

COMMITTEE HEARING  
BEFORE THE  
ENERGY RESOURCES CONSERVATION AND DEVELOPMENT  
COMMISSION OF THE STATE OF CALIFORNIA

In the matter of, )  
 ) Docket No. 2013-ALT-01  
 )  
Pre-Solicitation Staff Workshop )  
on Electric Vehicle Charging )  
Infrastructure )

CALIFORNIA ENERGY COMMISSION

ART ROSENFELD ROOM

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, JANUARY 28, 2015

10:00 A.M.

Reported By:

Kent Odell

## APPEARANCES

CEC Staff Present

Leslie Baroody, EV Program Manager, California Energy Commission

Sam Lerman

Jim McKinney, ARFVT Program Manager

Lezlie Kimura Szeto, Advisor to Commissioner Janea Scott

Presenters/Panel Members Present

Adam Langton, Senior Energy Analyst, California Public Utilities Commission

Terry O'Day, Vice President, NRG EV Services

Karen Schkolnick, Air Quality Program Manager, Bay Area Air Quality Management District

Patricia Kwon, Air Pollution Specialist, South Coast Air Quality Management District

John Clint, Program Manager, Alternative Energy Systems Consulting

Bill Boyce, Supervisor, Electric Transportation, Sacramento Municipal Utility District

Charlie Botsford, Business Development Manager, AeroVironment

Brett Hauser, Chief Executive Officer, Greenlots

Stephen Kelley, Senior Vice President, Green Charge Networks

Jeremy Matsuo, Fleet Asset Management - Sr. Equipment Engineer, Caltrans

Michael Nicholas, Senior Researcher, University of California, Davis

Terry O'Day, Vice President, NRG EV Services

## APPEARANCES (CONT.)

Presenters/Panel Members Present (Cont.)

David Peterson, Manager, EV Business Development & Infrastructure Strategy, Nissan

Anne Smart, Director of Government Relations, ChargePoint

Lloyd Tran, Managing Director, U.S. Green Vehicle Council

Joel Pointon, Electric Transportation Program Manager, San Diego Gas and Electric Company

John Kalb, Founder, EV Charging Pros

Mary Nitschke, Director of Ancillary Services, Prometheus Real Estate

Richard Schorske, Director, EV Communities Alliance

Jasna Tomic, Research Director, CALSTART

Scott Briasco, Manager of Feet Engineering and Electric Transportations, Los Angeles Department of Water and Power

Cheri Chastain, Sustainability Manager, Sierra Nevada Brewing Company

Tom Harrigan, Commute Solutions Leader, Intuit

Keith Leech, Director of Fleet Services, County of Sacramento

Kevin Kelley, Vice-President of Business Development, Vision Fleet

Thomas Piette, Supervising Architect, Sustainability Unit, Department of General Services

Also Present

\*Tony Williams, Quick Charge Power

Stacey Reineccius, Power Tree

APPEARANCES (CONT.)Also Present (Cont.)

Bill Williams, Telephonics Corporation

Matt Zerega, Liberty PlugIns

Mike Harrigan, Bay Area Climate Collaborative

Guy Hall, President, Sacramento Electric Vehicles

Mark Melena, NREL

Sharon Hoff, San Francisco Clean Cities Coalition, San  
Francisco Department of the Environment

Dexter Turner, OpConnect

Raoul Renaud, California Energy Commission -- on behalf  
of self

## INDEX

	Page
Introduction	
Leslie Barody, EV Program Manager, California Energy Commission	8
Presentations	
Adam Langton, Senior Energy Analyst, California Public Utilities Commission	25
Terry O'Day, Vice President, NRG EV Services	36
Karen Schkolnick, Air Quality Program Manager, Bay Area Air Quality Management District	46
Patricia Kwon, Air Pollution Specialist, South Coast Air Quality Management District	56
Corridor DC Fast Charging	64
Facilitator: John Clint, Program Manager, Alternative Energy Systems Consulting	
Panelists:	
Bill Boyce, Supervisor, Electric Transportation, Sacramento Municipal Utility District	
Charlie Botsford, Business Development Manager, AeroVironment	
Brett Hauser, Chief Executive Officer, Greenlots	
Stephen Kelley, Senior Vice President, Green Charge Networks	
Jeremy Matsuo, Fleet Asset Management - Sr. Equipment Engineer, Caltrans	
Michael Nicholas, Senior Researcher, University of California, Davis	
Terry O'Day, Vice-President, NRG EV Services	
David Peterson, Manager, EV Business Development & Infrastructure Strategy, Nissan	
Anne Smart, Director of Government Relations, ChargePoint	
Lloyd Tran, Managing Director, U.S. Green Vehicle Council	

## INDEX

	Page
Lunch	
EV Charging Infrastructure In Multi-Unit Dwellings	117
Facilitator: Joel Pointon, Electric Transportation Program Manager, San Diego Gas and Electric Company	
Panelists:	
John Kalb, Founder, EV Charging Pros	
Mary Nitschke, Director of Ancillary Services, Prometheus Real Estate	
Richard Schorske, Director, EV Communities Alliance	
Workplace Charging	143
Facilitator: Jasna Tomic, Research Director, CALSTART	
Panelists:	
Bill Boyce, Supervisor Electric Transportation, Sacramento Municipal Utility District	
Scott Briasco, Manager of Fleet Engineering and Electric Transportations, Los Angeles Department of Water and Power	
Cheri Chastain, Sustainability Manager, Sierra Nevada Brewing Company	
Tom Harrigan, Commute Solutions Leader, Intuit	
Light-Duty EV Fleets	185
Facilitator: Leslie Baroody, CEC	
Panelists:	
Keith Leech, Director of Fleet Services, County of Sacramento	
Kevin Kelley, Vice-President of Business Development, Vision Fleet	
Thomas Piette, Supervising Architect, Sustainability Unit, Department of General Services	

## INDEX

	Page
Public Charging and Other Venues	214
Public Comments	227
Adjournment	234
Reporter's Certificate	235
Transcriber's Certificate	236

1

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

1  
2 JANUARY 28, 2015

10:00 A.M.

3 MS. BAROODY: Okay, I think everybody is  
4 trickling in, but we need to get started because we have  
5 a lot to cover today. Good morning to everybody here,  
6 and those of you who are on the WebEx.

7 I'm Leslie Baroody. I'm the Electric Vehicle  
8 Program Manager in the Fuels and Transportation  
9 Division.

10 I really appreciate you taking your valuable  
11 time to be with us today.

12 Before I get started, I just want to cover our  
13 housekeeping items. So, we have bathrooms out the door  
14 to the left. We have a cafe called On The Edge,  
15 upstairs on the second floor.

16 And in the event, of the unlikely event of an  
17 emergency, Energy Commission staff would escort you out  
18 the back doors to the south, across to the park.

19 Also, I'd like you to know that our WiFi is  
20 maxed out, I've been told. So, if you're trying to get  
21 online and you can't, we only have 200 spots and we have  
22 700 people in the facility. So, apologize for that.  
23 I've always wondered why I couldn't get on.

24 Anyway, so today I just want to introduce a few  
25 people that are here, with the Energy Commission.



1           We have Sam Lerman, he's manning our WebEx  
2 through the day.

3           Also, Jim McKinney is here. He's our ARFVTP  
4 Program Manager. Glad to have him here.

5           I think Lezlie Kimura Szeto, Commissioner's  
6 Advisor, will be joining us fairly soon.

7           And then we also have members of our Electric  
8 Vehicle Team.

9           Also, I want to welcome Alternative Energy  
10 Systems Consulting. We've hired them to help us with  
11 infrastructure issues. So, we have John Clint. If you  
12 would stand, John? There's John and his team. Ray? Is  
13 Ray here, too, Ray Pustinger? Thank you for being here.

14           They're going to be helping facilitate our 11:00  
15 session on DC Fast Charging.

16           Okay, I'm just trying to get my slide to  
17 progress. Hold on, just a sec. Thank you.

18           So, I just want to quickly go over the agenda  
19 today. After I speak for about 15, 20 minutes, we'll  
20 have several presentations.

21           Then, at 11:00, we'll have the Corridor DC Fast  
22 Charging Panel. We have a lot to fit in during that  
23 time, so we'll probably devote the entire hour and break  
24 for lunch at noon.

25           We'll return with a 1:00, Multi-Unit Dwelling

1 Panel lead by Joel Pointon.

2 At 1:45, Jasna Tomic will be leading us on the  
3 Workplace Charging Panel.

4 And then at 2:30, I'll be leading the Light-Duty  
5 EV Fleets Panel.

6 At 3:15, we'll have a short amount of time to  
7 talk about kind of what's remaining, Public Charging and  
8 Other Venues.

9 And then, at 3:30, we'll have public comment.  
10 You have something you'd like to say at 3:30, we have  
11 some blue cards. If you would kindly fill them out and  
12 leave them here with Sam, then we'll call your name to  
13 speak, and then we'll get you out of here by 4:00.

14 So, really, the purpose of today's workshop is  
15 to get input, to get your input on the development of  
16 our EV solicitation. We really want to identify optimal  
17 strategies for funding charging infrastructure projects.

18 This is a complex and quickly evolving  
19 environment, so it's important that we have the most up-  
20 to-date information. We want to gain a better  
21 understand of the gaps and the barriers that need to be  
22 addressed. And we want to obtain information to assist  
23 us with the prioritization of our funding for EV  
24 infrastructure.

25 There are many other complementary efforts going

1 on right now. Of course, many of you know about the  
2 Governor's Office Zero Emission Vehicle Action Plan that  
3 is underpinning a lot of what we do.

4 Also, Commissioner Scott has held a series of  
5 workshops for the Integrated Energy Policy Report for  
6 2014. And many of you were here this past year, this  
7 past summer, where we had several workshops on  
8 transportation. And that draft report is posted and I  
9 think a final report will be coming out fairly soon.

10 Also, the California Public Utilities Commission  
11 had a recent decision on the role of utilities with  
12 regard to charging infrastructure. Adam's going to be  
13 here today to talk about that.

14 We're also collaborating with the Treasurer's  
15 Office, the California Pollution Control Financing  
16 Authority, to roll out a charging infrastructure  
17 financing pilot. And Larry Rillera is on point for  
18 that, on our team.

19 And Larry, are you here? If you have any  
20 questions, you can ask Larry.

21 Also, the Plug-In Electric Vehicle Collaborative  
22 continues to do really essential work to support PV  
23 adoption in California.

24 Also, the Air Resources Board. I see Leslie  
25 Goodbody here. She's done a lot of great work in the

1 last year and held many workshops on the subject.

2 Also, Caltrans, we have Jeremy Matsuo here  
3 today, and many other agencies, as well as Air Quality  
4 Management Districts.

5 And we have Patricia Kwan from South Coast here  
6 today, and Karen Schkolnick from the Bay Area Air  
7 Quality Management District.

8 So, funding for this upcoming solicitation is  
9 from the Alternative and Renewable Fuel and Vehicle  
10 Technology Program, that's ARFVTP. This program was  
11 extended last year by Assembly Bill 8, for \$100 million  
12 per year, through January 1st, 2024.

13 Its purpose is to develop and deploy innovative  
14 technologies that transform California's fuel and  
15 vehicle types to help attain the State's climate change  
16 policies.

17 The primary policy objectives underlying EV  
18 infrastructure investments are, of course, to reduce  
19 greenhouse gas emissions, reduce petroleum use, nitrous  
20 oxide, and reduce the carbon intensity of transportation  
21 fuels.

22 Also, the Governor's 2012 Executive Order calls  
23 for 1.5 million zero emission vehicles on California  
24 roadways by 2025. And infrastructure to support a  
25 million zero emission vehicles, or ZEVs, by 2020.

1           So, the ARFVTP program invests in a portfolio of  
2 alternative transportation fuels and advanced vehicle  
3 technologies.

4           Electric drive accounts for about 30 percent of  
5 our total investments to date, or about \$160 million.

6           As you can see in this graph, this shows all  
7 existing agreements from 2009 to the present, with  
8 ARFVTP program to date with a large share devoted to  
9 electric drive infrastructure vehicles and  
10 manufacturing, as shown in green.

11           I mentioned the ZEV Action Plan. As we consider  
12 future EV charging infrastructure investments, we're  
13 focused on attaining the goals set forth in the ZEV  
14 Action Plan. By 2015, the State's major metropolitan  
15 areas will be able to accommodate ZEVs through  
16 infrastructure plans and streamlined permitting.

17           We've made a lot of great progress in this area  
18 and I'll talk a little bit more about those plans in a  
19 minute.

20           By 2020, the State's ZEV infrastructure will be  
21 able to support up to a million vehicles. And by 2025,  
22 as I mentioned over a moment ago, over 1.5 million ZEVs  
23 will be on California roadways and their market share  
24 will be expanding.

25           California will also have -- Californians will

1 also have easy access to ZEV infrastructure. So, those  
2 are the three benchmark goals.

3 The Governor's ZEV Action Plan has over 120  
4 specific actions that various agencies are committed to  
5 achieving. And the Energy Commission is responsible for  
6 quite a few of them, and these are just a few that  
7 relate to PEV infrastructure.

8 A couple years ago we held a large joint  
9 workshop here, on EV infrastructure. I think probably  
10 many of you were here at that time. We held that with  
11 the Governor's Office and the Air Resources Board to  
12 solicit input on the development of a statewide EV  
13 infrastructure plan.

14 Well, last year the National Renewable Energy  
15 Lab completed a statewide PEV infrastructure assessment,  
16 and I'll talk about that in a minute.

17 So, we're making really good progress on many of  
18 these action items, including completion of regional  
19 plug-in electric vehicle plans, and those also include  
20 infrastructure plans.

21 Also, the West Coast Green Highway, from British  
22 Columbia to Mexico, is one of the goals here. And  
23 through CEC investments, we've begun to complete that  
24 highway to Mexico.

25 However, more charging stations are needed and

1 we're going to talk more about that in our 11:00 panel.

2 Sales of plug-in electric vehicles have  
3 increased steadily over the past several years. Over  
4 118,000 are on California roadways, now. However, there  
5 has been a noticeable decline in the last quarter and  
6 it's possible this could be to lower gasoline prices.

7 The automakers continue to innovate and improve  
8 on electric vehicle models. There are currently 20, or  
9 maybe more now, more PEV models available for sale in  
10 California, with new models just recently announced.

11 Many of these models will have increased  
12 electric range, as well as fast-charging capability.

13 And I don't know about you, but I'm looking  
14 forward to the Super Bowl this year because I hear that  
15 one of the automakers has a spot, and a pretty good  
16 commercial, so stay tuned.

17 This is a quick summary of our EV funding  
18 support. The Energy Commission has invested over \$38  
19 million in charging infrastructure and funded over 9,300  
20 chargers.

21 The Energy Commission has also provided the Air  
22 Resources Board with \$49 million, for over 21,000  
23 vouchers. And provided \$5.1 million in grants for  
24 regional readiness planning and implementation.

25 This particular graphic is courtesy of Air

1 Resources Board. The California charging infrastructure  
2 has almost doubled in the past year. And the number of  
3 fast chargers have actually quadrupled. California is  
4 really on track to meet the Governor's targets for  
5 infrastructure to support a million ZEVs by 2020.

6 But infrastructure really must keep pace with PV  
7 adoption and extend to areas which, so far, have  
8 received little investment.

9 Not surprisingly, regions with the most PEVs,  
10 and these are the darker-shaded regions on this map,  
11 they also have the most public charging stations. The  
12 blue here are the level 2 and the green are the DC fast  
13 chargers.

14 So, the Los Angeles and the San Francisco Bay  
15 Regions, for example, have 75 percent of PEVs and 73  
16 percent of public chargers.

17 As I mentioned, we've done a lot of regional  
18 readiness planning in other to prepare California's  
19 regions for electric vehicles.

20 In 2011, the DOE funded six PEV regional  
21 readiness plans and the Energy Commission also invested  
22 \$2 million for ten regional readiness plans that  
23 actually complemented the DOE awards.

24 So, these plans are now completed and they  
25 provide plans for streamlining of the permitting and



1 inspection processes, updating building codes,  
2 development of infrastructure, as well as education and  
3 outreach.

4 A subsequent award for \$2.27 million was awarded  
5 for eight alternative fuel readiness plans, some of  
6 which include EV readiness plans. That was just this  
7 last year.

8 And then in the fall, the Energy Commission  
9 released a "Preparing for ZEVs" readiness solicitation.  
10 And those are for implementing existing plans and then,  
11 also, forming ZEV readiness plans, which could include  
12 fuel cell electric vehicles. So, eight awards have been  
13 made for that one for over \$2 million.

14 Here's a chart of the existing ten PEV regions  
15 and the awards that they received.

16 And last May, I mentioned that the National  
17 Renewable Energy Lab, NREL, completed a statewide PEV  
18 infrastructure assessment, which establishes a framework  
19 to estimate the level of charging infrastructure needed  
20 to support a million ZEVs by 2020.

21 The report provides estimates of the charge  
22 points by location and type for two scenarios; the home  
23 dominant and the public access.

24 So, in both scenarios, home charging is the  
25 primary location. However, in the home-dominant

1 scenario, it assumes that 85 percent of charging will be  
2 done at home. And the high public access scenario  
3 assumes that 70 percent will be done at home.

4           These bookend estimates are available by region  
5 and help to inform our investments in infrastructure.  
6 And we'll soon be working with NREL to update the  
7 assumptions in this assessment and come out with new  
8 results.

9           This is from the report, as well. These  
10 triangles depict the different rations of home, work and  
11 public charging depending on the scenario.

12           For example, with a high public access scenario,  
13 70 percent of charging would be done at home, 22 percent  
14 in workplaces, and 8 percent in public locations,  
15 including corridors.

16           Just as a reminder these are scenarios and there  
17 are assumptions underlying the scenarios. So, as the  
18 assumptions change, so will the results in the report.

19           Just to recap some of our infrastructure  
20 investments, in our first round of EV infrastructure  
21 funding, for \$16 million, we partnered with the Federal  
22 Stimulus Grants for the EV Project, and the Charge  
23 America Projects in the major metropolitan areas of the  
24 state.

25           The second round of Energy Commission funding

1 resulting in 7.5 million awards for residential  
2 workplace fleets and DC fast charger demonstrations  
3 throughout California.

4           The most recent CEC solicitation, for \$11.4  
5 million, was a little more strategic and focused on the  
6 needs of the PV market. It was unique in that it  
7 required most applicants to be public entities that had  
8 to consult with regional PEV plans to ensure  
9 compatibility.

10           These awards were for destinations, workplace,  
11 public corridor, and multi-unit dwellings, and included  
12 76 DC fast chargers. This solicitation was over-  
13 subscribed by a factor of two and a half.

14           So, in the 2014-2015 Investment Plan, the Energy  
15 Commission allocated \$15 million for EV infrastructure.  
16 That's almost double the previous allocation.

17           And in the current 2015-2016 Investment Plan,  
18 the Energy Commission's proposing \$18 million for EV  
19 infrastructure.

20           This is a summary of our last solicitation, 13-  
21 606. And as we develop our next solicitation, we're  
22 kind of using this as the starting point. So, this one  
23 had four categories, with the maximum awards shown here.  
24 Category one had the most applications and was available  
25 for public entities, and required coordination with

1 regional PV plans.

2 We had, actually, very little uptake on the  
3 multi-unit dwelling portion of this solicitation and we  
4 are especially interested in seeing how we can better  
5 structure our next solicitation so that we have a little  
6 bit more success with multi-unit dwellings.

7 Here is a summary of some of the awards that  
8 were made. You can see level twos, airports, colleges,  
9 universities, hospitals. Over 50 level twos and then 20  
10 DC fast chargers at regional and state parks in  
11 California. So, a total of 76 DC fast chargers. Not  
12 75, but 76, at airports, hotels along major corridors  
13 and other locations.

14 So, I just wanted to mention the Plug-In  
15 Electric Vehicle Collaborative. The produce two very  
16 useful publications on workplace and multi-unit dwelling  
17 charging infrastructure issues.

18 Those working groups continue to meet regularly  
19 to address challenges and provide outreach and  
20 education. Joel Pointon and Karen Schkolnick lead those  
21 groups.

22 So, I just want to quickly go over some of these  
23 sectors and what some of the barriers are, some of the  
24 challenges.

25 More than half of California's population reside

1 in multi-unit dwellings, with even a higher percentage  
2 in major metropolitan areas, such as San Francisco.  
3 These are often areas with high plug-in electric vehicle  
4 adoption, as well.

5 We're going to explore some of the challenges  
6 and seek ways that our solicitation can address these  
7 challenges this afternoon.

8 But just a summary of the key barriers are the  
9 cost, the availability of power supply, proximity to  
10 metering equipment, physical limitations, especially in  
11 high-rise units, parking issues, homeowner association  
12 requirements, allocation of charging costs, and just the  
13 complexity of the whole decision making process.

14 In a recent PEV Collaborative Survey, companies  
15 were asked to identify their top challenges to  
16 installing charging stations. The top two were the cost  
17 of installation, which varied from about \$1,500 to  
18 \$30,000, and the cost of equipment, which ranged from  
19 \$3,000 to \$5,000.

20 More than a third of these workplaces received  
21 some level of grant funding, while the remaining two-  
22 thirds covered their costs with their operating budgets  
23 or with third-party ownership or financing.

24 In some areas, such as Silicon Valley, charger  
25 congestion is increasing in many locations. In fact,

1 there's been even reports of charger rage. About two-  
2 thirds of the surveyed workplaces do not charge a fee  
3 for parking.

4 So, one area we'd like to explore today is how  
5 the state can best support new installations, as well as  
6 expansion of existing workplace charging infrastructure.

7 This is our latest fast charging station map,  
8 courtesy of AESC. In our session later this morning,  
9 we'll talk about the highway corridors and explore the  
10 challenges and opportunities in greater depth.

11 California has made substantial progress with DC  
12 fast charging, as I mentioned earlier, especially in the  
13 large metropolitan areas.

14 The DOE's Alternative Fuel Data Center, which is  
15 really our go-to site to know where all the chargers are  
16 in the state, and in the nation, that AFDC side reports  
17 198 DC fast charge stations as of yesterday.

18 Tesla continues to build out its super-charger  
19 network, with 23 stations in California.

20 And NRG eVgo is making good progress with, I  
21 just heard I think yesterday, 120 fast chargers  
22 installed in California.

23 The Energy Commission has funding for 113, with  
24 plans for more. And we're going to be hearing from  
25 South Coast and the Bay Area about their existing fast

1 chargers and their future plans.

2           So, in addition to Tesla, other automakers  
3 continue to deploy fast chargers, including Nissan. And  
4 they just announced, or not they -- but BMW and VW  
5 announced a collaboration with ChargePoint for 100 DC  
6 fast chargers on the West Coast and the East Coast of  
7 the United States. So, we're hoping to hear more about  
8 that today.

9           Finally, the Japanese new industrial -- New  
10 Energy Industrial Technology Development Organization,  
11 NEDO, for short, they recently signed a letter of intent  
12 with the California Governor's Office of Business and  
13 Economic Development, or GoBiz, to begin a feasibility  
14 study for a DC fast charger network in Northern  
15 California.

16           The NEDO-financed network would serve as a  
17 source of data and information on PEV driver behavior  
18 and would be located on highway corridors, most likely  
19 from the Bay Area to destinations such as the Monterey  
20 Peninsula and the Lake Tahoe Region.

21           And I know Tyson Eckerle is here today,  
22 representing GoBiz and he's going to be helping, he's  
23 going to be working on that project.

