, and this will be a review and will be
5 consisting of existing planning and zoning documents in
6 assessing needs or gaps. And four, 16-4, was
7 collaborate with local jurisdictions and industry
8 stakeholders to create model ordinances for emerging
9 clean energy technologies and this will assist the local
10 governments with establishing appropriate ordinances in
11 advance of new technologies -- of advance of new
12 technologies becoming fully deployable in markets. And
13 16-5 is to provide funding to assist in the
14 implementation of the general plan guidelines and
15 through a competitive bid process, a contractor will be
16 selected to work with OPR, Office of Planning and
17 Research to ensure local governments have the tools to
18 implement clean energy aspects of the guidelines in the
19 IOU territory. And six, 16-6, is develop consensus
20 based educational materials for local officials
21 interested in facilitating clean energy market growth,
22 and we will develop and disseminate clean energy
23 planning and permitting information for local
24 governments in IOU service territories.

25 There's also some other clean energy regulatory

1 and permitting efforts going on right now. The
2 Governor's office of planning and research general plan
3 guidelines will be out shortly -- will be released this
4 year. And after they're released, there will be a
5 voluntary sixty-day public review period. The general
6 plan guidelines provide cities and counties information
7 that they will use to prepare and update their plans.
8 The web page link noted on this slide will take you to
9 the general plan guidelines web page where you can find
10 additional information and sign up for the general plan
11 guidelines elist.

12 And then there's information for the Desert
13 Renewable Energy Conservation Plan. You can go to that
14 web page to find information about the DRECP, Renewable
15 Energy Conservation Planning Grants Assembly Bill X1-13
16 added public resources code section 25619 -- excuse me.
17 And directed the Energy Commission to provide up to \$7
18 million in grants to 15 qualified counties for the
19 development of revision of roles and policies. And
20 there have been -- the one solicitation went out. It
21 was released in 2013, and the first solicitation, five
22 counties received awards totally approximately \$3.3
23 million and for those counties -- excuse me -- that
24 receive the funds were Imperial, Los Angeles, San
25 Bernardino, and San Luis Obispo. A second solicitation

1 was released on January 18th, 2014 with a deadline to
2 submit applications on March 24th, 2014, and that
3 solicitation will provide up to \$2.5 million in grants
4 for the development or revision of rules and policies
5 and there was ten qualifying counties for that
6 solicitation and for those counties, I mean, those ten
7 qualifying counties were Fresno, Kern, Kings, Madera,
8 Riverside, San Diego, San Joaquin, Stanislaus, and
9 Tulare. And a third solicitation will be posted soon.
10 You can find out more information to promote the
11 development of this on the web page link noted on this
12 slide where you can sign up for the renewable listserv
13 and the commission grant manager for this solicitation
14 is Pablo Gutierrez, who works here at the Energy
15 Commission in the Renewable Energy division.

16 And then we have also Assembly Bill 327, which is
17 distribution resources plans. Assembly 327 requires
18 each IOU to prepare a distribution resources plan to
19 identify optimal locations for distributed renewable
20 generation resources, energy efficiency, energy storage,
21 electric vehicles, and demand response technologies
22 consistent with the goal of yielding net benefits to
23 rate payers. The plans are due to the CPUC no later
24 than July 1st, 2015, and you can read the entire bill at
25 the web page link noted on the slide.

1 And staff is seeking ideas for the second EPIC
2 investment plan. That's the second one for the 2015,
3 2017. We have had some preliminary areas for planning
4 and permitting. And these are listed here. The
5 programmatic environmental impact report, the biomass,
6 the environmental impacts report should focus on
7 streamlining the environmental review process for Senate
8 Bill 1122 type projects. There's also clean energy
9 technologies and infrastructure to improve local energy
10 reliability during anticipated and emergency conditions
11 like, fire, drought, flood, heat waves, et cetera.
12 We're also looking at exploring process innovations to
13 better coordinate IOU planning and local government
14 permitting for the next generation of clean energy
15 deployment, also, regional planning about clean
16 facilities such as mitigation banking and other
17 conservation strategies and, of course, any other ideas.

18 And then here's some questions we'd like to pose,
19 and these, once again, will be for the 2015, 2017
20 investment plan. One, should EPIC provide funding --
21 we're already programmatic -- environmental impact
22 report for biomass? How should this be structured to
23 best capture benefits for IOU electric rate payers? And
24 also, how can EPIC address, planning/permitting barriers
25 to fast track deployment of technologies that can

1 improve local reliability? Three, how can EPIC funds
2 build on work underway to identify preferred areas for
3 distributed generations. What critical needs for
4 planning and permitting on this topic remain
5 unaddressed? Four, what types of tools would be most
6 useful to regional, local planners to facilitate
7 planning, permitting, and, and implementation of clean
8 energy facilities and technology. And five, what are
9 the next generation of permitting and regulatory
10 challenges that the state may face to achieve goals for
11 energy storage, micro grids, and other clean energy
12 policy objectives?

13 And next steps, we would encourage everybody to
14 complete the questionnaire that was sent out with the
15 notice, and the link on this page is for that
16 questionnaire. So if you haven't seen it already,
17 please check it out. We also have a notice for
18 instructions to submit comments. This is the link for
19 that notice, so you find the location where to send any
20 comments, and we encourage everybody to sign up -- if
21 you haven't done so already -- for the Energy
22 Commission's EPIC list server, and that link there is
23 for the web page for EPIC. And once again, our written
24 comments and the questionnaire are due February 13th,
25 2014, and I guess we're going to open up for questions,

1 and, of course, if anyone has any more information about
2 the EPIC program administered by the Energy Commission,
3 you can contact the staff noted on this slide.

4 So I guess first, we'll see if there's any
5 questions out in the audience. Bob.

6 MR. RAYMER: Thank, you Sherrill. This is
7 Bob Raymer, senior engineer and technical director with
8 the California Building Industry Association, and my
9 comments today on this would follow under other ideas,
10 sort of, micro permitting if you will. The first
11 problem that's popped up -- and both of these relate
12 significantly to the existing housing stock and existing
13 commercial stock, the first one for existing housing
14 stock. For about the past six to eight years, the
15 Energy Commission has required duct testing if you're
16 going to put in a new air-conditioner or heater. And
17 what we have found is, of course -- that, of course,
18 makes a lot of sense. We were very supportive of that
19 during the development of the regulations. For those of
20 you that are unfamiliar, before you can put an air
21 conditioner on to an old house put a new air conditioner
22 on to an old house, you have got to check the duct
23 system to make sure that duct system isn't leaking, and
24 if it's an old house, it is leaking and it's usually
25 leaking very badly, in the range of the about 30 to 60

1 percent leakage rate. That being the case, it takes all
2 the sense to require that not only to do testing but if
3 you find a leakage rate over a certain level, I believe
4 it's nine percent, you have got to fix it.

5 Unfortunately, this had the inadvertent, sort of,
6 effect of significantly increasing the cost of fixing
7 the air conditioner. Case in point, it's not uncommon
8 to find HVAC change out jobs that if you fix the duct
9 system or look at, it cost about five grand. If you do
10 fix the duct system and do the testing, it will cost ten
11 grand. So what's happened here, I'll use LA as an
12 example, over 90 percent of the HVAC change outs in the
13 county of LA are currently being done underground.
14 Whether or not this is by a licensed contractor or an
15 non-licensed contractor, number one, they're not pulling
16 the permits. They're -- of course, they're not checking
17 the duct system. They're not fixing the duct system.
18 The home buyer, may or may not be aware of this. I
19 would suspect in most cases, they're not aware of the
20 state requirement, so consequently they may have an
21 excellent 14 SEER or 15 year air conditioner of which
22 they're only maybe getting half of the cool air into the
23 rooms.

24 So with that being said, there -- for the last
25 couple of years, there's been a desire to try to fix

1 this at the local permitting stage and at higher levels.
2 And in looking at a number of initiatives that have,
3 sort of, been bounced around, number one, of course,
4 CSLB has a sting operations, and they have been working
5 off and on with the Energy Commission to help provide
6 technical background support. But to the extent that a
7 more elaborate, and I would say state level and
8 localized level, of education to the public in general,
9 to get this word out could be very helpful. There
10 should also be some type of interaction between the CEC
11 and CSLB with regards to the contractor license board's
12 testing. In essence, HVAC contractors, there should be
13 serious requirements as you take your test, as you do
14 your training, or whatever, that you have got to show an
15 understanding of the state's regulations, because these
16 things evolve before somebody actually goes into the
17 business and pulling permits or whatever, they should
18 fully understand that you can't just simply slap a new
19 air conditioner onto a very leaky duct system. But more
20 importantly, I would say there needs to be some type of,
21 I would say, pilot program done where we investigate the
22 ability to provide a paper trail from the manufacturer
23 to the retailer to the installer to the home. So in
24 essence, we can actually find why, out of the 10,000 air
25 conditioners sold, only 400 had permits pulled, that we