24           So, some of the -- just a quick summary on some  
25 of the challenges with DC fast charging deployment.

1 Finding willing site hosts seems to be one of the most  
2 difficult aspects of DC fast charging installations.  
3 And this can often be related to the lack of a business  
4 case. The costs of installation and maintenance, high  
5 power requirements, and power upgrade costs, high demand  
6 charges, the time it takes to obtain a permit and find  
7 optimal locations that are convenient and appealing to  
8 consumers.

9           These challenges, however, are not  
10 insurmountable and we'll hear more from our panelists  
11 today on how this may be addressed.

12           This slide is from our upstate region. And they  
13 do perceive a gap in their region. And this is the gap  
14 for the West Coast Electric Highway, north of Sacramento  
15 to the Oregon border.

16           And one of our major goals, and part of the  
17 Governor's ZEV Action Plan is to complete the West Coast  
18 Electric Highway. And we'll be talking about that again  
19 in our 11:00 session.

20           So, that pretty much wraps it up. I have some  
21 resources here. And just to let you know, the timing of  
22 our next solicitation is likely to be very late spring,  
23 early summer.

24           I encourage you to sign up for our  
25 Transportation List Serve, if you have not already done



1 so. And that way, you're alerting to our solicitations,  
2 and workshops, and documents, and any other important  
3 information.

4 And if you have additional comments, we may not  
5 have time to hear everyone's comments today, so I  
6 encourage you to send those in to me, or the AB 118  
7 website.

8 So, thank you very much for your attention.

9 (Applause)

10 MS. BAROODY: Oh, let's see, Adam Langton, are  
11 you here?

12 I'd like to introduce Adam Langton. He is a  
13 Senior Energy Analyst with the California Public  
14 Utilities Commission.

15 MR. LANGTON: All right, thank you CEC for  
16 inviting me to speak here today. My name is Adam  
17 Langton. I'm an analyst with the California Public  
18 Utilities Commission. I'm the staff lead on the  
19 Commission's Alternative Fueled Vehicle proceeding.

20 And what I'd like to talk about today is give  
21 you an update on our proceeding. I'll give you an  
22 update on where we are on the energy settlement, and  
23 talk about some goals and strategies related to charging  
24 investments, based on some of our experience in this  
25 space.

1           So, first, we have a proceeding that we started  
2 in October of 2013, looking at issues to promote  
3 alternative fuel vehicles.

4           And after starting that proceeding, we reached  
5 out to parties and asked them to provide feedback on  
6 what issues we should be tackling in that proceeding.

7           And in July, of last year, we issued a scoping  
8 memo that listed -- that identified these issues here,  
9 listed in the middle of the slide, as kind of the key  
10 issues that we wanted to identify first in that  
11 proceeding.

12           And the first action that we took in the  
13 proceeding, then, was to issue a proposed decision  
14 related to infrastructure policy in the role that  
15 utilities lay in infrastructure development for electric  
16 vehicles.

17           And so, that decision was passed out by the  
18 Commission in December. And it revised our existing  
19 polies in this space.

20           In 2010, we had a decision that -- so, the  
21 utilities were not allowed to own charging  
22 infrastructure. And we said that if the utilities were  
23 interested in entering this space, they needed to  
24 identify a market failure and make a proposal to us for  
25 what role they should play in addressing that market

1 failure.

2           Parties came to us and said that they thought  
3 that the market failure test was not well defined and  
4 hard to -- hard to identify, based on a kind of a vague  
5 definition of what a market failure was.

6           And so, what the Commission did was replace that  
7 test with a balancing test. Which, instead of looking  
8 for a market failure, looks at the benefits of having  
9 utility-owned charging infrastructure and weigh that  
10 against the impacts on the competitive market.

11           In that decision we identified a few specific  
12 elements, that are listed at the bottom of this slide.  
13 But in general, the balancing test was defined pretty  
14 broadly and it's something that we'll have to work with  
15 parties on to define the individual elements and how we  
16 actually measure that.

17           We received two infrastructure proposals, one  
18 from San Diego Gas & Electric and one from SCE. The  
19 proposals are similar in some ways, they're both largely  
20 aimed at bringing infrastructure to apartments and  
21 workplaces. SCE's proposal also includes some points of  
22 interest sites, as well.

23           And they would also, each involve the utility-  
24 owning infrastructure on the customer side of the meter.  
25 Traditionally, the utility owns infrastructure on its

1 side of the meter and doesn't own infrastructure on the  
2 customer's side of the meter, although there are  
3 specific examples in the past where we have allowed the  
4 utilities to own infrastructure on the customer side.

5 So, that will be one of the big issues that  
6 we'll have to look at is, you know, that role with the  
7 customer -- with the utility having infrastructure on  
8 the customer side.

9 The two proposals are different in one kind of  
10 key respect, and that is that SCE is proposing that the  
11 customer would actually own all of the infrastructure  
12 beyond kind of the make-ready elements of it.

13 So, the customer would be responsible for owning  
14 the charging station and they could work with a third  
15 party on that. And the third party on the site would be  
16 responsible for dealing with the billing of a user on  
17 that.

18 SDG&E's proposal, instead, is vertically  
19 integrated. The utility would actually own all  
20 components of it. They would own the charging station  
21 and they would own the accounts that the customer's  
22 charging off of, and they would bill the customer  
23 directly. So, they kind of present different roles for  
24 what the utility would play in dealing with this  
25 infrastructure and rolling it out.

1           This is not the first time that the Commission  
2 has been involved in looking at infrastructure  
3 questions. In 2012, the Commission reached a settlement  
4 with NRG to -- that required NRG to build charging  
5 stations, fast charging stations, and to build make-  
6 ready infrastructure. And in December we reached the  
7 halfway point in that settlement process.

8           Looking at the data on where they are so far, we  
9 were expecting that NRG would have around 100 stations.  
10 That was the target for the two-year point. And at this  
11 point they have about 56 stations under the settlement,  
12 that are built as part of the settlement.

13           The settlement stations are required to have  
14 credit card readers that allow somebody to bill a  
15 charging event on their credit card when they pull up to  
16 the station. And they're also required to have SAE  
17 combo infrastructure as well. Less than have the  
18 stations have the SAE combo at this point, and only a  
19 handful of stations have the credit card swipe.

20           So at this point, really, they've completed 56,  
21 but looking at the requirements of the settlement, only  
22 a handful of these stations would actually meet the  
23 requirements of the settlement. So, there's a long way  
24 to go in that respect.

25           On the make-ready's, the target was to have

1 4,000 done by the end of -- by December of 2014.  
2 They've completed around 600, so they're around 15  
3 percent. So, we're behind on that.

4 I don't have an opportunity, now, to talk about  
5 why they're behind on that. I can say that we're in the  
6 process of hiring an auditor. The auditor will look at  
7 their performance and their spending on that, and that  
8 will help inform parties, and ourselves, about kind of  
9 where they are and what we want to do next on this.

10 But I think one of the -- different folks can  
11 have different reasons on why they're behind. We'll  
12 hear more from Terry on where they are on their  
13 progress.

14 But I think one of the things that we can all  
15 agree on is that the funding that's necessary for these  
16 is one challenge, but it's not the only critical  
17 challenge to rolling out infrastructure. There's a few  
18 other critical challenges. I think it's worthwhile  
19 thinking about those challenges to make sure we have the  
20 right strategy in place to make these investments work.

21 And I think what we should -- we often are  
22 talking a lot about the charging stations, themselves.  
23 But I think to be successful in this space, we probably  
24 want to focus a little bit more on what the needs we're  
25 trying to address are, and then kind of the operational

1 characteristics that we're using for the investments  
2 that we're making.

3           The infrastructure, itself, is important as  
4 well, but it kind of fits in with those other aspects  
5 that aren't always -- they don't always end up being the  
6 focus of these kind of conversations.

7           So, we look at what problem we're trying to  
8 solve. There's really two problems that infrastructure  
9 is aimed at addressing. One is a perceived need of  
10 potential EV buyers. And the other one is the real need  
11 of EV drivers.

12           So, when you talk to people who are considering  
13 buying a new vehicle or considering buying an electric  
14 vehicle, when you ask them what kind of infrastructure  
15 they think they need, they think they need a whole lot  
16 of infrastructure. At home, at work, and at most of the  
17 places they go. And they think that this is really  
18 critical for them to be able to meet their driving  
19 needs.

20           And as it turns out, as we see, the real need  
21 for charging infrastructure is mainly at your home, a  
22 little bit at your workplace, and less so in public  
23 spaces.

24           The average Californian drives around 35 miles a  
25 day, so the vehicles that are available right now can

1 easily meet that kind of average that we see.

2           The perceived need that we're seeing is  
3 basically irrational, but that's not saying that it's  
4 something that we should dismiss. It's actually really,  
5 really important because if we don't meet a customer's  
6 perceived need for infrastructure, then they're not  
7 going to buy the vehicle. And we never -- we don't have  
8 to necessarily even worry about the real need at that  
9 point. So, the perceived need is really critically  
10 important.

11           Both the real need and the perceived need are  
12 influenced by the technology that's available for the  
13 vehicles and to the charging stations, so those will  
14 change over time. So, that's an important thing that we  
15 have to understand to be able to meet these needs is  
16 that they will change.

17           And the perceived need is also influenced by  
18 just customers' perceptions of the vehicles, not  
19 necessarily just infrastructure. So, when we're looking  
20 at addressing the perceived need, it's also education  
21 and outreach programs that help us address that.

22           So, from these two needs we can identify kind of  
23 two goals that we're trying to address with charging  
24 investments. One is addressing PEV adoption, which is  
25 where we're addressing the perceived need. And then the



1 other one is increasing electric vehicle miles. And  
2 that's really aimed on what the real need for drivers  
3 is.

4 Some investments will do a better job at  
5 increasing PEV adoption. They'll do a better job at  
6 increasing awareness.

7 Some investments that we make will do a better  
8 job at increasing electric vehicle miles from hybrids,  
9 and things like that, and increasing the trips that  
10 people make from their PEVs.

11 Some infrastructure will actually do a good job  
12 at both of these. So, a next step from this point would  
13 be to think about what locations help us meet these  
14 different kinds of needs and where do we see the best  
15 opportunity to get the most benefit.

16 And as we're looking at the locations then, what  
17 becomes really critical is how we actually use that  
18 infrastructure, what the operational strategy for using  
19 that infrastructure is.

20 To make this work, whatever infrastructure we  
21 have in place needs to work for a site host and it also  
22 needs to work for the driver. So, we need solutions  
23 that work for both of them. If a driver really likes it  
24 and site hosts don't like it, then the site host won't  
25 install the infrastructure and we won't get it out,

1 regardless of how much money we put into it.

2           If site hosts like it and drivers don't like it,  
3 the drivers won't use it and, eventually, the site host  
4 will lose interest in installing it.

5           So, we need to spend some time thinking about  
6 what those operational characteristics are that make  
7 infrastructure work and help us meet those goals.

8           So, I listed a few different of what I think are  
9 kind of the critical operational questions.  
10 Authentication, proximity, user prioritization and grid  
11 prioritization.

12           The site host, these elements that we -- these  
13 four elements here have to work for the driver and they  
14 also have to work for the site host to make sure that  
15 they're both -- that this works for them. That we have  
16 a solution that works for both sides.

17           So, my suggestion would be, as we look at the  
18 type of investments and where we want to put the  
19 dollars, we should really focus on performance and focus  
20 a little less on technology. We should focus on  
21 defining what those needs are that we're trying to  
22 address, that perceived need and the real need. And  
23 then see where we want to address our infrastructure  
24 dollars toward one, or either one of those, or maybe  
25 toward both.

1           And then define performance metrics so we can  
2 understand how the infrastructure is actually helping us  
3 meet those different targets. How are we meeting those  
4 different needs? How are we impacting the perception,  
5 the perceived need in EV adoption?

6           A lot of those are really difficult, but if we  
7 spend some time thinking on that, it will help us make  
8 sure that our investments are maximizing their impact.

9           And then be mindful of the operational  
10 characteristics of the investments to make sure that  
11 these investments are actually working for both the site  
12 and for the driver.

13           And if we take this approach, it's kind of a  
14 technology agnostic approach. And as we do this, this  
15 will help us enable new technologies to come in the  
16 space.

17           And as Leslie mentioned, there's a lot of --  
18 this is a very dynamic space, we're seeing new  
19 technologies, new solutions. So, if we take this kind  
20 of approach, we'll be ready to incorporate those new  
21 solutions as they come to market.

22           And that's it. And I think we -- no questions  
23 at this point, is that -- okay.

24           MS. BAROODY: All right, Karen, you're here.

25 Hi, Karen. Karen Schkolnick from the Bay Area Air

1 Quality Management District just arrived and --  
2 actually, oh, I'm sorry, Terry O'Day. She's relieved.

3 Terry O'Day, from NRG, he's the Vice-President  
4 of NRG EV Services. And I'd like to welcome you up  
5 here.

6 MR. O'DAY: Thank you. I do have -- oh, I guess  
7 you want me to go there, okay.

8 All right, good morning everyone. I'm Terry  
9 O'Day and I'm with NRG Energy, and I direct our  
10 California programs.

11 I have a few slides to give you some more depth  
12 in understanding our build out in California, the  
13 commitment we made to the CPUC that Adam just covered,  
14 as well as how we're going beyond that and helping to  
15 solve problems for our automaker partners, utility  
16 partners, property owners and drivers to create the  
17 whole ecosystem that makes EV charging work well for  
18 all.

19 So, let's begin with the numbers. We all love  
20 to talk about how many numbers. And I think today  
21 you'll see a lot of different numbers as far as counts  
22 for DC charging. Most of them probably won't line up.  
23 And yet, they will all be sort of in the same direction.

24 We have, now -- the chart here, on this page,  
25 describes the process of -- or our construction

1 pipeline, rather. So, 59 energized Freedom Stations is  
2 the second to the last column on this chart, and a total  
3 in our pipeline of 119 Freedom Stations.

4 In addition, we have invested, and built, and  
5 networked additional stand-alone chargers, bringing us  
6 well over 120 chargers now energized statewide for DC,  
7 and 184 in our construction pipeline, at least.

8 I think that this represents, now, the largest  
9 fast charge network in each region listed and statewide,  
10 both by number of sites and I think, now, by number of  
11 chargers, though Tesla may correct me on that.

12 Being first has its advantages in part. It has  
13 some disadvantages. We've certainly learned some of the  
14 barriers and I'll address some of those along the way.

15 One that I think jumps out clearly here is that  
16 the size of the pipeline, the number of steps involved,  
17 the time it takes. Some of these projects, from go,  
18 take nine to 12 months to build, as we have learned.

19 And the steps along the way include host  
20 approvals for retail tenants and for landlords. It  
21 includes utility interconnection. It includes  
22 permitting. And so, the steps here represent the number  
23 of sites that have begun that process by ordering permit  
24 packages and submitted those into the jurisdictions.

25 But a couple of takeaways, importantly, for the

1 solicitation as we're looking to guide the CEC's next  
2 steps here. Fast charging stations are deployed,  
3 operational and utilized today.

4 The network that we have installed for DC  
5 charging is seeing quarter over quarter growth of more  
6 than 100 percent, now, for the last three quarters.

7 And secondly, there are -- it doesn't appear  
8 that there is a gap today in most of the regions where  
9 we've begun to build our network. And I'll show you  
10 where we are with some maps, in a moment, demonstrating  
11 the key metro coverage.

12 There are some needs in some smaller, rural  
13 metropolitan areas. And the smaller metropolitan areas,  
14 and rural areas like the Central Coast mountains, and in  
15 the Northern California stretch that some people call  
16 Jefferson, I understand.

17 But today, I'll conclude that I think this  
18 growing DC charging network is adequate when you  
19 consider the investment that we're continuing to make,  
20 the pipeline that you see here, the continued commitment  
21 that we've made to the CPUC.

22 And additional commitments, like the CEC's  
23 existing investments on the ground that are working  
24 through with our Air Quality Management Districts. The  
25 NEDO commitment that was mentioned, as well. And

1 automakers, like Nissan, BMW, and Volkswagen, and Tesla,  
2 who have all announced investments in DC charging. I  
3 think we see a really robust path forward.

4           Importantly, our Freedom Stations represent an  
5 installation of both CHAdeMO and combo charging  
6 technologies. We call it here the CCS, the combo  
7 charging system. Today, we have 47 of those installed  
8 in the ground, 33 of those went in as new Freedom  
9 Stations, 46 have received permits for retrofits. We  
10 have the similar pipeline of construction already  
11 completed and we're waiting on chargers to be delivered  
12 to install those chargers.

13           Here again, getting out first meant waiting for  
14 the technology partners to come along to provide the  
15 chargers.

16           But when we install a Freedom Station, we are  
17 typically installing two side-by-side chargers, up to 50  
18 kW that can operate simultaneously.

19           So, it also typically has a level 2 charger and  
20 a lighting solution, where needed, as pictured here in  
21 Carlsbad, at the Premium Outlets. This is about 150-  
22 kilowatt load that we install there, and requires  
23 significant utility coordination, and partner  
24 coordination, as well as the jurisdiction.

25           So, you can see a little bit more detail there.

1 On a rollout, we're catching up quite quickly. As you  
2 can see, we've got four installs scheduled just this  
3 week, alone.

4 Our pace across the state, now, is looking like  
5 about two to three new DC charging sites per week that  
6 we're installing. And so, most of those are Freedom  
7 Stations over the next -- over 2015.

8 And I know we love to look at maps, so here's  
9 some maps for us. I'll scroll briefly through these,  
10 but they should demonstrate a high degree of coverage in  
11 our metropolitan areas, and inclusive of low-income  
12 communities, which has been an important priority for  
13 us. Twenty percent of our Freedom Stations, now, are in  
14 low-income communities, as defined under our agreement  
15 with the CPUC.

16 And those districts are -- those sites are  
17 included on this map with a "P". Operational sites have  
18 a star. And under construction have the construction  
19 cone on them. Either of those would have a "P" to  
20 identify them as our low-income areas.

21 So, you see good regional coverage. There are a  
22 couple of gaps in these regions. We are now targeting  
23 those gaps in order to try to fill them in. They  
24 represent, in most cases, somewhat more difficult places  
25 to fill in.



1           For example, on the San Francisco map, you can  
2 see some difficulty in the peninsula. That's an older  
3 building stock there. It's more congested. And it is  
4 an example of some of the challenges you have.

5 Similarly, on the East Bay, there's a couple of  
6 corridors there.

7           Greater L.A. is getting built out nicely. We're  
8 now reaching from Ventura to Palm Springs, and this  
9 network now can drive -- it can a driver in, say a  
10 Nissan LEAF, from Ventura all the way to San Diego and  
11 Palm Springs.

12           There are a couple of gaps. Again, west side is  
13 an older housing stock, more congested. It's a little  
14 bit more difficult to convince a property owner to open  
15 up a parking space for this service. And stretches  
16 along, say, the Malibu Coast, some similar concerns.

17           But we've got some good coverage and excellent  
18 distribution into our lower income neighborhoods.

19           This, now, shows you all of the single DC  
20 chargers across all of our partner networks, as well.  
21 We've gone beyond the settlement agreement, now, to  
22 invest in EV deployment. So, when automakers,  
23 policymakers, or utilities, or property owners, or even  
24 technology partners have asked, we've stepped in to  
25 support deployment.

1           This has resulted in multiple sites with a  
2 single, stand-alone DC charger. These maps show those  
3 sites alongside our industry partners. They're not  
4 distinguished. Like Blink, Greenlots and ChargePoint,  
5 to give you a better view of the map of fast charging.

6           To get the full view, you have to take the map I  
7 just showed you, overlay it with this one. And you can  
8 see why I didn't do that, it creates a little bit of a  
9 mess when you do that. We have some nice coverage in  
10 these areas and more on the way. And that's what the  
11 map looks like for L.A.

12           So, given the question of how to consider how  
13 the state ought to invest in infrastructure funding with  
14 its next solicitation, our thinking is that it's  
15 important to consider the picture in three years. What  
16 we're learning is the development time line is  
17 significant. And by the time much of the infrastructure  
18 gets deployed, you're looking at three years already.

19           And the industry is shifting quite quickly.  
20 We'll see, in a few years, 200-mile-plus batteries are  
21 common for many of the vehicles that would be offered in  
22 the market. Many of our PHEVs are expecting to have DC  
23 charging. The first one, I think, is Mitsubishi that's  
24 announced their Pathfinder.

25           Renters and single-car families are going to

1 emerge as a very key market. We have talked for some  
2 time about the challenge of addressing this market and  
3 it will become more significant as we further saturate  
4 the single-family home market.

5           Used vehicles will also have an important market  
6 share. We're already seeing a meaningful number of  
7 LEAFs in the market that are resold.

8           So, focusing on areas lacking investment, as  
9 hard as it is, and we certainly have had difficulty in  
10 cracking multi-family. Like other infrastructure  
11 providers, I think it's critical that we figure out how  
12 to do this.

13           That means both by identifying buildings and  
14 identifying neighborhoods. Many folks who live in multi-  
15 family housing, and some of our early adopter  
16 communities, don't have a place to park reliably  
17 overnight, and so that means finding charging on the  
18 street in neighborhoods to serve those users. And  
19 that's where DC fast charging can also help to solve  
20 that problem.

21           Additionally, the municipal service territories,  
22 we've been investing in DC charging in those  
23 territories, but not level 2 charging. So, that remains  
24 an area, depending on the strategy or approach of the  
25 muni utility that's an area that lacks investment.

1           Also, super high-speed charging and larger  
2 charging centers appears to become more and more  
3 critical.

4           What we have found in the utilization data so  
5 far, with our fast charging, is that the -- are some  
6 counter intuitive findings. In particular, some centers  
7 that are Freedom Stations, in a mall, are performing  
8 less well than a stand-alone DC charger at a dealership.  
9 And they are within blocks of each other. And we think,  
10 well, you know, wouldn't you rather go to a mall, get  
11 yourself a cup of coffee or, you know, a shirt to bring  
12 home to your spouse or something like that right.

13           But as a driver thinks about it, we believe that  
14 the driver is concerned that there is going to be  
15 somebody on that charger. And that person might not  
16 come back, they'll disappear in the mall for a couple  
17 hours. When they go to a dealership they may -- they  
18 know that it's -- there's nowhere else to go. They're  
19 going to be on the property. There's going to be  
20 staffing there. So, we're finding that in some cases  
21 this is an issue.

22           There are strategies that we're deploying to get  
23 over the problem of a car parking too long, or getting  
24 iced at the malls. And those are technology solutions.

25           But fundamentally, investing in larger

1 supercenter charging, we think, like Tesla has done, is  
2 likely to overcome that problem because the sheer volume  
3 and throughput of those stations gives the driver  
4 confidence that they're not going to have that, face  
5 that concern.

6           Because even when you show up at that single  
7 dealership charger, you think you may run into somebody  
8 already plugged in there, and you may have to wait a  
9 half-hour. You may have somebody also lined up behind  
10 that person a half-hour. But at least you know how long  
11 that is.

12           So, getting past that problem we think means  
13 installing larger infrastructure.

14           We think anything that has a dwell time less  
15 than an hour is going to need DC charging, particularly  
16 as we get larger batteries into cars. And L-2 should be  
17 for those longer dwell sites, malls, theaters, venues,  
18 parks, as well as, of course, multi-family and work  
19 place.

20           I've listed some barriers and solutions. And  
21 I'm on the panel in a bit and I noticed my question  
22 addresses that, and I'm probably running out of some  
23 time here. So, I'll leave that there.

24           Critically, I think that, you know, what we're  
25 seeing is opportunities to fill in some gaps, but

1 particularly to address the market needs of workplace  
2 and multi-family charging going forward. Thanks.