1 have only got a slight idea of where those 400 went.
2 The others, they went somewhere in LA, we just don't
3 know. So with that, that would be one area where it's
4 certainly the peak load of some of these major
5 metropolitan areas could be helped. If there was some
6 focused attention to that. We may have to have statute
7 to go along with some type of the paper trail. I know
8 that labor CBIA and a few other groups are very
9 supportive of that, but it's going to take a lot of work
10 on the part of the Energy Commission to the extent that
11 EPIC would be used to help underwrite some of those
12 initiatives. It would be very useful.

13 The last item I wanted to bring to your attention
14 was something that we have, sort of, being working on
15 with staff for about the last six months, and it's just
16 starting to, kind of, gear up here, and that is, of
17 course, California has its home energy rating service,
18 sort of a way to compare apples to apples among existing
19 housing stock and new housing stock and even newer
20 housing stock, but you should be aware that the national
21 HERS and the California HERS are very different, and I
22 would say in California, I would say probably the top 10
23 to top 15 production builders are doing business outside
24 the State of California along with their California
25 market, and so with that, they're finding great

1 difficulty. To use an example, KB Home has a number of
2 the projects in the southern part of Nevada and then
3 right across the border into southern California, and
4 they can find that the home in California gets a much
5 worse score on the national home energy rating service
6 because a lot of the things that we do in California,
7 that are clearly energy efficient, do not get credit at
8 the national score, and so there has to be some kind of
9 a crosswalk from California to the national program. We
10 have been working with Commissioner McAllister. He's
11 very aware of this issues, and unfortunately, we -- it's
12 a lot worse than what we originally anticipated. We
13 thought that, you know, it's not a huge scale. You
14 effectively got a hundred, couple hundred points or
15 whatever to work within. The same house done -- a
16 minimum client's house in California is actually getting
17 a 22-point difference from other homes built in Nevada
18 when they should be effectively the same. There's a
19 negative 22 points for the home in Nevada or California
20 gets. That's not good, and so to the extent that we can
21 somehow create a consistent system where, not only at
22 the national level, you can compare apples to apples but
23 somehow so California can effectively get the credit
24 that it's due.

25 So I realize that may be sort of a little

1 advanced from what EPIC would normally be doing, but it
2 could be immensely helpful, particularly, as we move
3 further into the existing housing stock. And for a
4 number crunching, we have got 13 and a half million
5 units that are out there, apartments and condominiums,
6 and single-family homes. Two-thirds of them were built
7 before the first set of energy regs took effect, and so
8 there's a huge market of what you might call energy hogs
9 out there, and we'd like to help work on it. Thank you.

10 MS. DOUGHMAN: Any other comments in the
11 room?

12 Any comment online?

13 Okay. So that ends our discussion for planning
14 and permitting, and I would like to remind everyone to
15 provide written comments on the questions we discussed
16 today by February 13th. Also, please submit a completed
17 questionnaire on ideas for the second EPIC investment
18 plan by February 13th. The email address to submit both
19 items is posted here. Please indicate 12 EPIC 01 and
20 EPIC Second Investment Plan in the subject line. And
21 with that, we'll adjourn. Thank you, everyone.

22

23 (Whereupon the proceedings ended at 3:18 p.m.)

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25

1 I, Brittany Flores, a Certified Shorthand Reporter of
2 the State of California, duly authorized to administer
3 oaths, do hereby certify:

4 That the foregoing proceedings were taken before me
5 at the time and place herein set forth; that any
6 witnesses in the foregoing proceedings, prior to
7 testifying, were duly sworn; that a record of the
8 proceedings was made by me using machine shorthand which
9 was thereafter transcribed under my direction; that the
10 foregoing transcript is a true record of the testimony
11 given.

12 Further, that if the foregoing pertains to the
13 original transcript of a deposition in a Federal Case,
14 before completion of the proceedings, review of the
15 transcript () was () was not requested.

16 I further certify I am neither financially interested
17 in the action nor a relative or employee of any attorney
18 of party to this action.

19 IN WITNESS WHEREOF, I have this date subscribed my
20 name.

21

22 Dated:

23

24

25

Brittany Flores CSR 13460