3 (Applause)

4 MS. BAROODY: Thank you, Terry.

5 Next up we have Karen Schkolnick. She is the  
6 Air Quality Program Manager for the Bay Area Air Quality  
7 Management District. Welcome Karen.

8 MS. SCHKOLNICK: Good morning. Hi, everyone.  
9 I'm just going to go ahead and get started.

10 So, I'm Karen Schkolnick. I'm the Program  
11 Manager at the Bay Area Air Quality Management District.  
12 And I'm very pleased to be here with you, today.

13 So, let's see, blank screen. That one, thank  
14 you. No worries.

15 Okay, so here's a quick overview of what I'm  
16 going to be presenting. Today, just I'm going to very  
17 briefly do an introduction of the Bay Area Air Quality  
18 Management District for those of you that are not  
19 familiar with us.

20 And then, basically, tell you about our progress  
21 implementing the Bay Area's Plug-In Electric Vehicle or  
22 PEV Readiness Plan, and the status of our deployment.

23 So, for those of you that are not familiar with  
24 our agency, we were established in 1955. We're the  
25 second largest air district in the State of California,

1 after South Coast. We cover a nine-county area, and  
2 these are the counties that are within our jurisdiction.  
3 It's a pretty large area. It's over 5,000 square miles.  
4 And our population is over 7 million.

5 Our mission is to protect and improve public  
6 health, air quality and the global climate.

7 So, why is the Air District interested in  
8 electric vehicles? We've been interested in this  
9 technology for over 20 years. And we're really excited  
10 it about it now, now that it's becoming commercialized.

11 This is a picture, a typical scene for several  
12 hours on the Bay Bridge. WE are home to over 7 million  
13 people, as I mentioned, and those 7 million people drive  
14 over 5 million cars each day.

15 These vehicles emit about 40 percent of our  
16 greenhouse gases and over 25 percent of our air  
17 pollution.

18 So, in addition to where we're at now, our  
19 population is expected to grow over 2 million in the  
20 next 20 years. And in addition to that, the goods  
21 movement from our major cargo hubs is set to increase  
22 over 100 percent.

23 So, we really just see that mass adoption of  
24 plug-in electric vehicles, not only in the light-duty  
25 sector, but across all transportation is really critical

1 for our region to achieve our air quality improvement  
2 goals.

3           So, a little bit about those goals. The state,  
4 as you're aware, has set a target of one and a half  
5 million zero emission vehicles in California by 2025.  
6 And that aligns very closely with our own local goals by  
7 the Bay Area's 2010 Clean Air Plan, which sets a goal of  
8 over 100,000 plug-in hybrid vehicles or clean vehicles  
9 by 2020. And also, the conclusions in the recently  
10 adopted Bay Area Plug-In Electric Vehicle Plan that was  
11 co-sponsored by the California Energy Commission, which  
12 finds that at a minimum we need 250,000 plug-in electric  
13 vehicles by 2025.

14           So, incentive funding. One of the other  
15 conclusions of the Plug-In Electric Vehicle Plan is that  
16 incentives will be -- in addition to a lot of other  
17 factors, will be key to helping us to achieve our goals.

18           This is just a quick, sort of snapshot of the  
19 investment strategy for 2014, for the Bay Area Air  
20 Quality Management District.

21           Basically, the funding is primarily focused on  
22 mobile source projects that reduce or eliminate  
23 pollution from cars, trucks, marine vessels,  
24 locomotives, construction equipment and others.

25           And then, also, projects that basically get cars



1 off the road and reduce vehicle miles traveled through  
2 bike sharing, ride sharing, and other kinds of  
3 pedestrian improvement projects.

4           So, I mentioned the Plug-In Electric Vehicle  
5 Plan. I know a lot of folks in this room have  
6 participated in these efforts. And I see some folks  
7 from the Bay Area, who have also helped and participated  
8 in the development of this plan.

9           This plan was co-sponsored by the Department of  
10 Energy and also funded, in its second year, by the  
11 California Energy Commission. So, we're very  
12 appreciative of it.

13           Our Board adopted it in 2013, in December. And  
14 it basically -- again, it's the result of work of over  
15 two years' extensive research and analysis, in  
16 collaboration with our partners. And it covers best  
17 practices resources and provides a roadmap towards  
18 higher plug-in electric vehicle adoption.

19           It's organized into two main areas. One is  
20 strategies to accelerate adoption and the second is  
21 guidance for PEV readiness, which is mainly focused on  
22 strategies for local government. So, it contains a  
23 variety of recommendations related to building codes,  
24 permitting and inspection, local ordinances, et cetera.

25           One of the key elements of the PEV Readiness

1 Plan is our siting element. You see a little snapshot  
2 here on the right, which basically shows recommendations  
3 for what are the highest used corridors.

4 But the triangle on the left, many of you are  
5 familiar with it. Basically, it's just showing that  
6 most of the charging is going to happen at home. And  
7 that's what we see, we see that in the Bay Area more  
8 than 80 percent of charging happens at home. But a lot  
9 of charging will also need to happen away from home.

10 And so, again, this chart really just shows that  
11 the away-from-home charging is divided up into three  
12 areas. There's workplace charging, which is the second  
13 highest place where charging will happen. And then  
14 there will be opportunity and safety net charging, which  
15 fall under the sort of public charging category.

16 So, this slide is actually sort of the heart of  
17 this presentation. It basically shows the amount of  
18 public charging that is needed to support our plug-in  
19 electric vehicle forecast.

20 And the dotted blue line shows the PEV forecast,  
21 so you can see kind of what we project between now and  
22 2025, which is a quarter million PEVs. And then you  
23 also see the dotted orange line, which represents the  
24 estimated demand for publicly-available level 1 and 2  
25 charging, and to some extent DC fast charging.

1           What the chart shows, what we see here is that  
2 in the Bay Area we are currently above our projected  
3 forecast numbers for vehicles, but the infrastructure  
4 equipment that we have deployed to day isn't keeping up  
5 with the vehicles that we've deployed.

6           So, on the one hand it's a great story. We have  
7 over 41,000 plug-in electric vehicles in the Bay Area,  
8 so we're sort of ahead of schedule, if you will, on that  
9 front.

10           But the amount of infrastructure that we have,  
11 even though it's a lot, it's not keeping up with where  
12 we're at to date.

13           Just actually another quick point I'll just make  
14 here, while I'm on this slide, is an interesting thing  
15 to note, too, is there's been a lot of thought about  
16 what the split between battery electric vehicles and  
17 plug-in hybrids would be over time. And in the Bay  
18 Area, we see consistently that battery electric vehicles  
19 are still the dominant preferred vehicle of choice in  
20 the Bay Area.

21           So, right now we have a 62/38 percent split.  
22 And it actually is increasing in its dominance over  
23 time, which is unanticipated and interesting.

24           I would like to also just quickly point out some  
25 areas, we call them our Community Air Risk Evaluation,

1 or CARE areas, in the Bay Area. And they're essentially  
2 nine community areas that have been identified of  
3 disadvantaged communities that experience health  
4 disparities linked to air quality.

5 We monitor these and also seek to target our  
6 funding to these areas. And I just want to also  
7 recognize Terry O'Day, from NRG. Their project is  
8 deploying a lot of equipment in the Bay Area. They have  
9 a goal of 20 percent deployment in these areas.

10 Our Air Board has set a goal of 60 percent, but  
11 we really appreciate all of the efforts to help do more  
12 to ensure better air quality in the areas.

13 So, I mentioned that we have a lot of money for  
14 incentives. It's not enough, but we are very pleased  
15 with what we have been able to get support for plug-in  
16 electric vehicle technologies. Between 2014 and 2015 we  
17 have a goal of deploying -- or awarding almost \$13  
18 million of Air District funds for plug-in electric  
19 vehicle deployment and related projects.

20 One project that we have open right now, it's  
21 called our PEV Rebate Program for public agencies, where  
22 we provide funding in addition to the CRVP for battery  
23 electric vehicles, hydrogen fuel cells, zero emission  
24 vehicles, and motorcycles.

25 So, we provide \$2,500 for those and we also have

1 \$1,000 for plug-in hybrid electrics, and \$500 for  
2 neighborhood electric vehicles. And these are for  
3 purchase or lease.

4 We've had over 50 vehicles claimed so far by  
5 public agencies. And, interestingly enough, over 50 of  
6 them have been zero emission vehicles and I think we've  
7 only had three requests for plug-in hybrids. So, our  
8 percentages are growing for battery electric vehicles.

9 Another project that we're currently  
10 implementing right now, I also want to recognize, again,  
11 the California Energy Commission who, last year,  
12 provided funding for what we call the Bay Area Corridor  
13 Charging Expansion Project. Which is going to be  
14 deploying 10 DC fast chargers and co-locating 12 level 2  
15 chargers at six locations. So, this is a map that does  
16 show what those locations will be. And those chargers,  
17 hopefully, will be installed later this year.

18 So, what is coming soon? We have about \$11 and  
19 a half million left of the \$12.75 million, and so for  
20 that we're going to continue our PEV Rebate Program.

21 I was hoping today I could announce that it's  
22 open, but it's not open, yet, but it's coming soon. In  
23 February, we'll be opening our PEV Charger  
24 Infrastructure Program, where we'll be funding level 2  
25 and DC fast chargers.

1           These are going to be prioritized for places  
2 that are identified in the PEV Readiness Plan. So,  
3 these are essentially along primary transit corridors,  
4 workplaces, multi-family dwelling units, and other key  
5 destinations. And so, again, that's something that will  
6 open up in February.

7           We also, later this year, will be opening up a  
8 light duty vehicle fleet rebate program, if you will,  
9 for the private sector or high-mileage public vehicles.  
10 So, that will open, we hope, by March.

11           And then also, funding for zero emission heavy-  
12 duty vehicles and urban buses. And that will also open  
13 up in the next few months.

14           So, we have been asked to provide some thoughts  
15 about new opportunities. And so, in addition to  
16 everything that we've -- that I've discussed, that we're  
17 focused on, some of the things that we're still kind of  
18 trying to figure out how to do, that we look forward to  
19 discussing with you all later today, and through 2015,  
20 is to continue to figure out opportunities to site  
21 charging infrastructure at multi-family dwellings and  
22 certain workplaces.

23           We think that these are really key to moving the  
24 market forward and providing opportunities for all of  
25 our residents.

1           We also are very interested in level 1 charging.  
2   There's a lot of attention and most of our funding is  
3   going to DC fast charging and level 2 charging. But do  
4   think that for the amount of charging that will be  
5   needed to reach the vehicle counts that we need, there  
6   are many places where there is way more affordable  
7   opportunities to provide charging. And so, there is a  
8   role for level 1 and we'd like to get that back into the  
9   dialogue, in the conversation.

10           We also will be really interested in figuring  
11   out how to provide funding for areas where we can see  
12   that there's a need for charging to support the safety  
13   net, or for other reasons, but for whatever reason there  
14   may not be a business case for that charger. So, what  
15   do we do in those cases? How do we provide funding to  
16   those?

17           And then, finally, something that we're very  
18   interested in, that we have not done enough ourselves,  
19   but we will be looking to do more, is to figure out how  
20   to integrate battery storage technology and other  
21   renewable, and clean energy options related to charging.

22           So, in conclusion, I know that Leslie has  
23   already uploaded our presentation, so this is our  
24   contact information. Feel free to contact me or any of  
25   our staff in the Bay Area Quality Management District,

1 Linda Hui or Michael Neward, who work every single day  
2 on these programs and would be delighted to talk to you  
3 more about siting infrastructure in the Bay Area. Thank  
4 you.

5 (Applause)

6 MS. BAROODY: Thank you, Karen. Lots of great  
7 information there.

8 Next up, I would like to invite Patricia Kwan.  
9 She's with the South Coast Air Quality Management  
10 District. She is an Air Quality Specialist.

11 MS. KWAN: Thank you very much. Good morning.

12 So, I just wanted to talk about some of the work  
13 that we're doing here at South Coast. We are the  
14 largest air quality management district in California.  
15 We have the distinction of being in severe non-  
16 attainment, so that forces us to do more than other  
17 areas.

18 So, this is just kind of -- this is not a new  
19 story. This is one where you can kind of see where our  
20 daily peak air quality issues come into play, further  
21 into the San Fernando Valleys and then further east.  
22 And so, it's kind of a reminder of where we need to  
23 continue focusing our efforts in terms of air quality.

24 In terms of the top NOx sources in our region,  
25 you know, there are various source categories where we



1 definitely need to have significant reductions of 70 to  
2 90 percent in order to meet our upcoming air quality  
3 goals. And this also kind of affects or kind of helps  
4 prioritize our vision for clean air, and the need that  
5 we see to support a variety of alternative fuel  
6 technologies, on the fuel cell, battery electric plug-  
7 ins, hybrids. We see that clearly there's a need for  
8 all of these vehicles to be zero emission vehicles and  
9 so a variety of technologies need to come into play.

10 In terms of the activities we do on the PEV  
11 front, we are a funding agency. We do deployment, both  
12 of level 2 and DC fast charging. We do some  
13 demonstration projects on goods movement and fleet  
14 charging.

15 We've been involved with a number of agencies  
16 the state, and with AQMDs on PV readiness efforts.  
17 Notably, the DOE, Clean Cities Program-funded PV  
18 Readiness Project.

19 Other supporting activities, we also have the  
20 Rule 20202 that applies to large workplaces, and we're  
21 working on some sort of draft protocol with regard to  
22 that.

23 And then at our own headquarters we have over,  
24 at least 60 employees with plug-in electric vehicles and  
25 we have 25 chargers. So, you can just see right then

1 and there that we actually have our own challenges at  
2 the work site where we clearly have a lot of employees  
3 that are interested in these technologies, and we need  
4 to expand our facilities to give them an opportunity to  
5 charge.

6           So, this is, you know, your famous EPRI priority  
7 pyramid, the residential, the workplace, and then the  
8 public.

9           You know, we see at least in -- you know because  
10 of Rule 20202, and what we see at our own agency, that  
11 workplace is clearly a priority for us and one that we  
12 want to continue to try to incentivize.

13           In terms of deployment, some of our past  
14 programs. We've done level 2 deployment with all of the  
15 major EVSE providers, ChargePoint -- well, ecoTality,  
16 when it was ecoTality, Clipper Creek, we funded a number  
17 of level 2 installations there.

18           Under the SoCal EV Ready Program, we're working  
19 on about 300 level 2 installations, workplaces,  
20 destinations, universities, and that will be finished by  
21 June of this year.

22           And then DC fast charging, this with NRG eVgo,  
23 and Clean Fuel Connection, and it's a 26-EV fast charger  
24 site. This is in addition to the CPUC settlement, and  
25 it's one that we've been working very closely with eVgo

1 on, and we're excited to get moving on this.

2           So, in terms of the DC fast charging network,  
3 these are the sites that we've proposed to the CEC.  
4 There are some modifications that we are likely to do.  
5 And we really -- if we're going to go to the trouble of  
6 putting fast chargers in the ground, we really want to  
7 focus on high utilization sites.

8           We're also playing around with the idea of the  
9 super charging, multiple chargers per site for key  
10 locations. And we also are involving the UCLE Luskin  
11 Center in their site modeling efforts to help us refine  
12 our site selection, because we think that that's really  
13 key, along with all the other activity that's going on  
14 throughout California and the Los Angeles Region.

15           In addition, since I'm in a demonstration group,  
16 we have a number of goods movement, fleet-charging  
17 projects that we sponsor, funded by DOE, EPA, CEC, the  
18 Siemens Catenary Project. We've got some projects with  
19 UPS, and TransPower and other fleets.

20           And we see that in addition to the light-duty  
21 vehicle front, that's really important to incentivize  
22 plug-in electric vehicle technologies on the vehicle  
23 side and the infrastructure side for medium- and heavy-  
24 duty technologies, as well. So, we've been doing a lot  
25 of work at the ports and various goods movement centers.

**CALIFORNIA REPORTING, LLC**

52 Longwood Drive, San Rafael, California 94901 (415) 457-4417

1           And then this is just touching upon some of the  
2 work we did on the DOE PV Readiness Project, back in  
3 2012, 2013, along with Bay Area AQMD, all of the 12  
4 clean cities coalitions in California. We came up with  
5 a series of six, I would say, regional plans and a  
6 statewide kind of plan or integration. And we really  
7 had a common approach to these plans, which I think  
8 created a lot of additional value. So that these  
9 weren't six plans created in isolation, but they were  
10 actually ones that focused on certain key topics. You  
11 know, zoning, and permitting, and those kinds of issues.  
12 And so, that really kind of helped us to focus on sort  
13 of common issues to address.

14           As part of our Southern California PV Readiness  
15 Plan, we engaged the UCLA Luskin Center to develop this  
16 plan. And they also took kind of, also, a sub-regional  
17 approach. So, they looked at PV sales and  
18 infrastructure needs by a cog level. And so, we have a  
19 number of cogs in our Southern California area. And  
20 they created an atlas.

21           So, this has kind of served as an additional  
22 resource for cities, and counties and cogs to help in  
23 their PV planning so that they have kind of targets that  
24 are more specific for their areas.

25           This is just an example for the City of Los

1 Angeles. It's quite a heavy atlas, but it has a lot of  
2 information and resources, and it's helpful to introduce  
3 local governments into what they need to consider to  
4 install PV infrastructure.

5           This is just work that the PV Collaborative did.  
6 As part of our original PV readiness work, we really  
7 identified MUD and workplace charging as challenge  
8 areas. And so, the PV Collaborative took it on in two  
9 separate working groups, headed by their members, to  
10 kind of delve further into issues on MUD and workplace  
11 charging, and came up with two excellent sets of  
12 resources. Which I'm not going to go into because  
13 others have already touched upon this.

14           In addition, there are other supporting  
15 activities that we've done. We've done work with the  
16 South Bay Cities' COG on a BEV study. We've done with  
17 UC Davis in supporting their EV Research Center.

18           We are actually working on becoming a workplace  
19 charging ambassador for our own site, and that is work  
20 that is going to be taking place later this year. It's  
21 quite a major construction project, but we're very  
22 excited about that.

23           And then, we continue to engage with our local  
24 utilities. We work with LADWP, we also work with Edison  
25 on an EDTA.

1           And then this latest grant we just finished up  
2 is another DOE Clean Cities' Grant, which Bay Area AQMD  
3 is the lead agency, on alternative fuel best practices  
4 in the toolkit, which really builds on the PV readiness  
5 work.

6           So, I know we're running a little behind  
7 schedule, so I want to try to catch us up. So, I will  
8 just mention Rule 2202 is our large workplace rule. We  
9 try to encourage ride sharing or kind of, you know,  
10 various types of measures to reduce VMT. We have  
11 various compliance strategies, which includes purchasing  
12 PEVs and installing infrastructure.

13           We're in the process of revising our Rule 22  
14 emission reduction quantification protocol, and they're  
15 still taking comment. But the idea would be to try to  
16 allow sites that have, or will install EV infrastructure  
17 to somehow get credit for that, and so those details are  
18 still being worked out.

19           At our headquarters, you know, as I mentioned,  
20 we have about 25 level 2 and one DC fast charger. We  
21 are actually still evaluating proposals on hardware.  
22 We did initially release a proposal, but it turned out  
23 to be a little more complicated than we anticipated with  
24 our facility and all its needs.

25           There's a number of capabilities we want our

1 EVSE to have, so we're actually kind of stepping back a  
2 little and we're going to be doing some additional work,  
3 preparation work, releasing another RFP for installation  
4 and then moving forward with that later this year.

5           So, just from our own experience, there's quite  
6 a lot of challenges for workplaces to install charging.  
7 There's a lot of issues in terms of how much to charge  
8 for charging. How much -- how many chargers can you  
9 install. It seems like no matter how much you install  
10 it's never enough, especially if it's free, which it is  
11 at our worksite, until we transition into something  
12 that's a more cost recovery.

13           And then there are demand charges that our large  
14 facilities are hit with. So, we're looking at various  
15 kinds of solutions, such as battery storage, demand, you  
16 know, sort of response systems.

17           So, it's not just that we have all these  
18 employees come and the public come to charge, but that  
19 we need to manage those resources effectively.

20           So, whenever I think about anything on the PEV  
21 infrastructure vehicle front, to me there's always a lot  
22 of different types of issues to come into play. There's  
23 the technology, which has its own considerations.  
24 There's the market. There is -- if you're going to  
25 install infrastructure, how do you kind of manage that

1 resource.

2           Then there's policies, there's electricity  
3 rates, there's demand response, there's all sorts of  
4 issues to help untangle. And so, those are things that  
5 we are continuing to consider. And that, you know, we  
6 look forward to being part of the discussion today.

7 Thank you.

8           (Applause)

9           MS. BAROODY: Thank you, Patricia.

10           So, we are running a little behind. So, it is  
11 now 11:20, so we're already 20 minutes behind our 11:00  
12 panel.

13           I'd like to propose that we go until 12:15, and  
14 move everything back 15 minutes. So, we'll cut into our  
15 public comment time at 3:30. So, public comment will  
16 start at 3:45 and work backwards from there on the  
17 schedule.

18           Does that meet with everyone's agreement on the  
19 panel here? Okay, so we'll break for lunch at 12:15.

20           And I'm sorry, I'm not going to have time for  
21 questions right now, maybe toward the end of the day.  
22 But we just have a lot to cover.

23           So, at this time I'd like John Clint to start  
24 the panel, wherever you feel comfortable.

25           MR. CLINT: Well, good morning everybody,



1 welcome. My name is John Clint and I'm a Program  
2 Manager for a company called Alternative Energy Systems  
3 Consulting.

4 We've contracted with the CEC to provide  
5 technical policy assistance for the California's  
6 Statewide ZEV Infrastructure Plan.

7 I'd like to thank Commission staff for promoting  
8 and hosting this workshop. And I'd also like to thank  
9 our panelists for their valuable time and their  
10 participation.

11 So, I'll begin by going over the agenda. We are  
12 fortunate enough to have a large group of panel experts  
13 volunteer, but that means we're going to have to make  
14 things go pretty quickly if we want to get all the  
15 information in, so I'll try to keep it simple.

16 There will be three main sections to the  
17 session. First, we'll do a brief introduction, and I'll  
18 do that. Quickly, we'll transition into some targeted  
19 presentations.

20 The first presentation will be a gap analysis,  
21 led by UC Davis.

22 The second one will be some discussions of  
23 lessons learned on the West Coast Electric Highway, in  
24 Oregon and Washington. And that will be presented by  
25 AeroVironment.

1           And then, lastly, we'll have Caltrans talk for a  
2 few moments on partnering on infrastructure development.

3           After we finish those presentations, we'll move  
4 into the discussion portion. And that will be broken up  
5 into some very, very brief panel introductions and then  
6 panel discussion.

7           And at the end, we will allow public input.

8           MS. BAROODY: Thanks John.

9           Just a reminder to everyone on the panel, if you  
10 can get right close to your microphone so the people on  
11 the WebEx can register what you're saying. These mics  
12 have to be really right on top of --

13           MR. CLINT: Okay. Just a little background.  
14 The purpose of this session really is to elicit industry  
15 and public input as we seek to address the DC fast  
16 charger gaps on the West Coast Electric Highway and  
17 other important corridors.

18           I think it's also very important to note that  
19 this will help shape the next CEC solicitation, so  
20 that's important.

21           On the right side of the screen here we have the  
22 current map of the DC fast chargers, both planned and  
23 installed. And as you can see, at least in a  
24 geographical sense, there's still some pretty major gaps  
25 in the northern area, from Sacramento to Oregon, and

1 Central Coast, and in some other areas.

2           Okay, so I'll go ahead and jump right in to the  
3 discussion on gap analysis from UC Davis. Thank you,  
4 Mike.

5           MR. NICHOLAS: Thanks John, and thanks for the  
6 opportunity to speak here today, at the Energy  
7 Commission.

8           My name is Michael Nicholas. I'm a post-  
9 doctoral researcher at UC Davis. And I'll preface these  
10 remarks by saying that these are -- the results in these  
11 tools are created by -- or in these maps were created by  
12 tools that were funded by the CEC. And, you know, these  
13 are results, but the important point is that you can  
14 actually get these tools for free, from us.

15           It's more of instead of giving you fish, we're  
16 giving you the fishing pole. So, you can create these  
17 scenarios and then put in whatever you think is  
18 necessary.

19           So, for this, I'll also preface this by saying  
20 that DC fast charging, there's a continuum of fast  
21 charging needs and use cases, which Terry did a really  
22 good job of highlighting some of those.

23           And for this, we separated out only non-work  
24 trips and focused on the corridor aspect. But there are  
25 many different kinds of DC fast charging use cases. And

1 the fast charging in the corridors, a lot of times  
2 they'll integrate with some of the other fast charging  
3 uses, such as people with level 1 in their home, they  
4 need to fast charge.

5           And then you'll see some destination fast  
6 charging, such as people going to San Francisco and they  
7 can't find a level 2 chargers. They have enough time to  
8 charge, but there just isn't the level 2 network out  
9 there.

10           So this, specifically, is looking more at  
11 geographic gaps and also highlight another thing that  
12 Terry introduced is what happens in three years when we  
13 have short-range PEVs, such as we do now, up to BEV 80s.  
14 Tesla's kind of got their own network and I guess  
15 they're going to be able to use CHAdEMO technology  
16 coming up pretty quick.

17           But this is a geographic map. And gosh, these  
18 kind of look the same. Actually, it zoomed out a bit  
19 more, now that I'm looking at it.

20           But on the left, you see the current scenario  
21 where we have, basically, BEV 80s, with the current  
22 distribution. So, where are the vehicles now, and then  
23 where does the demand show up?

24           Because people, in our surveys, say that they do  
25 not want to stop more than a certain number of times.

1 So, if you have a BEV 80, and you're going to take a  
2 trip to L.A., you're probably not going to take your  
3 LEAF.

4 And so, in the model we have, we de-emphasize  
5 that long-distance demand for unlikely trips.

6 And just on the very bottom of the map you can  
7 see on I-5 is the most striking difference. Where, for  
8 the current scenario, you see going I-5 north, I guess  
9 we'll look at that one, it's the easiest one to see.  
10 It's if you have short-range vehicles, you're not going  
11 to see much demand on a corridor. And you would see  
12 demand on maybe alternative corridors, like 99, going up  
13 towards Yuba City.

14 And similarly, for going south, you don't see  
15 demand on the current scenario. But on the future  
16 scenario you see demand from larger vehicles. And in  
17 that scenario we have BEV 300s and BEV 150s.

18 And so, it's kind of important to point out  
19 that, you know, what time scale are we talking about for  
20 these corridors? In the current scenario, we probably  
21 need to focus on different areas than we do in the  
22 future. And are you building for the future or are you  
23 building for now, or now and in the future?

24 So, I'd just like to introduce that into the  
25 discussion.

1           And then, also, this highlights more geographic  
2 gaps. And I should also say that given the locations of  
3 all the red dots, where are those areas where people  
4 take likely trips and what are those hot spots?

5           And so you see down in Gilroy, from San Jose to  
6 Gilroy is a hot spot. Going down to Santa Cruz, those  
7 are hot spots. And going over to Livermore, that's a  
8 hot spot currently, and they continue to be hot spots.

9           And so those are areas that right now, with  
10 today's current vehicles, you find people taking the  
11 appropriate trips where they would -- and they own  
12 vehicles in the areas that we've looked at.

13           So, that's -- that's that one. And there's a  
14 series of maps, and let's go to the next map. Where are  
15 those places in the future?

16           If you look at kind of the current scenario,  
17 it's hard to see with all the dots. But right now, you  
18 probably wouldn't see any demand going through Las Vegas  
19 in the current scenario, but in the future you would see  
20 demand. And so, it's a matter of time scale and what  
21 you believe the technology to be.

22           And similarly, you know, going up I-5 you see  
23 less in the current scenario than in the future  
24 scenario.

25           And let's see, yeah, Central Coast. And then

1 you can see here that's the I-5 scenario there. You  
2 wouldn't see much demand. So, if you put a fast charger  
3 in the middle of I-5, now, you're probably not going to  
4 see people with LEAFs showing up, so for current  
5 drivers.

6 And I guess the point is you don't need to go  
7 through all of these, but I guess on this one it's  
8 important to point out that 99, you do see demand now,  
9 and in the future. So, it could be one of the different  
10 things. So, if you're looking at gaps, there are gaps  
11 now on 99, but not on I-5.

12 And then let's go to the Northern California  
13 and, again, I-5 shows up only in the future scenario as  
14 kind of an important thing.

15 And I'll say what this is built on is people  
16 taking gasoline trips. I shouldn't have said that.  
17 There's a lot more that goes into this. And please give  
18 me your name, if you'd like to be included on a webinar.  
19 We're going to be giving a training on the tool, if  
20 you'd like to use it.

21 This is based on people taking gasoline trips.  
22 This is the Caltrans dataset. So, 42,000 people were --  
23 they filled out a diary and said where did they go, and  
24 the frequency with which they took these long trips is  
25 reflected in this, and the scaling is all done by

1 Caltrans.

2           So, that's all I have to say about gaps. But  
3 there are geographic gaps and there are capacity gaps.  
4 And just because you have a dot there doesn't mean  
5 you'll have enough chargers. You have one charger, but  
6 then it's full of people. As Terry was saying,  
7 congestion is an issue. People will stop taking that  
8 trip if it's not enough, if there's capacity gaps and  
9 geographic gaps.

10           This mostly shows the geographic gaps, but with  
11 the tool you can explore those things and look for the  
12 capacity gaps, as well.

13           So, I'll leave it there and I think that's five  
14 minutes.

15           MR. CLINT: Thank you.

16           Well, Charlie, Can you tell us everything you  
17 know in five minutes about Washington and Oregon?

18           MR. BOTSFORD: Sure. I'm Charlie Botsford. I'm  
19 the Project Manager for the West Coast Electric Highway.  
20 I work very closely -- the West Coast Electric Highway  
21 comprises 55 stations in Oregon and Washington. I work  
22 very closely with Tonia Buell, of WSDOT, and Ashley  
23 Horvat of ODOT. So, two departments of transportation.  
24 Oregon has 43 stations and Washington has 12 stations.

25           So, it's an interesting, been an interesting



1 venture. One of the things that you have to ask  
2 yourself is, you know, after you identify a gap, you  
3 know, that's kind of the beginning. Then what do you do  
4 with that gap, how do you actually fill it?

5           And so, what we identified was 25 miles between  
6 stations was kind of a -- so it was more of a geographic  
7 type venture.

8           The West Coast Electric Highway is on the I-5  
9 corridor and the 101 corridor in Oregon and Washington,  
10 and a few other state routes, as well.

11           And Terry mentioned earlier that he had, I  
12 think, a one-year time period. One of our stations took  
13 two years to develop. It was on Forest Service  
14 property. Don't ever, whatever you do, put something on  
15 government property, especially Forest Service. That  
16 was Mt. Hood Ski Resort, so it was really, really  
17 difficult.

18           So, I can give you all kinds of horror stories,  
19 war stories about siting fast chargers, and getting into  
20 lease agreements. A lot of it has to do with why, you  
21 know, what's the motivation for putting a fast charger  
22 at a particular site. And, you know, because the  
23 business model is -- to say that it's weak is an  
24 understatement. It's even weaker, by the way, for level  
25 2. But for DC fast chargers, it's a pretty weak

1 business model.

2           Actually, the best business model that I've seen  
3 so far is Tesla and they do it for completely different,  
4 self-serving reason, purely for the convenience of their  
5 drivers. Wow, what an idea.

6           So, yeah, I can get into all kinds of details,  
7 stats. I deal with 22 separate utilities. We get  
8 bills -- so AeroVironment owns and operates the  
9 stations, so we get 22 separate utility bills. We get,  
10 man, some of the utilities have demand charges.  
11 Fortunately, not -- that isn't as much of a problem in  
12 the Pacific Northwest as it would be in California.

13           So, if you go to site some DC fast chargers in  
14 areas in California, you're going to run into  
15 significant issues with demand charges and that will  
16 just -- I mean, if you want to talk about running a  
17 business case, that will start it right there.

18           What else? I don't know, all kinds of stats.  
19 If anybody wants to ask questions about the West Coast  
20 Electric Highway.

21           Oh, yeah, there's definitely a difference  
22 between geographical demand and other type of demand.  
23 If you look, for instance, at the corridor from Ashland,  
24 Oregon down to Sacramento, there's nothing there.

25           You to trans-site a station anywhere in there,

1 it's difficulty. Maybe you could put one in Redding,  
2 you know, or Mt. Shasta. But trying to do it every 25  
3 miles, it's difficult. So, you don't do it to make  
4 money, you would do it as a utility, as something of  
5 convenience to the driver. And that's not a money-  
6 making proposition, so it's something that maybe it's a  
7 state-funded proposition. I don't know.

8           So, that's some of my words of wisdom.

9           MR. CLINT: Thank you, Charlie.

10           Okay, so now we'll go to Caltrans and they'll  
11 talk a little bit about partnering on infrastructure  
12 development.

13           MR. MATSUO: Hi, my name is Jeremy Matsuo. I'm  
14 with Caltrans. I entered the EV charging discussion  
15 from our fleet aspect.

16           So, at Caltrans we've started getting plug-in  
17 electric vehicles and we started seeing the need for  
18 charging stations for our operators of these EVs  
19 throughout the state, and recognized there's a gap. And  
20 so, that's what brought us to opening up the  
21 conversation and partnering with other people, and  
22 seeing how we can not only service our own fleet, but as  
23 well as, you know, meet the goals of the state in  
24 reducing emissions and including incentivizing the  
25 adoption of EVs.

1           So, we've kind of now taken a more -- a wider  
2 approach to implementation of our charging network. And  
3 we're also looking to partner with people. So, our  
4 planning division has been in talks, you know, for a  
5 while now about incorporating alternate fuels within  
6 Caltrans planning efforts as we move forward.

7           And we're in conversation with Leslie's group on  
8 how we can help with the West Coast Electric Highway,  
9 and other partner ideas.

10           And, you know, there's other things we've talked  
11 about. People have even talked about perceived needs.  
12 And so, there's other things that Caltrans sees as a  
13 possibility of things it can do. Something as simple as  
14 if there are charging stations in the area, signage  
15 along the highways and the freeways just to let people  
16 know they're there would help adoption by the public,  
17 just by driving along and noticing, as they drive their  
18 gas vehicle, that they see more and more charging  
19 stations at every exit. The signs are there and saying,  
20 hey, there's a charging station.

21           So, there's a lot of things we're looking at and  
22 we're going to start improving and hoping to advance  
23 technology. I mean, it is all driving from the  
24 Executive Order 1612 and the ZEV Action Plan. So, it's  
25 multi-faceted and we're happy to be joining the panel

1 and being a part of this technology.

2 That's going to save you some time.

3 MR. CLINT: Thank you.

4 Okay, so now we've arrived at the discussion  
5 format section. Just to give us a little bit of  
6 context, one thing I want to mention up front is the  
7 discussion should focus on areas that the speaker feels  
8 are important for the Commission to consider in  
9 developing the new solicitation. That's kind of our  
10 purpose.

11 So, I'd like to do a brief panelist introduction  
12 for those folks we haven't yet met. And if you could,  
13 give me your name, title, affiliation, and then the 30-  
14 second overview of your organization's involvement with  
15 the DC/FC infrastructure.

16 So, we'll go ahead and start with you, Bill.

17 MR. BOYCE: Bill Boyce, I'm the Supervisor of  
18 the Electric Transportation Group with the Sacramento  
19 Municipal Utility District.

20 We've had an active electric transportation  
21 program for over 25 years. We currently are in the  
22 process of installing DC fast charging network in the  
23 Sacramento area and have also been pretty key in  
24 supporting a lot of the readiness planning for the  
25 region.

1           MR. HAUSER: Good morning, my name is Brett  
2 Hauser, CEO of Greenlots. To date, according to plug  
3 share, there's about 1,200 DC fast chargers in North  
4 America. Greenlots, by the end of Q1, will be operating  
5 325 of those. We have, specifically in California, 51  
6 DC fast chargers located here.

7           MR. TRAN: My name is Lloyd Tran. I'm the  
8 Managing Director of U.S. Green Vehicle Council.  
9 Recently, we have been awarded a grant under PONS of  
10 13606 to design and to install 10 DC fast chargers from  
11 the corridor freeway, from I-5, and CA-99 from Stockton,  
12 Merced, Fresno, Tulare. On 5 we're going from Santa  
13 Nella, Lost Hills, Lebec, Santa Clarita, and then all  
14 the way through Oceanside, that are going to help to  
15 fill the gap along the Central Valley. We think this is  
16 a very well-elected area, even though we discussed that  
17 may not be important, but I think it is important for us  
18 to start the infrastructure.

19           And I would be glad to discuss with my  
20 colleagues, as well, how we can work together to achieve  
21 that goal. Thank you.

22           MR. NICHOLAS: Yeah, I kind of already  
23 introduced myself, but I'd just say also that we do a  
24 lot of consumer studies. At the Institute of  
25 Transportation Studies we do focus on the consumer and

1 the behaviors surrounding electric vehicles, including  
2 DC fast.

3 MR. PETERSON: So, David Peterson. I manage the  
4 Western U.S. for EV infrastructure and business  
5 development activities. And Nissan has directly been  
6 investing in DC fast charging now for several years.  
7 And we're on track to hit about 1,000 DC fast chargers  
8 across the United States. These are CHAdeMO DC fast  
9 chargers across the United States, early this year.

10 And we've built some programs around it. We're  
11 very excited to have launched last year, here in several  
12 California markets, the no-charge charge program, which  
13 offers free charging for two years, free public charging  
14 for two years to Nissan LEAF customers. And this is  
15 primarily built around DC fast charging, which we feel  
16 is a key differentiator for our product and, also, part  
17 of the great driving experience we'd like to create for  
18 our customers.

19 MR. KELLEY: My name is Steve Kelley and I'm  
20 Senior Vice President at Green Charge Networks. Our  
21 affiliation in the past, with the CEC, is we were  
22 fortunate to be awarded a grant to test and implement DC  
23 fast charging and intelligent energy storage, with the  
24 main goal of reducing some of the key barriers that  
25 people were seeing in installing them. Which is cost of

1 the equipment, the installation, and the impact on  
2 demand charges.

3 We're fortunate that we've extended that grant  
4 into a commercialized product. We have partnered with  
5 folks like eVgo, ChargePoint, Nissan. And we are now  
6 deploying the combination of EV charging and intelligent  
7 energy storage at no cost to customers and, in many  
8 cases, we're able to create significant savings for the  
9 building. So, that's our involvement here.

10 MS. SMART: Hi, I'm Anne Smart. I'm the  
11 Director of Government Relations and Regulatory Affairs  
12 at ChargePoint. We may be best known for our level 2  
13 product. We've got more than 20,000 charging locations  
14 across the country.

15 But we do have, also, 100 DC fast chargers  
16 rolled out through our on-ramp partners.

17 And last week, at the Washington Auto Show, we  
18 announced a partnership with BMW and Volkswagen to roll  
19 out another 100 DC fast chargers, some of which will be  
20 combo, some of which will be combo and CHAdeMo, over the  
21 next year. So, that's why we're here.

22 MR. CLINT: Well, thank you, everybody.

23 Okay, so now we've come to the panel expert  
24 discussion. And with the help of CEC staff, we've  
25 identified seven key questions and we'd like to get



1 through all of them.

2           So, in our opinion, the best use of expert time  
3 is to take these seven questions and we've pre-selected  
4 a lead-in speaker. So, what we'll do is we're going to  
5 let them respond to each question and we'll get through  
6 all seven questions.

7           And then, at the end of that, we'll come back to  
8 the panel and have them respond to any one of the  
9 questions that they want to add additional information  
10 to.

11           And then, after we finish that it will be public  
12 discussion and we'll open it up to the public for any  
13 questions, or other areas as well.

14           Okay, so the first question we have is what  
15 defines a corridor? And, specifically, in terms of  
16 solicitation.

17           And Mike, I think we've tagged you to talk about  
18 that.

19           MR. NICHOLAS: Okay, yeah, so I gave a little  
20 bit of a preview with the introduction. But what  
21 defines a corridor? I think it's important to -- in one  
22 respect do we give -- in terms of the solicitation, if  
23 there are many needs for what we're trying to  
24 accomplish.

25           With a corridor, specifically you're trying to

1 expand the range of an EV owner's territory. So, where  
2 can they go with their EV? They live in -- let's say  
3 they live in Sacramento and what are the possibilities  
4 that I can do with my vehicle?

5 That's one use case for fast chargers. And I  
6 guess that's kind of an open question, is that the only  
7 thing we're trying to accomplish with this and are we  
8 trying to -- I don't think we're going to displace too  
9 many miles, necessarily. It's more -- corridor fast  
10 charging is more about giving access for most people, I  
11 would say.

12 But also just highlighting, as I said before,  
13 all these other use cases for fast charging. So, let's  
14 say you had some fast charging in San Francisco, it  
15 could be both a fast charger for workplaces, people who  
16 couldn't find level 2, or a destination fast charger  
17 could be a fast charger for people going along 101, down  
18 the peninsula.

19 And the same thing with Sacramento. You could  
20 imagine that being, you know, a corridor fast charger  
21 for people going to Tahoe, but also being a destination,  
22 workplace, even maybe a home charger in some cases.

23 And so, I guess one of the questions in my mind  
24 was do you get extra points for those things? Or are we  
25 looking specifically at the issue of expanding territory

1 and, you know, filling in those geographic places on the  
2 map, kind of like I was showing those hot spots where  
3 people would want to use it to get farther in their  
4 cars.

5 And it brings to mind the conversation about DC  
6 fast charging has evolved from people thinking that was  
7 the only use case for fast charging, into people saying,  
8 well, you know, you could use fast charging any time.  
9 It could be a replacement for level 1 and level 2.

10 You know, how are we thinking about it and I  
11 guess what are we going for in this solicitation is kind  
12 my -- I guess my question. So, things to think about.

13 MR. CLINT: Thank you.

14 Okay, the second question, where are the gaps in  
15 the highway corridors and what does that mean, exactly?

16 Charlie?

17 MR. BOTSFORD: Sure. So, again, I mentioned  
18 that the -- one of the constraints for the West Coast  
19 Electric Highway was every 25 miles was the goal to have  
20 a station. So, how do you identify the gap? Not a big  
21 deal, you just put a station every 25 miles. Okay,  
22 sometimes that works.

23 Right now we're working on the Brookings  
24 Station, which is at the end of the 101, right above the  
25 California border, still in Oregon. So, between

1 Brookings and Port Orford, I think it's like 50 miles.  
2 I don't remember. But trying to put, you know, again,  
3 if you look at from Ashland, Oregon down to Sacramento  
4 on the I-5, if you try to put a station every 25 miles  
5 that's a real challenge. Because identifying the gap,  
6 sure. But here, we need a station right there. And you  
7 can pinpoint it on the map, but on the map there's  
8 nothing there.

9           And so, you look at some of the constraints that  
10 we looked at, or that we're under for the West Coast  
11 Electric Highway which is, well, number one, you kind of  
12 like to have three-phase power. That's really useful.  
13 480 volt, three-phase power, we can even deal with 28  
14 volt, three-phase power. But power, you've got to have  
15 power.

16           It's nice to have it at a venue that's got 24-  
17 hour accessibility, safety reasons. You know, something  
18 to do, you know, a restaurant. Site accessibility.

19           We run into things, just as part of the  
20 constraints that we run into with Oregon and Washington  
21 dealing with government agencies. We have to worry  
22 about site remediation and, you know, soil remediation  
23 and making sure that, you know, when we do  
24 construction -- because these are constructions projects  
25 and you've got to make sure that you do everything

1 environmentally correctly.

2           So, let's see, what else? Site parking. Oh,  
3 yes, the parking has to be ADA compliant. Signage, I  
4 mean all of this stuff is -- there's a three-page list  
5 of things that you have to take care of when you site a  
6 station.

7           So, once you get a station sited, that's a big  
8 deal. So, kudos to NRG for all the work that they've  
9 done on the California settlement agreement. Because  
10 siting a station, big deal.

11           So, pinpointing the gap, not that big a deal.  
12 Actually getting a station there, that's the hard part.

13           MR. CLINT: Kind of a follow-on question,  
14 Charlie, what does it mean to fill a gap?

15           MR. BOTSFORD: Well, you know, the Western  
16 States, Oregon, Washington, California, they're a long  
17 ways that you can drive.

18           MR. CLINT: Right.

19           MR. BOTSFORD: And some cars, you know, EVs, if  
20 you can only go 60, or 70 miles, or 80 miles on a  
21 charge, once you get down to like 30 or 40 percent state  
22 of charge, you're starting to look pretty closely at  
23 where is the next station so I can fill up. So, that's  
24 where you start trying to figure out about gaps.

25           MR. CLINT: Okay, and demand comes into that as

1 well.

2 MR. BOTSFORD: Yeah, demand comes into that as  
3 well. You know, a lot of the discussion about demand  
4 has been, well, where are the cars? And by the way,  
5 that feeds really largely into the business model. Like  
6 for instance, ECotality who has -- or not ECotality.  
7 Car Charging Group took over ECotality. They have  
8 Portland and Seattle metropolitan areas, which are  
9 thought to be widely used stations, as opposed to the  
10 West Coast Electric Highway, which is a corridor model.  
11 So, it's a big difference in why you site stations and  
12 what a station is all about.

13 MR. CLINT: Okay, the third question is what do  
14 current and prospective PEV drivers need? Anne, did you  
15 want to jump in on that?

16 MS. SMART: Sure, thanks for having me. So, I  
17 think a few of the speakers now have mentioned some  
18 struggles with siting stations.

19 So, I think number one for drivers is location.  
20 For any funding opportunity that's available, I think  
21 it's very important that we make sure that we're not  
22 overly restricting the types of locations, particularly  
23 for DC fast chargers. There's definitely intra-city and  
24 inter-city applications. Drivers should have the choice  
25 and ability to fit this into their normal charging

1 needs.

2           From a technology perspective, that would mean  
3 having both 24 kW and 50 kW technology available. But I  
4 think overall for the driver, again that means that you  
5 have multiple options and multiple locations so that we  
6 don't over-restrict that and can definitely get these  
7 sited quickly.

8           My second thing would be compatibility with all  
9 vehicles. As I mentioned, our BMW/Volkswagen  
10 partnership will include stations that are dual-  
11 connector, with SAE and CHAdeMO. They'll also have  
12 level 2 connectors, which further expands the number of  
13 vehicles that can use that location. I think that's  
14 important. And for any funding opportunity it shouldn't  
15 be restricted to certain vehicles in any possible way.

16           And then, thirdly, of course from ChargePoint we  
17 want to make sure that everything is networked. That  
18 our drivers are able to easily find the station and that  
19 it's also easy to service. That we're not investing in  
20 anything that's getting rolled out that no one can find,  
21 and breaks quickly that no one can fix it.

22           So, from driver perspective, it's very important  
23 that they can find the station, but also find if it's  
24 available. As has been mentioned, you need the parking  
25 spot next to it, so people can wait for it. But

1 anything that can show that the station is there, who's  
2 using it, when it's going to be available next, all of  
3 these things will really help make this smoother for the  
4 driver moving forward. Thanks.

5 MR. CLINT: And then, Brett, would you like to  
6 add to that, please?

7 MR. HAUSER: Sure. I thought I'd start off by  
8 sharing some statistics, what we're seeing with usage in  
9 our network.

10 When a charge station or DC fast charger is  
11 close to a major highway, or is a pay -- a pay-for-use,  
12 as opposed to free, peak time of day seems to be between  
13 3:00 and 4:00 p.m. And the average length of that  
14 session, the duration is about 18 minutes.

15 However, when a charge station is free, the peak  
16 usage actually happens in the morning and at lunchtime.

17 And we find in order for folks to use it, and  
18 this has been talked about for a number of years, in  
19 terms of what will incent someone to use a public charge  
20 station as opposed to at home? The price has to be  
21 probably between a 20, 25 percent delta of what they're  
22 paying for their home charging. Otherwise, they're not  
23 going to make use of any of the infrastructure.

24 And to Green Charge Network's point, we're  
25 seeing a lot of opportunity to help the site hosts lower



1 their overall cost for demand charges and pass those  
2 savings on to the drivers, that battery energy storage  
3 with the DC fast charging is very helpful.

4 I thought it was interesting to note that the  
5 most highly used station in our network is, of course,  
6 free and it's got an average of 14 sessions per day, but  
7 it is free.

8 Some other things that I thought were  
9 interesting to share, actually just from plug-in side,  
10 from PlugShare. I mean, a couple of things that they  
11 have been talking about, recently, in terms of driver  
12 satisfaction or dissatisfaction is the confidence in  
13 knowing that wherever they're going, that if they're  
14 trying to plan a trip that is of significant range that  
15 there is a great risk that that charge station, when  
16 they get there, is either not going to be available or,  
17 in fact, will be broken.

18 I think, as a matter of fact, when they  
19 surveyed, I think it was about 547 drivers, those  
20 drivers that were Tesla drivers, 93 percent of those  
21 drivers actually had confidence that that charge station  
22 would be up. But all others it was down to 33 percent.  
23 Okay, I mean and that's on all of us.

24 And I think one of the issues that we have in  
25 the industry is making sure that the hardware we're

1 putting out is not only reliable, but that we have the  
2 proper service and maintenance programs in place.  
3 Because we are in a B-to-C business. And I think part  
4 of the transition has been for these hardware equipment  
5 manufacturers, who are used to B-to-B deliveries and  
6 response times.

7           And so, there's been an education that's had to  
8 happen throughout the industry as they realize, hey, a  
9 charge station's down? You're going to know about it,  
10 we're going to know about it, we've got to get that  
11 thing fixed very quickly.

12           The other thing that I think we also have to  
13 address with this is interoperability. And, of course,  
14 there's the back end and that's from the site host side  
15 where you want to have flexibility in being able to buy  
16 any charge station, and put it with a different back  
17 end. That's why we always supported OCCP. As with  
18 probably a couple of others, probably use five or six  
19 different hardware providers because of the flexibility  
20 OCCP provides.

21           But there's the driver side, and the driver  
22 roaming. And Nissan has taken a leadership position  
23 with EZ Charge, which a lot of the major networks are a  
24 part of. But they need our help, and all of our help,  
25 to try to break down the barriers between networks so

1 that it can be a seamless driving experience for the EV  
2 owner.

3 And right now is a very siloed type of  
4 experience. And there's a lot of risks going forward  
5 that in order to get this seamless experience there will  
6 be a lot of roaming fees, and other unnecessary charges  
7 put on a driver who wants to have one primary car and  
8 use someone else's charge station.

9 And that's going to have the exact opposite  
10 effect of what we're trying to do. We're trying to  
11 build markets, make markets, make new drivers. And  
12 drivers are very price sensitive to the cost of what  
13 we're paying. And if we make it difficult for them to  
14 charge, we won't have any drivers.

15 So, I think we need to be paying a large amount  
16 of focus and effort on making sure that the  
17 interoperability works as it should. An even playing  
18 field for everybody, where the driver benefits.

19 MR. CLINT: Thank you.

20 Terry, can you talk to us a little bit about  
21 what are some of the barriers to optimal siting and some  
22 of the potential solutions?:

23 MR. O'DAY: Sure thing. My cousin, Charlie,  
24 already identified a few of them, so I appreciate that.

25 The question, of course, I think when we're

1 talking about corridors, one thing to keep in mind we're  
2 probably, as Mike I think described, talking more about  
3 perception than reality of need. And that kind of goes  
4 back to Adam Langton's chart that he offered earlier.

5           And to the extent Tesla's already had success in  
6 developing these corridor networks, it's not as much  
7 because everybody wants to drive intercity, but rather  
8 that people walk into dealerships and they say, okay,  
9 wait a minute. So, I buy this electric car and I'm in  
10 Los Angeles, how do I get to Las Vegas?

11           And, of course, the right answer is take a  
12 plane. It's like the most dangerous drive --

13           (Laughter)

14           MR. O'DAY: It's one of the most dangerous  
15 drives in the country.

16           But here we are trying to sell cars and that's  
17 why I think we're trying to build corridors for  
18 charging. And the barriers to develop those are, in  
19 part, directed by these purposes.

20           So, we need them to be fast, obviously, because  
21 the likelihood is you're going to use multiple charging  
22 stations to complete your drive in most of the vehicles,  
23 for most of the corridors we're talking about.

24           They need to be safe. You know, we need to plan  
25 these stations to consider this edge case of a single

1 mom, with two kids, at 11:00 at night, in rural Northern  
2 California, when it's raining. And that station better  
3 work because we took -- we convinced that driver to come  
4 out to that station in the middle of a rural community.

5 That means it also has to be available. You  
6 know, a single charger, with a car on it, if they move  
7 right off the charger when they're done this question,  
8 Mike says, of congestion is important because it  
9 instantly doubles your dwell time at that station. And  
10 that's if they come right back to the car.

11 And so then that's the question of what are they  
12 doing there? What else is going on while you're  
13 charging? Do you have something to occupy your time.

14 So, barriers to development that flow from  
15 those, if it needs to be fast and it needs to be  
16 available, it needs to have meaningful electrical  
17 infrastructure.

18 And so, that means having redundancy in the  
19 chargers. As Brett mentioned, a lot of the charging  
20 stations go down a lot of times. We're still dealing  
21 with new technology. I think we have six, five or six  
22 DC chargers now, operating on our network. They work to  
23 different degrees and have different needs. They're all  
24 different puppies that we manage, I guess using that  
25 comment from Patricia's presentation.

1           So, they have different maintenance schedules,  
2 they have different pieces that break that you need to  
3 keep in stock. You know, these things need to be  
4 managed well for the corridor. And they're barriers.

5           Being safe means you need to have lighting,  
6 number one, so you're installing lighting, typically, on  
7 these stations. I think, you know, there are going to  
8 be spots you'll find where you'll be in a parking lot  
9 with adequate lighting and other retail. That's fine.  
10 But you've got to make sure that you've got some  
11 lighting measurement there.

12           What we do for all our Freedom Stations is we  
13 send out a security assessment from an independent third  
14 party and get a report on each of those stations. And  
15 it's not just about what's going on in this neighborhood  
16 or on this property, which is part of it. You know, how  
17 many police calls have happened at that site, and what  
18 type? And does this affect our drivers.

19           But also, the configuration of the station and  
20 are you creating unnecessary barriers, visual barriers,  
21 ambush opportunities. Those things are really critical.  
22 It means, also, 24-hour service for drivers.

23           So, because of the characteristics of corridor,  
24 these factors, I think, come into play more  
25 significantly than intra-urban sites.

1           And there certainly are some solutions, some  
2 technology solutions. Some partners on the panel have  
3 already implemented those. You definitely need to have  
4 somebody on the phone available, and you've got to have  
5 somebody ready to roll out to that station when it  
6 breaks, or when there's a driver there and it's broken.

7           Anne, from ChargePoint, mentioned putting level  
8 2 alongside the DC chargers. I think you definitely  
9 need to do that. For different reasons, the DC charger  
10 may not work and the L-2 will. That may be the charger,  
11 that may be the car.

12           We continue to introduce new cars into the  
13 market, as we all know and celebrate. And operating an  
14 existing network of chargers, we had found that those  
15 cars don't all work with all the chargers out there,  
16 sometimes. And so, you find yourself surprised a bit  
17 and so you have to have these redundancies built in.

18           We think, you know, at least a couple of DC  
19 chargers and a couple of L-2s is probably what you're  
20 going to need to do this work.

21           So, there's a few thoughts for you there.

22           MR. CLINT: Thank you.

23           So, question number five, what are some of the  
24 technology advancements, innovative developments and  
25 reliability issues?

1           Stephen, we're going to start with you here. I  
2 think some of the thing we were thinking about were the  
3 high-range vehicles that are going to be coming out,  
4 improved, increased charging capacities, solar power  
5 charging and location of energy storage.

6           MR. KELLEY: Yeah, it's a great list. And I  
7 think all of the things -- what I would add to that a  
8 little bit is some of the key challenges of getting EV  
9 charging and buyers over those concerns.

10           And so, I'm definitely seeing, you know,  
11 extended range, lower cost on the vehicle side. But if  
12 you focus just on the EV charging side, it follows a  
13 similar theme. We're seeing lower-priced charging units  
14 coming into the market. We're seeing a higher use of  
15 software and other services, like energy storage,  
16 renewable energy to mitigate some of the challenges that  
17 people have in getting these installed and functioning.

18           You're starting to see a replacement of some of  
19 the legacy equipment that was out there, mainly because  
20 of cost to keep repairing, lack of software, other  
21 challenges with that equipment.

22           But, you know, you're also seeing the power  
23 issue. You know, many facilities don't have the load  
24 available or the ability to add on a 50-kilowatt load to  
25 a breaker. And so, you're starting to see some creative



1 solutions in the 20, 25 kilowatt range, and ways to  
2 handle that power more efficiently, whether you put  
3 batteries in between and you pull a smaller load.

4           So, there's some really creative stuff that's  
5 happening to solve these problems. And you're also  
6 seeing partnerships of different people coming together  
7 to tackle the problem because we're all trying to figure  
8 out the same issue and it's how do we do it most  
9 efficiently.

10           So, that's kind of a quick overview of that.

11           MR. CLINT: Thank you, thank you for that.

12           Lloyd, do you want to add to that?

13           MR. TRAN: Yes, I'd like to add my perspective.

14 At the present time, we are currently siting and  
15 planning to install 10 DC fast chargers at hotels along  
16 the Freeway 5 and 99. And there's going to be a  
17 prospective, what they need, the customer, and we  
18 realized that DC fast charger is very important. It can  
19 serve as a catalyst for the widespread deployment of the  
20 electric vehicle where these real or perception needs is  
21 there.

22           Most of us, myself included, when we know that  
23 the electric vehicle can travel far distance without  
24 being limited to a certain township or regions, it gives  
25 us, as a new buyer, peace of mind that we can go very

1 far.

2           And also, many of EV drivers are very well  
3 technical savvy. They are highly early adopter and they  
4 know technologies can do for them.

5           The fact the DC fast charge not only charge the  
6 vehicle, but like Kelley mentioned, in the future the DC  
7 fast charge can play a very important role and help  
8 allow vehicle -- to building of vehicle to have  
9 communications.

10           So, I think the DC charge plays a very important  
11 role, even though it's technically challenge. I see  
12 there some interest in terms of supporting the vehicle  
13 to grid.

14           And if you look at the DC fast charge, not only  
15 it can help us, the driver, but it can help the building  
16 or the hosting sites.

17           My experience, worked with a number of hotels,  
18 the Marriott Hotel, Holiday Hotel, they very keen and  
19 very supportive of deployment of electric vehicle, even  
20 though there's some challenge in terms of the power  
21 supply whether there is enough electric capacity for  
22 them.

23           Luckily, most of the hotels we work with, they  
24 have plenty of power and they're really keen and embrace  
25 our proposal to install the vehicles. Right now is a

1 challenge, is not only we can do that, but we need more  
2 DC fast chargers. So, first, to fill the gap, as we  
3 identified earlier, from the Bay Area to Los Angeles, as  
4 you mentioned, more than 40,000 electric vehicles in the  
5 Bay Area and about the same or more in Southern  
6 California.

7           The gap in the San Joaquin, if we work together  
8 and fill those gaps, we can not only fulfill the desire  
9 and the dream of the West Coast Highway strategies, but  
10 it only facilitate not only for the travelers from north  
11 and south, but also local people. Even though in San  
12 Joaquin, the number of EVs is relatively small compared  
13 with the Bay Area, but a lot of people in the Central  
14 Valley contact us, asking when your EV station is ready,  
15 we would like to buy one or two. And not only we  
16 fulfill the gap that we saw earlier, but also we can  
17 help the local people to get started.

18           So, I think those are a very exciting time for  
19 us. I want to add one thing, that the DC fast charge is  
20 an electronic device and people perceive that. It  
21 should be small, compact, aesthetic looking. So, I  
22 reasoned that to help deploy the EV, we not to have the  
23 vehicle small, compact, use less power as possible, and  
24 be deployed everywhere. In the hotel, in the  
25 restaurant, in places.

1           And I think maybe five, ten years, well, we look  
2 at the equipment specification of DC fast charger should  
3 be much, much more advanced than what it is today, which  
4 is a pretty big, like refrigerator machine.

5           And when I told my hotel, you know, if we can  
6 put a big one in front of your hotel, they say, well, I  
7 would rather see a size about half of it.

8           So, that's the challenge to many OEM to produce  
9 something, you know, nice looking, a little bit low  
10 cost, and easier to install so we can help to deploy in  
11 as many places as possible.

12           MR. CLINT: Thank you.

13           Okay, probably the most pertinent question on  
14 the group is -- we're going to ask Bill Boyce to chime  
15 in.

16           How can the state best promote, and the state  
17 being in this case the Energy Commission, best promote  
18 filling the geographical gaps?

19           MR. BOYCE: This is always an interesting one to  
20 look at. And I think the state, actually, already has  
21 actually, classically started to do this, in some of the  
22 solicitations, obviously. Where they have geographical  
23 gaps, you can limit the solicitation to be only  
24 applicable to certain counties.

25           And I think some of the recent PONs have started

1 to do that in some of the areas.

2           But I think, you know, where a lot of gaps  
3 occur, I think classically the business cases are  
4 really, really tough. And, you know, that then drives  
5 the fact that the overall motivation to install a  
6 station, and north of Sacramento, and Charlie and others  
7 have just talked about, you know, there's nothing  
8 between here and the border. And so, you get to the  
9 point where those business cases are really tough.

10           And I think the Commission, and CPUC, and others  
11 really need to recognize that the financial formulas to  
12 get stations in there are also a lot different. You  
13 can -- you, and I think some of this stuff with the  
14 recent CPUC ruling, of getting more utility involvement  
15 in covering some of the infrastructure is some of the  
16 good things. And that's kind of in a -- I realize the  
17 state here is wider than just the Energy Commission, so  
18 I'm trying to get upon that. Is how do you get more  
19 motivation into that. So, I think really recognizing  
20 what a lot of the financial formulas are.

21           And one of the other things I think about, you  
22 know, and this is just throwing it out there, a lot of  
23 the solicitations are limited to, let's say, \$500,000.  
24 And when you're trying to install a network of charging  
25 between here and the border, that amount of money does

1 not go very far.

2           And also, the other thing I think are the  
3 timelines. Charlie said it, I know Terry said it, and  
4 I'll say it, you know, the property negotiations in  
5 siting take a long time. If you consider that it takes  
6 about a year or two to get one in the ground, you know,  
7 that doesn't fit very well with some of the grant  
8 solicitation timelines.

9           Also, there was kind of a requirement, I think,  
10 that was in the last solicitation that you really  
11 needed, almost, the property owner's signed letter that  
12 he was going to support it.

13           One of the things we found is, well, that's  
14 good, but that might only be in a real high-cost  
15 location and it doesn't necessarily provide a lot of  
16 flexibility with where we put these things. And you try  
17 to put them in the best site, but that can be just a  
18 huge cost driver and then you spend all of your money on  
19 one or two sites, which isn't the best.

20           I know at SMUD, we're going to be really trying  
21 to look at a different model, and this is one I would  
22 suggest, is we're going to really be trying to find new  
23 construction sites, where stuff isn't in the ground. I  
24 mean, this is a classic utility, or classic electrical.  
25 I mean, the cheapest way to put it in is before you even

1 start the design.

2           And, you know, those don't necessarily match up  
3 with this requirement that I have a signed letter from  
4 the property owner, because in a new design situation  
5 you might even be a year ahead of that type of  
6 situation.

7           So, you know, I think trying to find even some  
8 new solutions today. Those business models are really  
9 tough.

10           Two other, just mechanical things, you know,  
11 making sure that whoever goes for that agreement will  
12 maintain the site for, you know, a period of time.

13           And then one of the others we really did, and  
14 this is kind of hardware selection, we were a little  
15 hard-nosed when we went out for our bids for hardware.  
16 But we know in Sacramento that temperature conditions  
17 are really hot. And we looked around and some of the  
18 hardware's only good to 104 degrees.

19           And, you know, this gets into that fact of, you  
20 know, when a person does show up in Redding, on a 118-  
21 degree day, that the stuff will work.

22           And so, you know, the reliability of the  
23 equipment, making sure it's spec'd right, or redundancy,  
24 or how are you going to fill those become really  
25 important for establishing that range confidence.

1           So, I just threw a gamut of stuff out there. I  
2 don't think we have all the answers. I think we're  
3 still going to invent things.

4           Being totally locked in on a site has its pros  
5 and cons. Sometimes it's good because you've got more  
6 surety that I can get it in, but the con is it can  
7 really drive cost.

8           MR. CLINT: David, what is the wiliness of  
9 potential partners to share in deployment?

10          MR. PETERSON: So, the short answer is it  
11 varies. I'd love to say it's all high all the time, but  
12 it certainly varies.

13          I think before I get started, I'd like to maybe  
14 give you a little bit of background about why Nissan's  
15 here, right. Why, we're the only -- well, we're not a  
16 utility, we're not an EVSP, and we're not a research  
17 institution, so why is a car maker up here?

18          So, we've made direct investments. And we  
19 actually don't own or operate anything, except at our  
20 headquarters. Our dealers have DC fast chargers and we  
21 help put together deal structures to get projects done.  
22 So, partnership is really what we do. This is our  
23 space.

24          And generally, you know, what do we have to play  
25 with? Well, capital expenditures, operating expenses



1 and revenue. And we try to get really creative about  
2 how we piece all this together and apportion risk. And  
3 we've been doing this all over the country, so we've got  
4 a lot to share.

5 But I'm going to limit the types of partners  
6 that we focus on, at least for this discussion, to site  
7 hosts, EVSPs, utilities, public agencies, and auto OEMs.

8 So, probably the most important partner in all  
9 of this is the site host, at least in the deals we have  
10 worked on. And you have to have someone who's  
11 absolutely willing to host the project. They have to  
12 have conceptual buy-in. I think that's first and  
13 foremost. That's the start of any partnership, really.  
14 And they have to understand what it means, what DC fast  
15 charging means for their business.

16 And so you have to have, at a basic level,  
17 alignment with how the business operates. And one rule  
18 of thumb that I use is I look for businesses that have  
19 under-utilized parking spaces.

20 And I think Lloyd actually brought up one that I  
21 have looked at very closely, which is hotels. Hotels  
22 have a business model that aligns nicely. It's 24 hours  
23 a day. They have plenty of parking, typically.  
24 Especially if we're thinking about corridor charging  
25 here. But the parking spaces are usually empty. Rarely

1 are the a hundred percent full. So, I'd call that a  
2 great opportunity for a partner site host.

3 And you also mentioned the power availability,  
4 which is another critical part of it.

5 EVSPs, so EV service providers, these could  
6 those that only have networks or partner with those that  
7 -- if they only have a network, say like ChargePoint.  
8 And I don't want to speak for ChargePoint because I  
9 don't know if ChargePoint's owning and operating an  
10 infrastructure.

11 But if we look historically at the level 2  
12 deployments, ChargePoint doesn't, but partners. So,  
13 this would include that type of company as well as, say,  
14 NRG, that also owns and operates infrastructure, as well  
15 as a network.

16 So EVSPs are motivated to do this, generally  
17 speaking. And investing in corridor charging increases  
18 the value of the network to an urban consumer, to an  
19 urban resident, whether it's a perceived or a real need.  
20 I know it's real for some because I get e-mails by  
21 drivers that want to drive up to San Francisco and are  
22 really pissed off they can't do it on a single charge.

23 So, whether perceived or real, there's that  
24 possibility and you eliminate that from the purchasing  
25 decision, as well as from the driving experience. They

1 can at least do it, if they want to.

2 But secondly, I think we need to think about the  
3 corridor communities, and I think Lloyd also mentioned  
4 this, and serving those communities. And that's also of  
5 interest to an EVSP. However, I think there's  
6 competition for resources and a lot of the resources are  
7 being allocated to where the drivers are today, and  
8 that's in urban areas.

9 To, this is where there's potentially a role for  
10 public agencies to create incentive to invest in areas  
11 where they're not seeing the private sector invest. And  
12 we usually call that market failure, but I think Adam  
13 Langton did a nice job summarizing what that was and how  
14 my next partner could be involved.

15 But before I get to utilities, I think we see a  
16 high willingness to invest among public agencies, but we  
17 haven't seen a lot of traction -- I'm talking across-  
18 the-board public agencies, from local, regional, to  
19 state level. We haven't seen great traction.

20 And I'll highlight one example. With the Bay  
21 Area, and Karen will remember this, if she's still here.  
22 With the Bay Area Air Quality Management District,  
23 Nissan partnered with it to donate a DC fast charger and  
24 provide funding on top of it to leverage the Bay Area  
25 AQMD's incentive program, which I don't recall if it was

1 the exact amount.

2 But, basically, it could result in really a  
3 minimal capital outlay at the outside of the project,  
4 we're talking maybe \$5,000. But there were hardly any  
5 respondents to this. There were hardly any proposals  
6 that came in for this.

7 And I think this has a lot to do with the  
8 restrictions around that funding and the flexibility for  
9 a private entity to implement whatever it thinks it  
10 needs to do to maximize ROI. So, I think that is one of  
11 the challenges around public funding.

12 I won't dwell on utilities, but I will say that  
13 there is a role, a big role here, and that is in  
14 bringing three-phase power to sites in low-population  
15 density areas.

16 A utility friend told me it can cost anywhere  
17 from \$15,000 to \$25,000 per mile to bring three-phase  
18 power to a remote location. And that -- in addition to  
19 that, helping, assisting with offsetting the cost of  
20 transformers can also be critical.

21 But lastly, auto OEMs. And recently, the  
22 announcements of BMW and Volkswagen are fantastic, it's  
23 great to see them joining the party of investing,  
24 directly investing in charging infrastructure.

25 And you're probably wondering why we're not all

1 doing this together. Why haven't all the OEMs just come  
2 together, created a fund and just said, hey, let's get  
3 this done and the average cost for all of us is going to  
4 be really low.

5           So, high willingness, I'd say, at least in  
6 theory, right. But where we differ sometimes is around  
7 the expectation of how that money is spent, how much  
8 funding is available. Certainly, budget cycles can be  
9 challenging. Competitive challenges, and that could be  
10 really about internal or external perceptions.

11           And this will be a little bit more sense, maybe,  
12 when I talk about the next one, which is something I  
13 call, which is path dependence. This is really prior  
14 agreements that limit the scope for future collaborative  
15 activities, and investment priorities.

16           So, I think between these two you can see a lot  
17 of challenges, so urban versus rural, in some cases.  
18 Now, this is being eliminated, thankfully, this combo  
19 versus CHAdeMO. But that was still -- that was, I  
20 think, something that affected a lot of the investing  
21 decisions and the willingness for OEMs to come forward  
22 and collaborate. That still may be affecting some of  
23 the decisions for other OEMs, but hopefully not.

24           Level 2 focus versus a DC fast charger focus.  
25 High quality locations versus an anything goes approach.

1           So, a lot of different challenges, I think, for  
2 OEMS to come together. But we're trying very hard to  
3 get everyone to come to the table and invest in some  
4 way, whether it's -- it's okay if it's piecemeal today  
5 but, ideally, we're all coming together and figuring out  
6 some way of doing this that meets the objectives and  
7 needs of our respective organizations.

8           So, I'll end there, thank you.

9           MR. CLINT: Thank you.

10          So, Leslie, I think in the interest of time we  
11 better move directly to the public comment.

12          MS. BAROODY: I'm afraid so. I mean, we could  
13 go all day on this topic, I'm sure.

14          MR. CLINT: Yes.

15          MS. BAROODY: So, is there somebody on the  
16 WebEx? If you don't mind, we'll take a couple minutes  
17 here for one person here that's very eager to speak.

18          MR. CLINT: Okay, so we have a comment coming in  
19 from Tony Williams, who's from Quick Charge Power. He  
20 has some comments related to his travels from Baja,  
21 California to British Columbia, on the West Coast  
22 Electric Highway.

23          So, Tony, I'm now unmuting your phone and you're  
24 now free to speak.

25          MR. WILLIAMS: Hi, my name's Tony Williams. Our

1 company is Quick Charge Power, we produce electric  
2 vehicle charging equipment for cars.

3 I was the first person to drive on the West  
4 Coast Electric Highway which, unfortunately, did not  
5 include very many parts of California in 2012. And,  
6 subsequently, we did the so-called Baja California to  
7 British Columbia, BC-to-BC 2013, as a rally with a bunch  
8 of other cars.

9 California's always been a difficult part in  
10 this entire infrastructure, as far as corridors are  
11 considered, when we include the entire state.

12 I heard a lot of talking about folks, about  
13 metro areas and the like that it's easy to justify that  
14 there's only cars in the Bay Area, or Sacramento, or Los  
15 Angeles, or San Diego so, therefore, that's where all  
16 the charging should go.

17 And we just completely discount the fact that  
18 somebody actually might want to drive from Los Angeles  
19 to San Francisco, or from Los Angeles to Las Vegas. And  
20 they don't particularly consider the fact that maybe  
21 their car only goes 80 miles that that's not that big of  
22 a deal to them. It might seem like a big deal to the  
23 people putting in the infrastructure.

24 But in the future, as we know, and has been  
25 stated several times, we will have cars that go 100

1 miles, 200 miles, 300 miles and the like. And, of  
2 course, we don't even talk much about Tesla with that  
3 stuff.

4 A little more background on me. I actually am  
5 part owner of the very first ChargePoint DC charger,  
6 that's the Fuji charger that we put in San Juan  
7 Capistrano. It was so well suited that I think we're  
8 over 4,000 paid charge events on that, now. And there  
9 are now two more charges that were provided by David  
10 Peterson, and the Nissan Corporation, that we installed  
11 in Irvine.

12 So, I have a really strong background in what  
13 makes electric cars go. I personally drive only  
14 electric cars. I don't have a gasoline equivalent and  
15 my house is solar powered.

16 So, getting to the corridor issue, my points I  
17 want to make very quickly because I know we're very  
18 short on time, is that there is a lack of a business  
19 case. That was stated and it's absolutely imperative  
20 that the state fund those corridor travels.

21 A corridor would mean in our state, in  
22 California, Los Angeles to Las Vegas, San Diego to  
23 Phoenix, Sacramento to Ashland, Oregon, which begins the  
24 West Coast Electric Highway. And, of course, the 101  
25 corridor is much better suited for that. And then, San



1 Francisco, Sacramento to Lake Tahoe and Reno.

2 Those are major corridors that our state has,  
3 that millions of people travel. Not just electric car  
4 people, but any car. And they might not be flying in a  
5 Boeing 737 to go to Lake Tahoe, so they prefer to drive  
6 their car, or take their family, or go on a ski trip,  
7 whatever it is.

8 So again, there's a complete lack of a business  
9 case because, as was stated, not very many people are  
10 going to want to do that, which doesn't make it a very  
11 smart business proposition for many organizations.

12 Secondly, those power stations or these charge  
13 stations need to be very high-powered. Not just an  
14 afterthought, oh, since nobody's going to be using it  
15 they should be really low-powered, or they should be  
16 junk that we just had leftover.

17 Instead it should be the opposite that Tesla,  
18 another California company, is doing quite well. They  
19 should be at the plaza that the folks want to go to.

20 And an affiliate company that I'm associated  
21 with received a California Energy Commission grant for  
22 \$500,000 to build such a plaza. And when it was  
23 mentioned how \$500,000 doesn't go very far, I can tell  
24 you it doesn't go very far. And we've been doing this,  
25 now, for quite some time.

1           So, as we're considering this, where there's no  
2 business case and the state should be funding it,  
3 \$500,000 isn't even getting your foot in the door in  
4 terms of what would be required at these stations, that  
5 must be high-powered, to power these cars that will be  
6 100-, 200-, 300-mile range.

7           And as we already know, both the current public  
8 charge protocols that are used by Nissan, the CHAdEMO  
9 version, and then by the German and GM, General Motors  
10 companies that use the SAE combo, those are both already  
11 designed to be 200 amp capable. And that means that  
12 they can up -- they can use up to 100 kilowatts of  
13 power, and that's only if there's one charger.

14           So again, we get to not only the lack of a  
15 business case for how many cars may use it, but there's  
16 a -- it has a very high demand to have the highest power  
17 charge stations out there.

18           So, in order to offset that, my recommendation  
19 is that any public funds that are spent on this kind of  
20 corridor travel infrastructure should have a robust, a  
21 very robust battery storage system.

22           And that offsets a couple things. One thing is  
23 the batteries could be large enough to power straight DC  
24 into all the cars. And secondly, we don't need the  
25 giant three-phase power that David Peterson was talking

1 about, just shortly ago. That we can now power that, it  
2 may be 20 kilowatts and under where it's continuously  
3 charging at this low power rate, that can be on mono-  
4 phase, and a very large battery so that the battery  
5 would be able to handle maybe dozens of charge events.  
6 And it would have a very high dependability because even  
7 if the power infrastructure was dead, cars could still  
8 be charged at these stations because they're DC powered  
9 and not AC powered.

10           And the last part that I want to get to on the  
11 infrastructure and corridors is that it was mentioned a  
12 couple of times about confidence. People need to have  
13 that confidence and they're not going to go to a station  
14 that's at this way point, in let's say Baker, going to  
15 Las Vegas, or in Orland, going up to Ashland, Oregon,  
16 from Sacramento, or some of these smaller towns.

17           It needs to be that plaza that people have  
18 confidence to go, that they know that if they show up  
19 there's not just going to be a single charge station,  
20 but there will be multiple charge stations, and all  
21 these charge stations will have high-power capability.

22           So, that will offset demand fee issues and it  
23 will make it so folks, like myself, who drive electric  
24 cars, don't have to consider, well, gee, maybe I need to  
25 rent a gasoline car, or own a second gasoline car. Or

1 maybe I'm in an apartment and I don't even have access  
2 to have a gasoline car or even charging at my apartment.  
3 Or maybe I don't even have a job, I'm retired, or a  
4 student, and there's no place for me to charge at work.  
5 And these infrastructure things, I still want to drive  
6 to Las Vegas and I still want to do it in a car that's  
7 available to me, and that might be electric.

8           And that's how we promote that, and that's how  
9 we fund it, and that's how we mitigate some of these  
10 situations that have been discussed already.

11           And I cede my time to the next person.

12           MS. BAROODY: Thank you, Tony, really appreciate  
13 your comments.

14           Well, we are at -- past the end of our time. I  
15 want to thank this panel so much. You've done a great  
16 job.

17           And thank you, John, for leading this panel.  
18 Let's give everybody a hand.

19           (Applause)

20           MS. BAROODY: Just as a reminder, we will have  
21 public comment at the end of the session, at 3:45. So,  
22 if you had questions or comments you wanted to make  
23 then, please do and bring your blue card up here.

24           So, we're going to reconvene at, I hate to say  
25 it, 1:15, just to be able to fit everything in. So, I

1 hope you find places to eat nearby. Thank you.

2 (Off the record at 12:30 p.m.)

3 (On the record at 1:20 p.m.)

4 MS. BAROODY: If everyone could get a seat now,  
5 we're ready to start our afternoon session. Once again,  
6 we're running a little bit late and we're starting this  
7 session, it must be about 1:20 right now.

8 This is a session on EV charging infrastructure  
9 in multi-unit dwellings.

10 If I could have everyone's attention?

11 So, we have a facilitator here today. We have  
12 two, actually. Joel Pointon, he is the Electric  
13 Transportation Program Manager with SDG&E. Joel has  
14 been involved with SDG&E's preparation for the region's  
15 introduction of plug-in electric vehicles since he began  
16 the Clean Transportation Program in 2006.

17 He's done quite a bit of work with automakers,  
18 charging vendors, government, other stakeholders and has  
19 assisted in the development of regulations, standards  
20 and guidelines for PEVs.

21 And he serves on a number of boards and advisory  
22 groups. He's also chairing the working group in the  
23 Plug-In Electric Vehicle Collaborative's working groups  
24 on Multi-Unit Dwellings and Workplace.

25 So, take it away, Joel.

1           MR. POINTON: All right, thank you. I'm really  
2 pleased that we have such a distinguished panel this  
3 afternoon to talk about what I perceive to be one of the  
4 largest challenges to the adoption of plug-in electric  
5 vehicles, which is multi-unit dwellings.

6           In San Diego, alone, we have 55 percent of our  
7 population that live in multi-unit dwellings and,  
8 therefore, do not have the opportunity to choose this  
9 form of transportation for their living style.

10           As a co-chair for PEVC workgroup for Multi-Unit  
11 Dwelling and Workplace, Karen who spoke earlier this  
12 morning, Jasna was one of our past chairs, as was Bill  
13 Boyce. I just want to tell you, to quote Abby Hoffman,  
14 "Steal this book".

15           So, those guides you can download from the PEV  
16 Collaborative. They will give the people that you're  
17 working with the vocabulary, the overview of the  
18 technologies, the overview of the vehicles. It's a  
19 great tool to send as a link to someone, to get them  
20 prepared for a discussion on multi-unit dwellings or  
21 workplace charging.

22           And I do want to mention that there is an RFP  
23 out for the PEVC working group to continue the outreach  
24 work that we're doing based on these publications that  
25 are available. And you can see the PEV Collaborative

1 website, where you can get additional information.

2 I'm not doing something right here -- yeah, if  
3 you would, because we only have four slides.

4 So, let me get right into it. I don't know  
5 where Leslie got that long introduction, but Electric  
6 Transportation Manager would have sufficed.

7 I wanted to introduce our panel members. Mary  
8 Nitschke, to my left, is Director of Ancillary Services  
9 at Prometheus Real Estate Group, one of the largest  
10 privately held real estate companies in the Bay Area.  
11 They currently have 21 level 1 stations installed at ten  
12 communities, and one community with 203 level 2 or level  
13 1?

14 MS. NITSCHKE: Switch that, so we have 21 level  
15 twos and --

16 MR. POINTON: Okay, 21 level 2s. I was  
17 wondering about that, when I saw that. And 203 level 1  
18 charging stations installed.

19 Mary also participates on a Multi-Family  
20 Workgroup for EV charging in Multi-Unit Dwellings.

21 John Kalb founded EV Charging Pros, in 2011, to  
22 provide vendor independent advice and strategic  
23 consulting to commercial property owners, workforces,  
24 and multi-family organizations. John is on the board of  
25 City Car Share and Charge Across Town.

1           And Richard Schorske is Founder and Executive  
2 Director of EV Communities Alliance, a public/private  
3 collaborative focused on EV market acceleration, which  
4 currently coordinates several CEC-funded infrastructure  
5 and EV planning projects in Northern and Central  
6 California.

7           EV Alliance also assisted with PEV Readiness  
8 Plans for Central Coast and Monterey, and has conducted  
9 market study on MUDs and EV charging in the Bay Area.

10           So, that's our panel. Our format will be to  
11 take a series of questions, which you can see on the  
12 board here. We'll present them to our panel members.  
13 They will speak to the question.

14           We'll try to move through all five of the  
15 questions. We may have to opt for just four.

16           At that point, we will switch to the Workplace  
17 Charging Group. We have reserved and we will keep the  
18 last 15 minutes for audience questions. This is not  
19 about talking heads today. We really would like to  
20 entertain your questions about what you've heard on the  
21 panel and any clarification questions that you may have.

22           So, let's start out. The diversity of these --  
23 I'm sorry, the challenges for the communities, as Leslie  
24 had touched on this morning, the diversity of the  
25 communities. We have size, we have spectrum, rental



1 versus ownership, existing parking formats.

2 The physical layouts, existing electrical  
3 infrastructure, the age, the layouts, existing community  
4 legalities and traditions, respecting and adhering or  
5 changing these.

6 Cost, what is practical, how to cover these  
7 costs initially, and how to pay for the ongoing costs,  
8 and the operating, and maintenance, and management of  
9 the program, the mechanics for the life of the program  
10 and the future phases.

11 So, on to our questions. So our first question,  
12 given your experience with the MUD vehicle charging  
13 arena, what phase do you see us as being in presently  
14 and what, in your opinion, needs to happen next to allow  
15 this segment of charging to grow?

16 And Mary, I'll go to you, first.

17 MS. NITSCHKE: Well, in the multi-family arena,  
18 so apartment communities, I think we're right in the  
19 beginning. There hasn't been that much demand from  
20 residences for charging stations within multi-family  
21 communities, and so owners and operators haven't really  
22 considered adding the infrastructure.

23 MR. KALB: I think we're in the pits. Mean, you  
24 know, we haven't even gotten to the starting line, yet.  
25 One of the projects I'm involved with is doing a survey

1 for the California Apartment Association, Tri-County  
2 Chapter. We put out 3,000 surveys about the state of  
3 the EV charging. We got 23 responses back.

4 Of those 23 responses, I was able to  
5 individually interview seven individuals who said they  
6 were interested in having further conversations about  
7 the topic. So, we're definitely at the very beginning.

8 What do I think needs to happen? A lot of  
9 things, but the main thing is that there's a high level  
10 of information chaos out there. And every time I speak  
11 with people, they have a very hard understanding,  
12 really, what are the issues for their organization and  
13 working through the long list of not only siting, but  
14 business issues.

15 One of the first things I'd like to see happen  
16 is some kind of workforce that was funded to help multi-  
17 family organizations address the issues. This is about  
18 planning, long-term planning, long-term decisions, a lot  
19 of discussion needs to be done internally. And it's all  
20 not only site-specific, but ownership-specific.

21 And what's interesting is in the multi-family,  
22 you might have one property manager, who manages 30  
23 properties, but they have 20 different owners. So, that  
24 means it can't just be one conversation, it has to be  
25 one times 20.

1           So the problem is, as was brought up earlier  
2 this morning, there's a very long amount of time to go  
3 from thinking about this to actually deploying it. The  
4 9 months to a year is actually a real number.

5           And what we need to get kick-started is some  
6 kind of way to help multi-families really plan for what  
7 they want to do.

8           MR. POINTON: Richard?

9           MR. SCHORSKE: Yeah, I concur strongly with both  
10 Mary and John. I think that if you look at sort of the  
11 pipeline of this, you're looking at three phases.

12           You're looking at the education phase, and the  
13 site qualification phase which is several months, in  
14 most cases, for larger property owners.

15           Then you're looking at the infrastructure and  
16 the utility interconnect preparation phase, which is  
17 often many more months, particularly if the utility is  
18 slow-walking the interconnect.

19           And then you're looking at the actual  
20 construction, which is the shortest phase.

21           And each of these I think should be funded  
22 separately or at least that should be considered.  
23 Because if you look at the current sales cycle it's,  
24 frankly, not that profitable for most of the vendors to  
25 go in there and do that education and that outreach.

1 It's just too darn long. It's too costly in time. And  
2 you're selling a \$5,000 box, there's no margin in that  
3 for months and months of education, if it's just a small  
4 deployment.

5           So, I think that on the other hand, you know, if  
6 you look at it structurally, you're looking at getting a  
7 lot of bang for the buck in terms of getting  
8 infrastructure into a very large property ownership  
9 group, where you can theoretically begin to serve, you  
10 know, 500 tenants or something like that in one  
11 building, with the beginning deployment of just a few  
12 chargers.

13           So, I think that there's reason for the state to  
14 not necessarily look at the usual metrics of, say,  
15 \$5,000 subsidy per EVSE and actually look at the whole  
16 project, look at the 15-year time frame, take into  
17 account the numbers that we heard from South Coast, for  
18 example, that we're going to have 100-percent PEVs by  
19 2040. You know, we may not get quite to that level, but  
20 I'm sure it will be 30 to 50 percent, at least.

21           And consider how cost-efficiently, most cost-  
22 efficiently you can do the upgrades, the basic  
23 electrical capacity upgrades, which can be very costly,  
24 but get those done first instead of just cherry-picking  
25 two or three sites, which then mean that you're at your

1 limit.

2           So, I would strongly endorse getting more money  
3 up front into the largest sites and also budging for,  
4 perhaps, even a vendor-neutral or independent kind of  
5 workforce that can go out there and do that educational  
6 piece as a separate element.

7           MR. POINTON: So, having done workshops for  
8 multi-unit dwelling communities within our region for  
9 the last four-plus years, working through PEVC, for  
10 developing the guides, the educational tools that we saw  
11 as necessary, developing a survey that property managers  
12 can use a sense of what's coming up, the phase that I  
13 see -- the orientation phase has begun, we're well into  
14 it. People are aware that plug-in electric vehicles are  
15 arriving. They're somewhere on their horizon. They're  
16 not on their priority list, they're somewhere on their  
17 horizon.

18           I see one of the challenges as how do we get  
19 properties and, Mary, I guess I'll direct this to you  
20 because you're one of the decision makers. How do we  
21 get properties to acknowledge this as an amenity,  
22 something that they want to really provide to attract  
23 the demographic?

24           If you look at the demographic of who's buying  
25 these vehicles, it's a very desirable group of

1 individuals. Not that that won't change over time.

2 But I'm a little surprised and I'm challenged by  
3 how do we get that amenity concept as part of the  
4 advertising for a property?

5 MS. NITSCHKE: Well, it really, from my  
6 management's perspective, it's sort of a limited  
7 amenity. Because it's not like adding Wi-Fi to a  
8 building, or having a pool where it's something that  
9 everybody can participate in. It's restricted to a  
10 very, frankly, low percentage of the demographic of the  
11 property.

12 Additionally, it's an expensive amenity. So,  
13 you look at the CAPEX dollars available to the asset and  
14 you kind of consider is this something that's going to  
15 drive rents.

16 Most of my assets are concentrated in the Bay  
17 Area, where we have a very stable occupancy and we  
18 haven't lost any leases because we haven't had EV  
19 charging at some of our communities.

20 So, when it comes time to look at it, we go,  
21 this is an amenity that's really not going to provide us  
22 with any opportunities. We're better to take this money  
23 and add washers and dryers into the units, or air  
24 conditioning, or Wi-Fi in our public areas, or package  
25 lockers. Those are the amenities that everybody can use

1 and will actually help drive revenue for the site.

2 MR. POINTON: So, getting, working our way into  
3 our next question, given the resources to get to a next  
4 step where would you devote, target those resources and  
5 how would it accomplish and support the promotion of MUD  
6 vehicle charging within the communities?

7 MS. NITSCHKE: So, are you asking like how you  
8 would structure an opportunity, a rebate program?

9 MR. POINTON: What would it look like? Would it  
10 be a rebate program, would it be subsidized purchase of  
11 equipment, or coordination, additional support services  
12 for projects in designing and installing? What would be  
13 most useful from your point of view?

14 MS. NITSCHKE: It would probably be what we'll  
15 call a really flexible rebate program because it can  
16 take -- sometimes the permitting process for an  
17 installation can take an extraordinary amount of time.  
18 So, by the time you start the project and you would put  
19 your application in to the time you finish, it really  
20 can be nine months. And so, a lot of projects, when  
21 they look at a rebate program they're like, nope, we're  
22 not even going to try it because this is set up for us  
23 to fail, so we're not going to count on those funds.

24 So, it needs to be flexible and it needs to  
25 be -- each site, like we've talked about the challenges,

1 each site is like its own little being and they're all  
2 going to metabolize utilities differently. And so it  
3 needs to be a flexible program so that you can take into  
4 consideration the attributes of the site. What kind of  
5 capacity you have, what kind of parking you have  
6 available to you.

7           If it's one of those broad programs where it's  
8 you have to do 10 percent, nobody's going to touch it  
9 because you may have a very low parking ratio at that  
10 property and that would mean that since, again, you have  
11 a very low percentage of our demographic that's  
12 interested in charge stations, or that has an electric  
13 vehicle, you have a very -- you would be wasting your  
14 parking on spots that would be reserved for an EV, but  
15 you wouldn't have that many EV drivers.

16           So, you need something that's flexible and  
17 scalable in multi-family, so that as that need arises  
18 you can add to your infrastructure.

19           MR. POINTON: John?

20           MR. KALB: I think it really, beyond helping the  
21 multi-family organizations plan, I really think it comes  
22 down to electrical capacity is the critical issue.

23           I would de-link electrical capacity from  
24 parking, or make-ready's, or deployment of charging  
25 stations. I've looked at 500 buildings, if I've looked



1 at five, and I can guarantee you that only five percent  
2 of them have breaker space for two charges. All of the  
3 rest of them have no capacity to scale.

4 So, if we're looking at a long-term ability to  
5 serve a larger, more robust drive population, you're not  
6 going to do that with two chargers. So, you need 10 and  
7 you probably need 20. Maybe by the time we're talking in  
8 the future, we're talking 40 or 50, and the electrical  
9 capacity is not there at all.

10 So, could we develop a program where a multi-  
11 family, an apartment complex, a condo could say we want  
12 to invest in increasing our charging capacity or the  
13 electrical capacity that we will reserve for charging.  
14 We will agree to scale it to XYZ or present, and that's  
15 what you're paying for. I think that's a way of going  
16 about solving that problem.

17 MR. SCHORSKE: I really like both of those  
18 ideas, I think they're terrific. The only other thing I  
19 would add is coordinated marketing of the vehicles,  
20 themselves.

21 So, we have a number of entities that are doing  
22 a build-it, and they will come approach, and others  
23 not. I think we need to have the ability for OEMs and  
24 other intermediaries, like Plug-In America, and folks  
25 that have been doing ride-and-drive events, and so

1 forth, to come in and actually work with the property  
2 owner to proactively market the vehicles, and that  
3 includes car share entities, as well.

4           So, many car share entities are already working  
5 the MUD market, but they face a lot of the same  
6 obstacles as everybody else. And I think a coordinated  
7 approach that's more marketing-driven, that looks to  
8 actually match tenants with vehicles, with a car share,  
9 or privately owned is a great approach that we haven't  
10 seen, yet.

11           So, that would be the larger organizations would  
12 be particularly well situated to pursue that.

13           MR. POINTON: Richard, in that scenario what is  
14 the sequence of events there? Do you install the  
15 chargers first and then do the outreach to build the  
16 demand, or is it simultaneous or --

17           MR. SCHORSKE: Yeah, I think as close to  
18 simultaneous as possible is great. I mean, there's a  
19 lot of experience now with workplace ride-and-drive  
20 events that are coincident with the beginning of  
21 workplace charging, or an initial phase of workplace  
22 charging deployment.

23           And in the Bay Area, the Metropolitan  
24 Transportation Commission funded a million dollar  
25 campaign, called Experience Electric, where we went

1 around with partners and proceeded to do I think  
2 something like 5,000 ride-and-drives. And we have some  
3 beginning click-through to sales stats that are very  
4 impressive.

5 And you see, you know, the vehicle population  
6 rise in proportion to the EVSE population at these large  
7 employer sites. So, I think it's at both ends. Seeing  
8 the readiness is crucial, but concurrently have the  
9 vehicle -- marketing the vehicle presence is optimum.

10 MR. POINTON: Okay. So, you have a property  
11 with 100 units, Leslie is ready to write you a check to  
12 help you with your project for introducing vehicle  
13 charging in that project. If you have something of, say  
14 100 units, what size resource would you need to  
15 incentivize this project and where would those dollars  
16 go?

17 MR. SCHORSKE: Well, you're really putting me on  
18 the spot with a budget number. I'd probably defer to  
19 Mary.

20 MR. POINTON: I'm ball-parking, we're looking at  
21 ball parks.

22 MR. SCHORSKE: Well, I mean I think 100 units,  
23 I'm actually going to invite an audience participant to  
24 generate a number on that. Stacey Reineccius, of Power  
25 Tree, is doing a lot of units in San Francisco.

1           What's a 100-unit building for an electrical  
2 capacity upgrade?

3           MR. POINTON: And what number of charging units  
4 would you put in there?

5           MR. REINECCIUS: (Off mic) Can you hear me all  
6 right?

7           MR. POINTON: Yeah.

8           MR. REINECCIUS: Okay. San Francisco's a little  
9 bit of an odd duck because it's got such a high  
10 percentage of electric vehicle sales, you know, or plug-  
11 ins, ranging to around 9, 9 and a half percent,  
12 depending on who's numbers you believe.

13           We, as a bit of background for those of you who  
14 don't know us, we are currently in construction in 100  
15 buildings in San Francisco, serving about 5,500 total  
16 tenants directly in the buildings.

17           So, what we've seen on the electric cost side is  
18 about \$1.30 a watt for the electric upgrade from the  
19 utility, which we think is far too high.

20           We would budget for a flexible approach, where  
21 you go in with a capacity that you think will serve, you  
22 know, around 10 percent or 15 percent of the total  
23 units.

24           MR. POINTON: So, you'd put ten units in for a  
25 100-unit building?

1           MR. REINECCIUS: No, you would put in enough  
2 electric capacity --

3           MR. POINTON: Okay.

4           MR. REINECCIUS: -- to serve that number, but we  
5 won't put in the rest of the gear until we see demand.

6           MR. POINTON: Okay.

7           MR. REINECCIUS: But we have an exclusivity  
8 agreement with the property so that we can safely make  
9 that investment.

10          MR. POINTON: So, if it's ten percent today, and  
11 like our panel members were talking about, and it  
12 becomes 20 percent, you know, down the road and 30  
13 percent in the future, do we over-size that initial  
14 infrastructure installation for the support because it's  
15 cheaper to do it all up front?

16          MR. REINECCIUS: Well, there are two different  
17 pieces to the infrastructure. There's the piece that  
18 goes into the utility and then there's the piece that  
19 goes to the car.

20          MR. POINTON: Correct.

21          MR. REINECCIUS: And in between that you put  
22 energy storage. And to make that work what we do is all  
23 of our EVSEs are configured to deliver up to 20  
24 kilowatts, basically the maximum level 2 charge rate on  
25 AC. We don't do any DC chargers. And we don't do any

1 DC chargers because they're all a fraction of the market  
2 and it's not a good investment.

3 MR. POINTON: Correct.

4 MR. REINECCIUS: Then we use the energy storage  
5 to provide the surge power necessary, when a car that's  
6 capable of that rate of charge comes in and visits.

7 MR. POINTON: Okay.

8 MR. REINECCIUS: And so that's how we would  
9 manage that. And we would manage that, as well, with  
10 additional stalls as they come in. We can expand the  
11 energy storage and trickle-charge the battery as we need  
12 to, keeping the --

13 MR. POINTON: Okay, that's your particular model  
14 and I know there will be variations. We're just trying  
15 to get a sense of --

16 John, do you want to speak to a different  
17 approach?

18 MR. KALB: Yeah, I want to just jump in here  
19 because I see the 13-606 maximum award amounts, I think  
20 for MUDs are rather small. \$100,000 for rental MUDs,  
21 with \$10,000 for application, up to \$50,000, you run  
22 those numbers and that's either ten projects or, what,  
23 two projects?

24 And with the HOAs, it looks like \$900,000 on the  
25 table, with between \$50,000 and \$300,000. Again, you

1 run those numbers and you're looking at 18 or 3  
2 projects. And so, these aren't really very scalable  
3 amounts of money in terms of the problem that we're  
4 looking at doing.

5 I don't believe that we can put together a  
6 "pilot project" that fits these budget numbers, that  
7 will satisfy us all, as the community, that we have a  
8 solution for 80 percent of the buildings that have that  
9 pilot and then we can then just add more money and scale  
10 it.

11 We really need to look at, as Mary says, more  
12 flexible, individual ways of looking at buildings and  
13 ownership groups.

14 The ownership groups are probably my biggest  
15 learning in the last couple of years is this has very  
16 little, at the moment of decision, to do about parking,  
17 metering, monitoring, revenue, energy. It has very  
18 little to do with that.

19 It has a lot to do with the net operating income  
20 equations of commercial property owners. It has a lot  
21 to do with the asset value of the properties. It has to  
22 do with how long these ownerships are going to hold  
23 those properties.

24 If you are an owner and you're thinking about  
25 flipping your building in three years, you're not going

1 to get involved in this project at all. You're going to  
2 push the decision to somebody else to when they have to,  
3 especially if they're not seeing any demand.

4 So, I'm advocating for really flexible money  
5 that can be applied as ownership groups need it, once  
6 they see demands, starting with actual power  
7 infrastructure.

8 I think that's the only way we're going to scale  
9 to actually solve the multi-family problem in the next  
10 six to ten years.

11 MS. NITSCHKE: And if I can just add a little  
12 bit to the infrastructure, just with an anecdote. So,  
13 our project that has 203 level 1, when we started  
14 construction on that we thought we were doing a really  
15 good job. We thought we had every single apartment was  
16 wired for level 1, and we thought that that was  
17 phenomenal. And right out -- this property was in  
18 Mountain View, and right out of the gate we had nine  
19 Tesla drivers run into the property and immediately say,  
20 congratulations, you installed an eight-track player.

21 So, it's hard to, even for us, right out of the  
22 gate go this is what the infrastructure that we need is,  
23 even if we go level 2 because what we start -- what we  
24 install at the beginning of construction might not be  
25 where the market is going or what kind of capacity we



1 need once we get there. And so that's why flexibility  
2 is going to be key in terms of the installation in  
3 multi-family.

4 Because even with our new construction, right  
5 out of the gate we're playing soothsayer and going, oh,  
6 well, what if, and we think this is a good job, but we  
7 could be installing an eight-track player.

8 MR. SCHORSKE: Well, I'm just struck by the fact  
9 that you got four non-answers to your question about the  
10 money. And I was the first to not answer.

11 I think this, to me, underscores the issue that,  
12 first of all, there's such diversity, as you well know,  
13 in the upgrade needs. And you're talking, you know, for  
14 a 100-unit building you might be talking that they're  
15 already there and then it's, you know, some tens of  
16 thousands. And if they're not, it's hundreds of  
17 thousands. And it's, you know 30 K to 500 K. And you  
18 don't know until you find out.

19 And this is why having a planning phase, a  
20 funded planning phase that could be, you know, as little  
21 as 50 K, or whatever, for a large property management  
22 organization and/or some intermediaries to go out there  
23 and actually get granular with their cost estimates.  
24 And also, really consider how do we make this property  
25 truly attractive to EV owners and address the chicken

1 and egg issue of the vehicles versus the EVSE, and think  
2 about marketing partnerships or whatever else might be  
3 involved.

4 I mean, I'm struck that you had so many -- maybe  
5 you had more of those Tesla drivers come because you  
6 advertised EVSE readiness, I don't know. EV readiness,  
7 rather but --

8 MS. NITSCHKE: It's a very sexy property so --

9 MR. SCHORSKE: Okay, so that's that. But at any  
10 rate, I do think that to get a good answer to that  
11 question you have to actually dig on a property-by-  
12 property basis and that requires resources.

13 MR. POINTON: So, one of the things that we've  
14 tried to do at the PEVC is to collect case studies in  
15 order to show, you know, the variability of the range of  
16 these projects. Because literally we're talking  
17 everything from mobile home parks to luxury, high-rise  
18 condominiums, if we're truly talking about multi-unit  
19 dwellings.

20 and within that spectrum we're going to have a  
21 lot of different variabilities, as everyone keeps  
22 referring to, and the need for the flexibility.

23 So, where is money best spent from the CEC? Is  
24 it to fund pilot projects that accentuate lower-cost,  
25 innovative design? Or is it to solve a particular

1 community's problem, working with particular  
2 contractors? What do you see it as being?

3 MR. KALB: You know, the case study issue really  
4 relates not to the specifics, but it relates to a  
5 scenario, right? So, it has to be more of if you're an  
6 HOA and you want to make sure that all 300 people on  
7 your property have equal opportunity to charge from the  
8 first person having the opportunity to the last person,  
9 well, that's one scenario. And here's ways of going  
10 about that and case studies that represent that.

11 Other HOAs say, hey, we just want to install ten  
12 chargers and let it go at that, and have everybody --  
13 you know, get some kind of parking police, if you will,  
14 that allows them to come first-come, first-served.

15 The thing is you don't know what's in the mind  
16 of your customer. You don't know how they run their  
17 business. You don't know how they manage their parking.  
18 You don't know the personalities that are involved on-  
19 site. And so, all you can really do is get there and  
20 have a wealth of information to figure out, oh, here's  
21 what they might resonate with. Or to give them three or  
22 four different scenarios and say which might work best  
23 for you as a starting point.

24 So, in terms of funding, I don't see a lot --  
25 again, this is why I say if there was a -- you know, as

1 a business person I have a hard time making money  
2 because multi-family organizations don't generically  
3 want to pay me to go through the what does 25-65 mean,  
4 or how do I develop a policy, or what's at issue for me?

5 And so, I don't have as -- the ability to really  
6 serve those clients who, if I went to them and said,  
7 hey, for free I will work with you for nine months and  
8 help you through the decision making process, and case  
9 studies is a part of that.

10 So, you know, again, if I was thinking  
11 creatively I would want to say maybe the CEC, or the  
12 PUC, or the government has certified 150 people to go  
13 out and work with these organizations and basically fund  
14 them on a per-organization, or whatever it is, and  
15 develop certified plans. And then those certified  
16 plans, at a later date, could actually be funded for  
17 infrastructure.

18 So, you're saying I'm going to fund \$5,000 for  
19 the next six months to get them to say, okay, I'm  
20 agreeing to do it, and that agreement is \$75,000. And  
21 then you can say, okay, well, we'll fund 30, 40, 60  
22 percent of that \$75,000.

23 MR. POINTON: Okay. So, we've run out of time.  
24 I'm going to give Richard and Mary each an opportunity  
25 to make a final comment.

1 MR. NITSCHKE: Oh, no, go for it.

2 MR. SCHORSKE: I have to just repeat a couple of  
3 the highlights here because I think it's so important,  
4 that we first of all acknowledge the concentration in  
5 the business, and how much more cost-efficient it is to  
6 get the bigger properties online, first.

7 When we did the EVSE Study, MUD Study in the Bay  
8 Area, we found out that there's 375 properties that have  
9 74,000 units, all in the 100 K household demographic.  
10 That's incredible concentration. That gives you -- and  
11 74,000 units is obviously a lot more people and it's a  
12 lot more cars, probably 100,000 and more cars.

13 So, if you could get, you know, those 375  
14 properties, a percentage of those on the road, first  
15 with planning, then with infrastructure and then,  
16 ultimately, with some kind of experience, direct  
17 experience of EV that builds momentum for adoption,  
18 you'd have some very exciting efficiencies.

19 But I think you have to be willing to bite off,  
20 you know, the planning phase and the over-sizing, if you  
21 will, for the initial couple years' of demand. And, you  
22 know, we're not there, yet, in terms of the funding  
23 structure, but I hope we can get there.

24 MS. NITSCHKE: I think it's important to look  
25 at, too, in terms of the funding what percent of the

1 cost of the scope of work you're anticipating that the  
2 property owner pay.

3           Typically, these properties will have a budget.  
4 They will have a certain amount of CAPEX dollars,  
5 capitalization, capital dollars that they spend annually  
6 on their property.

7           The first thing that's going to always go is  
8 life safety. So, if there's so much money to be spent,  
9 it's always going to be life safety. And unless there's  
10 a return on the investment, typically those projects  
11 will get pushed back.

12           So, I think where I've seen the most success in  
13 my role in getting projects commissioned is where I can  
14 tell an owner that the project has, at this point in  
15 time, a proven 12-month payback or less. And I know  
16 that's a hard number to achieve when you're talking  
17 about both the infrastructure for the electrical, not  
18 just going from the panel room to the charge station,  
19 but potentially the panel itself.

20           But if you really want property owners to come  
21 to the table, this is where the appetite is.

22           MR. POINTON: Thank you all.

23           Jasna, I'll turn it over to you.

24           MS. BARODY: Well, let me introduce you, Jasna,  
25 I have an introduction for you.

1           Okay, quickly, I'll go through it. She's a  
2 Research Director with CalSTART. Her focus is on  
3 projects demonstrating the use of alternative fuels and  
4 technologies, and transportation, and supporting their  
5 commercialization.

6           She leads the Employer EV Initiative, a program  
7 encouraging adoption of workplace charging and faster  
8 adoption of PEVs.

9           Her expertise includes research in vehicles to  
10 grid power. And she's just, yesterday, had a webinar on  
11 workplace charging.

12           MS. TOMIC: Yeah, I did. We had 120 people  
13 online and go to the meeting, actually, for our  
14 workplace charging webinar. And some of the folks  
15 today, that we have here on our panel, were  
16 participating as well.

17           So, I had a couple of slides. Can I get those?

18           MS. BAROODY: They're coming.

19           MS. TOMIC: Okay. So, Joel and I teamed up  
20 here, actually, and I will say, shamelessly, that I  
21 actually stole a lot of his questions. So, you will see  
22 some of the questions that I introduce here in our  
23 conversation will be very, very similar, because the  
24 issues are somewhat similar actually, and somewhat  
25 different.

1           So, let's just briefly go through the status,  
2 kind of, of workplace charging.

3           Can we go to the next slide, please? Yeah, and  
4 if you can just flip through that.

5           I brought three quotes from OEMs and then  
6 ChargePoint, just kind of emphasizing the importance,  
7 the critical point of workplace charging being arguably  
8 the most important infrastructure strategy to accelerate  
9 adoption and being key in getting more EV miles from  
10 PHEVs. Those are both from GM and Ford.

11           And then how, from ChargePoint, how the rate of  
12 follow-on EVS sales to employers is very high. So, if  
13 you buy a couple, then you buy more afterwards.

14           Can we move to the next slide. The challenges  
15 that remain here, and I have a list of them.  
16 Installation costs are often very high. The business  
17 case is questionable for workplace charging. And I hope  
18 we'll hear a little bit about that, what has motivated  
19 employers to date, to install workplace charging.

20           Then leased property, how do you explain the  
21 value to the property when it's a leased property, not  
22 an owned property.

23           Remote employee garages or lack of garages, or  
24 parking lots in the city environments, especially.

25           And then demand charges, or increase of demand



1 charges. And that's one unique thing, I think, that  
2 does not appear in home charging and does not appear in  
3 multi-unit dwelling, potentially, but does affect  
4 workplace charging.

5           Can we move to the next one? So, I just have  
6 this last slide here, just talking about costs that are  
7 included, because I think is something. And as you can  
8 see, this is a slide that we developed with the  
9 California Plug-In Vehicle Collaborative developed. And  
10 we don't have numbers, we just have low cost to high  
11 cost on EVSE purchase, on installation, on metering, on  
12 operation and maintenance. So, I just want to keep that  
13 in our heads here.

14           And with that, I'd like to quickly proceed and  
15 introduce four panel members that I have. And we have  
16 today, with us, the pleasure of having two publicly-  
17 owned utility representatives, and then two cases of  
18 employers or workplaces that actually, currently have  
19 workplace charging installed, so they can speak from  
20 their side, from the user side of implementation.

21           And I'll quickly introduce all of you. Ms.  
22 Cheri Chastain is Sustainability Manager with Sierra  
23 Nevada Brewing Company. She has been with the company  
24 for over eight years and responsible for educating  
25 employees on environmental issues and programs. Among

1 her many tasks, she's responsible for renewable energy,  
2 managing zero waste efforts, researching and  
3 implementing alternative fuel options, and working  
4 towards water conservation and reuse.

5 Tom Harrigan, Commute Solutions Leader with  
6 Intuit. Tom is a global commute solutions leader in  
7 Intuit Workplace Organization. Intuit recognizes  
8 responsibility to provide responsible commute  
9 alternative to workers. Therefore, Tom manages these  
10 programs in U.S., Canada, Europe, and Asia. And has  
11 worked with great public programs in San Francisco,  
12 Cambridge, Woodland Hills, Santa Monica, London,  
13 Edmonton, et cetera. I'm running out of cities here.

14 I think great case about Intuit, I will add that  
15 they have workplace charging not only in their  
16 California facility, but in other locations through the  
17 country. So, he can speak to that.

18 Bill Boyce is with Sacramento Municipal Utility.  
19 He's the Supervisor of Electric Transportation. I think  
20 Bill got an introduction a little earlier, so I'll just  
21 say he's been with SMUD for the last 14 years. I'm  
22 happy to have Bill on the panel. He's doing some really  
23 creative things at SMUD there, and we're happy to hear  
24 that.

25 And Scott, Briasco. Scott, I actually am

1 missing your little description. Would you add?

2 MR. BRIASCO: So, I'm the Manager of Fleet  
3 Engineering and Electric Transportation at LADWP, so I  
4 oversee a lot of the electric transportation project.  
5 And I've been actively involved in electric  
6 transportation activities for over 25 years at LADWP.

7 MS. TOMIC: Great, thank you.

8 So we have, I guess -- I'm looking at the clock,  
9 it's 2:00. We're going to try and do this in 15 to 20  
10 minutes. I'm looking at Joel whether I get a nod.  
11 Okay.

12 So, we want to -- I want to start with some of  
13 your experiences and kind of an assessment from,  
14 obviously, utility perspective, but just experiences, as  
15 well as implementation and users. Where do you think  
16 workplace charging status is right now in terms of the  
17 path?

18 MR. BOYCE: I think currently a lot of this, and  
19 I think multi-family is also kind of in this, a lot of  
20 the activity right now is really retrofit of chargers in  
21 existing facilities. And usually that's limited to  
22 pretty much deep-pocket employers.

23 So, people have really got to have some money.  
24 They're typically doing it for additional employee  
25 benefits. And I think on your chart you notice the

1 costs are very high.

2           You know, what do I think needs to go to grow  
3 things? I think, really, the segment needs to  
4 encourage, once again, lower-cost solution sets. And as  
5 I alluded to in the morning, you know, I think we need  
6 to find different opportunities, like during new  
7 construction, to get this in. And the current retrofits  
8 into existing facilities, with existing limited  
9 electrical capacity really are huge cost drivers, and  
10 that's going to limit the number.

11           We need to get this built in on the design of  
12 the facility before it goes in and get it more or less  
13 from the ground up.

14           MS. TOMIC: Tom? Are you one of the employers  
15 with deep pockets?

16           MR. HARRIGAN: Well, you know, I'm not going to  
17 say that we have deep pockets, but I'm going to say that  
18 we have adequate resources to meet the needs, which is  
19 more than a lot of people can say.

20           So, one of the things I'm going to pitch later  
21 on is I'm going to pitch small businesses, too, and  
22 small business needs here. But that's beside the point.

23           So, for me, I see the industry as being just at  
24 the beginning of the inflection of the growth portion of  
25 the marketing curve. So we're seeing a lot of growth.

1           I'll give you an example. We just did a massive  
2 expansion, this past year, of our EV infrastructure. We  
3 were going from in the neighborhood of around 19 ports  
4 to up around 40 ports. And what we found is, instead,  
5 we went up to 77 ports across the U.S. All, except for  
6 16 of those, are here in California.

7           In L.A.'s territory, in San Diego Gas &  
8 Electric's territory, in PG&E's territory, as well, so  
9 we're all over the place on that.

10           But in terms of what I think we need, I think we  
11 need better, faster, cheaper, cleaner technology that's  
12 out there. I think we also need some incentives that  
13 are actually tax free.

14           And one of things, I'm going to throw a plug in  
15 here, is it kills me every year to do the California 540  
16 adjustments and add back in the transit subsidy that I  
17 get each year as an adjustment to my income.

18           I mean, the IRS realizes that that's helping the  
19 environment out. It seems like California doesn't  
20 realize that, which seems inconsistent with some of the  
21 other programs that we have in the state.

22           And I think that's pretty much it.

23           MS. TOMIC: Okay.

24           MS. CHASTAIN: So, from my perspective, I mean I  
25 think we're at the very beginning of workplace charging.

1 And the businesses that I talk to, and my colleagues,  
2 and my community members, we're one of two workplace  
3 charging stations in Butte County, the entire county.  
4 So, it's -- I think it's at its infancy, especially in  
5 rural communities, which is where we are.

6 We installed our workplace chargers in 2009.  
7 Not a single employee has purchased an electric vehicle  
8 since. So, I think there's what Richard was talking  
9 about with people not either being aware, or not wanting  
10 to, not wanting to take that risk on buying the electric  
11 vehicles.

12 So, I see a lot of businesses that don't want to  
13 install them simply because of the cost, but there's no  
14 demand for them. Their employees aren't demanding them,  
15 they're not asking for them.

16 But I think if the employees had them and they  
17 were asking for them, the employers might consider  
18 charging stations. So, I think that's a big problem  
19 that I've seen.

20 And I'm glad that you brought up the peak demand  
21 charges because that's another big issue that I've seen  
22 is workplace charging takes place during those peak  
23 hours. Residential and multi-unit dwellings, they're  
24 typically in those off-peak times. The workplace takes  
25 place during those peak hours, so those businesses that

1 are installing those stations are going to see much  
2 higher demand charges.

3 And that's a risk that nobody wants to take on.  
4 Yes, we'll install these charges and, yeah, I want to  
5 pay my utility more money for it. Nobody wants to do  
6 that.

7 So, I think, you know, especially utility rates  
8 for those charging stations should be offered to  
9 workplaces who are willing to make that investment.

10 MR. BRIASCO: Well, for the Los Angeles  
11 Department of Water and Power, we encourage workplace  
12 charging. We have quite a bit of it at our main office  
13 building, so we're right now at 52 level 2 chargers that  
14 are strictly dedicated for employees for workplace  
15 charging.

16 And we have another 24 chargers, level 2, that  
17 are in our public lot that can also be shared with  
18 employees. So, that's right at 76. And of those, 24  
19 have just been installed in the last couple of weeks.

20 What we're seeing is that as we install more  
21 chargers, they're getting utilized fully, to the point  
22 where sometimes, you know, if you come in late, you may  
23 have a problem finding a charger.

24 So, we see it as, you know, a situation where if  
25 you build it, they will come. Certainly, it's free

1 charging, so that's a huge incentive.

2 We also, in our main office building, have a DC  
3 fast charger. And then we're kind of spreading out to  
4 our other locations and installing charging stations  
5 beyond just our main office building.

6 So, you know, we see the environmental benefits.  
7 Obviously, as a utility promoting this, we think it's  
8 important to kind of set the example.

9 One of the things that we offer our customers to  
10 help promote the installation of charging stations is a  
11 rebate. So, for the installation of a wall mount, it's  
12 \$750, for a pedestal it's \$1,000. So, that's for MUDs,  
13 that's for workplace charging.

14 And we're kind of looking at that. We're not  
15 seeing a huge uptake on the commercial part of it. It's  
16 mainly been going to towards residential.

17 So, as we look at ways of trying to improve the  
18 penetration of workplace charging, you know, what do we  
19 need to increase that dollar amount and can we leverage  
20 CEC funding to help us do that.

21 Some important things, we talk about, you know,  
22 the lower-cost installations. In Los Angeles we have a  
23 building, a green building ordinance that requires that  
24 five percent of all new parking spaces at least be EV  
25 ready. So, that's to get that initial infrastructure in



1 the ground during construction, when it's really not  
2 that expensive. Then, the owner can come back and  
3 basically hang the hardware and it becomes really kind  
4 of a cheaper installation. Of course, the retrofits are  
5 more expensive.

6 I heard a little bit about Rule 2202, and the  
7 Los Angeles or South Coast Air Basin providing those  
8 incentives to employers that are large, that fall under  
9 that ride-share rule to put charging in, and really get  
10 regulatory compliance credits towards doing that. So,  
11 we think that's important to really reward large  
12 employers for kind of taking that step.

13 And, you know, I think we are kind of at the  
14 early stages here. The larger companies, that are kind  
15 of stepping up, that have the money and want to do this.  
16 But as more and more vehicles are kind of hitting the  
17 streets, and you have people that are approaching their  
18 employers and asking for, hey, you know, would you do  
19 this, put in this workplace charging? We think it's  
20 that pull that's going to kind of help the marketplace.

21 MS. TOMIC: Okay. So, when I introduced my  
22 slides, I was talking about the cost in the business  
23 case being difficult and all the different cost elements  
24 that exist in a project of workplace charging.

25 Where do you think should CEC money, next grant

1 cycle money, be focused on to really aid the process.

2 MR. BOYCE: Let's throw out a little bit of a  
3 curve ball here. Actually, I think there could also be  
4 some technology that could come to the table. And  
5 there's a few people, and I know DOE is working on tis,  
6 which is basically some devices that can go back at the  
7 transformer and basically make sure that you could, you  
8 know, modulate additional load at a facility and put on  
9 additional load at a facility, but never over-go the  
10 nameplate of the transformer.

11 And where this type of stuff is, it's like, say,  
12 there's no capacity on the transformer right now to  
13 handle any charging. And so, but during the day,  
14 certain times of the day the transformer's only loaded  
15 to a 25-percent capacity. Is there a way that, you  
16 know, in those off-peak times, or whatever, you could  
17 actually use it in different applications.

18 And I know DOE's been playing with a device that  
19 has the ability to more or less modulate load going to  
20 the charger to not ever go over the nameplate of the  
21 transformer but, hey, during times when it's not loaded  
22 up as much more charging occurs.

23 Those are kind of one where, you know, as a  
24 utility guy we don't necessarily like that, but it could  
25 really free up the ability to not have to go in and do

1 massive facility upgrades if you're able to make it  
2 work.

3           And a lot of those backbones are, you know, some  
4 of the real expensive stuff that nobody wants to fund.  
5 And, anyway, I think there is some technology that could  
6 really be brought to bear in that area, which is how can  
7 you add a lot more load and not go over the nameplate of  
8 a transformer.

9           MS. TOMIC: So, Bill, is your suggestion, then,  
10 that some of the money goes to fund some of the  
11 technology, deployment and testing of such new  
12 technology?

13           MR. BOYCE: Yeah, I think it would behoove us to  
14 try to get some more experience with that. You know,  
15 try and figure out how to do it in a limited, low-risk  
16 demo. You know, that also addresses things like  
17 additional demand charges and other things like that.

18           But more than anything, I think a lot of the  
19 barriers here are just the sheer high cost of getting  
20 wire into the ground. And how can you really work on  
21 that? And like I said, if you don't have to add  
22 additional, major electric capacity in a retrofit, then  
23 those are some of the solutions you can have. And,  
24 anyway, I would --

25           MS. TOMIC: Yeah, I would add to that another

1 recent example of a technology change, as not thinking  
2 of chargers as fixed chargers, but mobile charges.

3 MR. BOYCE: Yeah.

4 MS. TOMIC: You know, so the lines that go to  
5 the building or to the location are single lines, and  
6 then this little thing, or big thing, moves around and  
7 goes to where the vehicle is, rather than the vehicle  
8 moving around to the chargers.

9 MR. BOYCE: Definitely not having fixed assets  
10 is another flexibility. But, you know, it's -- you  
11 know, some of the stuff that I know we haven't looked  
12 at, in a sense in the infrastructure world, that could  
13 also be something we should really start to look at a  
14 little bit differently.

15 MS. TOMIC: Okay. So, Tom?

16 MR. HARRIGAN: So, Bill hit the nail on the  
17 head. John and I were actually talking, John Kalb and I  
18 were talking at one of the breaks that one of our big  
19 constraints is the electrical capacity. So, you hit the  
20 nail on the head for that one.

21 For us, the other thing would be incentivizing  
22 the installation costs. Because for us, we've actually  
23 found that as of last year the cost of installing a  
24 system has bypassed the cost of the hardware for the  
25 systems that are out there.

1 MS. CHASTAIN: I would agree with both of those  
2 answers, technology and the infrastructure within the  
3 workplace is a big issue, especially if it's an older  
4 facility, an older building that doesn't have the  
5 capacity.

6 The tax credits, I mean, you might have a little  
7 more to say on that one, but I think that would  
8 definitely help in the workplace to get those chargers  
9 installed.

10 But I also think there does need to be more  
11 education for the potential drivers out there. You  
12 know, like I said, we've had our chargers for, it will  
13 be six years in April, and not a single employee has  
14 purchased a vehicle.

15 MS. TOMIC: So, they're actually empty, nobody's  
16 using them right now or --

17 MS. CHASTAIN: We have a couple company vehicles  
18 that we charge with them.

19 MS. TOMIC: I see.

20 MS. CHASTAIN: And there's a couple people in  
21 the community that use them, but there isn't any  
22 employees that have vehicles. So, more education and  
23 outreach on that front I think would also help to drive  
24 that workplace making that investment in their  
25 infrastructure, and in that equipment. And it's a

1 benefit for employees, so it will help with retention  
2 and attitude at the workplace, as well.

3 MS. TOMIC: So, what motivated you to install  
4 them, I'm curious?

5 MS. CHASTAIN: We were approached by a community  
6 member, who started an electric vehicle dealership. And  
7 it went under with the rest of the economy. But he, you  
8 know, approached us and said we're trying to sell  
9 electric vehicles in the community --

10 MS. TOMIC: I see.

11 MS. CHASTAIN: -- would you please install a  
12 charger to help with the infrastructure and we said  
13 sure.

14 MS. TOMIC: Okay.

15 MR. BRIASCO: So, one of the issues we've been  
16 kind of kicking around is, you know, through the  
17 incentives and through our rebate program how do you get  
18 folks to kind of step up, and what do those levels need  
19 to be. And how does that work with the Energy  
20 Commission PON process.

21 We've been sort of talking about this with --  
22 through an organization that's the Southern California  
23 Public Power Authority, and it's the municipal utilities  
24 in the Southern California Region.

25 And if we were to have sort of a regional rebate

1 program, you know, could we make that work and could we  
2 administer that, somehow, through the CEC PON process.

3 So, I think some of the challenges with the  
4 process right now is identifying properties and really  
5 having everything sort of in your submittal identified  
6 very clearly as far as what locations, and how many  
7 chargers you're installing.

8 But if it were more flexible, where an  
9 organization could establish some criteria, and get a  
10 certain amount of money to provide rebates to the region  
11 for workplace charging, then you could essentially  
12 facilitate -- we think, facilitate that process  
13 regionally in a much easier way.

14 So, you know, it's something to maybe think  
15 about. And maybe if it's not an organization like  
16 SCAPA, or it could be an air quality management  
17 district, but more of a rebate process.

18 MS. TOMIC: And a rebate process for which piece  
19 of the -- for the installation or for the whole package?

20 MR. BRIASCO: For both. I mean it could be a  
21 percentage of both. I mean right now what we're  
22 offering, it's really just to cover the charger. At DWP  
23 it's \$750, so that's really for a wall mount, or \$1,000  
24 for a pedestal. You know, for a very inexpensive type  
25 of a charger.

1           But I think you would want to establish a higher  
2 level and include some money, obviously, for the  
3 installation component, too.

4           MS. TOMIC: Okay, so we'll go one more question,  
5 Joel, but everybody promises to be short and brief.

6           (Laughter)

7           MR. POINTON: So, how many questions do we have  
8 left?

9           MS. TOMIC: Lots. Well, lots, maybe.

10          Okay, so who do you think -- one of the things  
11 that CEC likes to know is like where should they direct  
12 money so that it really reaches at the important point  
13 of use. Who do you think should be the recipient of any  
14 monies, any funding support for workplace charging, in  
15 the workplace charging grant? And it doesn't have to be  
16 the utility.

17          MR. BOYCE: Well, I'm sorry, you know, part of  
18 me wants to say anybody that's willing to put in the  
19 infrastructure.

20          But I think we also need to have models that  
21 kind of move beyond what I would say would be these  
22 deep-pocket companies. And it moves it out to areas  
23 where there's more exposure.

24          And particularly, when you're starting to think  
25 about disadvantages communities, you know, you need to



1 move it into those places so people see it.

2           You know, kind of interesting, build it and they  
3 well come, you know, our experience that we've had is  
4 that as soon as we put in our workplace charging it go  
5 overrun.

6           But, you know, I think trying to find models for  
7 smaller or medium-sized business is, once again, is one  
8 of the questions, you know, can you get it into the  
9 disadvantaged communities?

10           You know, employers that are trying to locate  
11 their -- you know, maybe they're eligible for an  
12 additional incentive.

13           MS. TOMIC: So, should the community be  
14 eligible? Would you suggest giving the money to the  
15 community and the community distributing it to the  
16 workplace or, I'm just wondering?

17           MR. BOYCE: I think -- I don't know, it has to  
18 go to workplaces. You know, if there's strong enough  
19 language that it has to be passed all the way down,  
20 versus if it just goes to a community I get worried it  
21 goes, you know, in front of the library. Not that  
22 that's bad. But if you're trying to truly move  
23 workplace, that's a different issue.

24           MR. HARRIGAN: Okay, so I'll make it quick. I  
25 already pitched for small businesses. I'm going to

1 pitch for nonprofits, as well.

2           The thing I want to do is I want to take a  
3 little bit of time just to talk about the minority and  
4 disadvantaged business areas in there.

5           I think one of the things that we could get  
6 caught in is the chicken-or-the-egg argument. And even  
7 if there's no demand in those areas today, if we fail to  
8 build the infrastructure, we're going to ensure that  
9 there's going to be no demand in those areas tomorrow.

10           So, I'd like to make a pitch that says, yeah, we  
11 should take a look at those areas, the under-served  
12 areas, and see if we could do more for them.

13           MS. CHASTAIN: Yeah, I completely agree with  
14 that. I mean, coming from a very rural community in  
15 Northern California, I think having funding like this  
16 directed at those communities would really help increase  
17 the availability of workplace charging.

18           And as for, you know, how do those funds get  
19 transferred and, you know, maybe it becomes part of  
20 economic development packages for those communities. As  
21 they're trying to recruit businesses to locate in their  
22 communities, it could become part of that incentive to  
23 actually draw more to those communities.

24           MR. BRIASCO: And I guess I would just kind of  
25 reiterate, again, that approach of a rebate to really

1 establishing a process to being able to reach out to  
2 those really small businesses, and those disadvantaged  
3 communities that, you know, they don't have the  
4 wherewithal to submit a really complicated application  
5 for a large number of chargers but if they're -- to the  
6 Energy Commission. But if they're in a position to  
7 install two or three chargers and they can pull together  
8 the budget to do that, they're essentially reimbursed  
9 for a portion of that through a simplified rebate  
10 process.

11 MS. TOMIC: And I think we'll move to questions  
12 with the audience. I just wanted to comment on the  
13 monies to communities.

14 In Pasadena, where CalSTART is headquartered, we  
15 have -- anyway, the City of Pasadena got money that they  
16 were distributing to workplaces.

17 However, they had a requirement that you had to  
18 have it open to the public for three years, which really  
19 disincentivized a whole bunch of workplaces because they  
20 didn't have parking lots that were open to the public.

21 So, one needs to look at the consequences of  
22 some of the rulings.

23 MS. POINTON: So, a show of hands, who would  
24 like to ask a question? Sir?

25 MS. TOMIC: And can you also introduce, quickly,

1 yourself when you ask a question? Although, we know  
2 you, Charlie.

3 (Laughter)

4 MR. BOTSFORD: Charlie Botsford, AeroVironment.  
5 Somebody mentioned the demand chargers at workplaces.  
6 There's a program, a pilot program that Hawaii Electric  
7 Company has for two pilot rates to get rid of demand  
8 charges, which I think is really something that should  
9 be watched and maybe considered by CPUC.

10 Demand charges for DC fast chargers and demand  
11 charges for, I think, level 2 workplace chargers. So,  
12 that's -- yeah, demand chargers are a hit and everybody  
13 thinks of them as being a problem with DC fast chargers.  
14 Workplace chargers, too. So, it's something that  
15 wouldn't cost anything, except maybe the utilities.

16 MR. BOYCE: Just to let you know, Charlie, we're  
17 currently in the process of developing a pilot rate that  
18 gets rid of the demand charge.

19 A municipal utility, we still have to reach cost  
20 recovery, so it's going to show up in an energy rate,  
21 but it attempts to do that. And, you know, recognize  
22 when there's very low utilization at the very beginning,  
23 the demand charge is an issue. But as, you know, usage  
24 of these increases it actually flip-flops in the  
25 equation of how ratemaking goes.

1           But we hope to get that rolled out sometime in  
2 the next -- within the next year or six months.

3           MR. BOTSFORD: Yeah, I think Kinko (phonetic)  
4 had maybe some demand response strings attached to it.

5           MR. BOYCE: Yeah, I won't say that we're looking  
6 at that, currently, but demand charges on high-level  
7 charges are always something we look at in just general  
8 protection of the grid.

9           MR. POINTON: And do we have a question over  
10 here, if you could make your way towards the microphone.

11           MR. WILLIAMS: Thank you. Bill Williams, with  
12 Telephonics.

13           The main question is, is I think I'm meeting  
14 with a lot of people about workplace charging. I think  
15 once they get over the sticker shock of their initial  
16 meeting with a large network charging company, I try to  
17 explain to them that they could really keep it simple.  
18 One is with level 1. Obviously, a 20- to 30-mile could  
19 be replaced in about four to five hours with level 1.

20           So, I ask why the Commission doesn't have any  
21 level 1 funding.

22           And secondly is that airports and hotels are  
23 also workplace charging, so we need to consider  
24 incentivizing airports to put in, again, level 1,  
25 because average stay is two and a half days. And that's

1 where a lot of EV commuters would be happy to park if  
2 they knew that one was available.

3           Instead of two or three \$5,000 chargers, you  
4 could put in about 10 or 20 of a lower-priced, level 1  
5 charger.

6           Also, the peak demand, you can get away with  
7 level 2. And don't go to a 40-amp level 2. Stay with a  
8 lower power level 2. So, there's other alternatives.

9           But the main funding, even the lead  
10 certification is for a level 2, only. So, I just want  
11 to speak up for level 1. Thanks.

12           MR. POINTON: Do we have a question?

13           MR. WILLIAMS: Can we get level 1 funding?

14           MR. REINECCIUS: Hi, Stacey Reineccius, Power  
15 Tree.

16           Two questions. One is --

17           MR. POINTON: We'll limit you to one because of  
18 the time, please.

19           MR. REINECCIUS: Okay, let me pick then. One of  
20 the key costs is time, in time to installation. There  
21 are things that utilities could do. For example,  
22 provide advanced data as opposed to post-study data or  
23 post-interconnection agreement date about the type of  
24 connection available at a given property.

25           So, what is the current load? There's stuff

1 like this in the RAM maps for solar.

2 Can we get something where the utility could say  
3 for this building, this MUD, or this workplace here's  
4 the service drop, here's its current level of load,  
5 versus what the utility thinks the service capacity is?

6 That would save a lot of time. Just a very  
7 simple thing. It's in the existing databases. Making  
8 that kind of data available quickly would save months.

9 MR. POINTON: I'll just speak to on our team we  
10 do have an electrical engineer on staff who literally  
11 works in the field with projects when they come to the  
12 region, to help identify particular transformers and the  
13 lower-cost alternatives in the region.

14 So, we have tried to provide that support  
15 service, in addition to the usual planning functions  
16 that you encountered, as you've outlined.

17 MR. ZEREGA: Hi, Matt Zerega from Liberty  
18 PlugIns.

19 I think earlier today Charlie said a lot about  
20 economics and Brett, I think, mentioned a couple of  
21 interesting statistics about people's reactions to  
22 pricing. So, we know pricing is important and I think  
23 it's a commonly held belief that the opportunity to save  
24 money on fuel is compelling to people considering an EV.

25 So my question is this, and I'm a big fan of

1 math. Use some math today, you know like a plug-in  
2 Prius at 50-miles-a-gallon. The current break-even  
3 price on electricity is about 18 to 20 cents a kilowatt  
4 hour.

5           And for most rates, most utilities, especially  
6 in California, I don't even think that covers the  
7 electricity price, so you're not going to start covering  
8 the cost of your equipment. So, it's very, very  
9 challenging, but price is important.

10           So my question is this, on the panel and the  
11 Commission, is what are the notions and the objectives  
12 behind this funding with regard to the price that the  
13 drivers will feel at these new facilities that are  
14 funded? What are the notions or what are the  
15 objectives, and the hopes?

16           MS. TOMIC: Matt, can you comment, just one  
17 comment on that. Do we think the current gasoline and  
18 current diesel price is realistic and true?

19           MR. ZEREGA: Well, I mean that will open that  
20 whole discussion.

21           MS. TOMIC: I know, but so it compares some --

22           MR. ZEREGA: At \$14-a-barrel production cost in  
23 Saudi Arabia and it --

24           MS. TOMIC: Yeah, I'm just saying I don't think  
25 it's fair to compare it to two-and-a-half-dollars-a-



1 gallon price.

2 MR. ZEREGA: Yeah, and I'm certainly not trying  
3 to convey that that is the most important thing to most  
4 drivers. I'm simply trying to convey that -- to support  
5 something that was cited by Brett, earlier, that price  
6 is important to some segment.

7 And I think that when we start talking about  
8 mass adoption that price for fuel is important.

9 And so, it just begs the question about what are  
10 our notions and what are our objectives with regard to  
11 this new infrastructure? Are we going to put a price on  
12 it? Are we going to insist that the price remains below  
13 a certain level? Do we not care? What are our notions  
14 and what are our objectives with regard to the price  
15 paid by the drivers?

16 MR. BOYCE: I'm going to jump in on this one a  
17 little bit. Because on our workplace charging we  
18 actually have a fee. And we're trying to do it in a  
19 very low-cost way, so we don't have any sort of network  
20 Smart charging. It's all just plain level 1 and level 2  
21 dumb charging. And employees essentially enroll in a  
22 payroll deduction. They get a placard. They put that  
23 placard on their review mirror and that then allows them  
24 to charge.

25 You know, there's a lot of thing we're learning

1 and I guess my point is I don't think we have a lot of  
2 knowledge on different approaches there. What we're  
3 finding is it's \$5.00 a pay period to be allowed to  
4 charge there. Well, as soon as you have that fixed fee  
5 it's almost, in my mind, as bad as free charging.

6           Because if it's fixed fee, as soon as you pay  
7 your money, well, now I want to maximize every kilowatt  
8 hour I can get out of that fixed fee. And you've got  
9 all the same problems that we have when it's free  
10 charging which is everybody tries to take advantage of  
11 it.

12           The other thing we had thought it would do was  
13 kind of limit it to people that could have just  
14 supplement charging. They're the ones that really need  
15 it. They're outside of an 80-mile range and couldn't  
16 get back home.

17           But like I said, as soon as you add a fee  
18 people, well, I paid for it, I should get it, and I  
19 don't want to do that. And they start making that their  
20 primary charging.

21           The second thing that I think we really are  
22 going to need to think about, and we're seeing this, is  
23 a lot of the people that use our charging live outside  
24 of SMUD service territory, where rates are a lot higher.  
25 So, there's kind of a radar arbitrage going on, and

1 people are going to take all that. And I'll take the  
2 PG&E customers any day of the week.

3 (Laughter)

4 MR. BOYCE: But anyway, you get to the fact that  
5 I don't think we know a lot about rates. I don't think  
6 we quite know. Right now it's all free, so everybody  
7 does that.

8 But the free charging leads to maxed out  
9 infrastructure, it gets over-subscribed. You know, that  
10 starts to lead to a lot of bad relations of who gets it,  
11 who doesn't.

12 And we're going to need to do a lot more case  
13 studies on just rate structures to figure out how to  
14 self-manage it. Because right now, you know, a lot of  
15 the systems are too expensive, in my opinion. Fully  
16 networked, that's more than the electricity, itself,  
17 going through there.

18 So, an employer's choice, do I pay this and  
19 double the price or do I just give it away for free.  
20 And, you know, most of it's going out for free, now.

21 So, I don't think we know a lot about that. I  
22 think that some more technologies are going to have to  
23 come out with lower cost payment networks to really  
24 drive that cost out so it is more efficient.

25 MR. HARRIGAN: Two really quick comments from

1 me. We've found that what people say in surveys and  
2 what they actually do aren't necessarily the same.

3 We keep hearing that cost isn't important on the  
4 surveys. Yet, when we did our infrastructure upgrade we  
5 had 70 drives across the U.S. that were driving EVs. On  
6 August 1st, we switched from charging a dollar-and-a-  
7 half-an-hour per charge to free charging. And now we  
8 have 252 registered drivers.

9 MR. BRIASCO: You know, it's an interesting  
10 discussion and I think you're right, I don't think gas  
11 is going to stay down at \$2.40 a gallon.

12 But you have some folks that are at the point,  
13 now -- you know, I was at a luncheon with a co-worker.  
14 I drive a VOLT, and it's great for me. I charge at  
15 home. I get to work, I charge at work and it's 35 miles  
16 each way. So, I have 27,000 miles on the car, I use a  
17 total of 35 gallons of gas.

18 But the co-worker that has the VOLT, you know,  
19 we started talking about the experience and he says, you  
20 know, I don't charge this thing at home anymore because  
21 the cost of the electricity at home is more than the  
22 gas, so I'm just running on gas.

23 So, that was a little bit disturbing. So, you  
24 have folks that have plug-in, hybrid vehicles that are  
25 not using them on electric because for them, depending

1 on what service territory they're in, and what rate  
2 structure they're on the cost of the electricity can  
3 actually be more expensive than the cost of gas right  
4 now, at \$2.40 a gallon. Which, again, is not going to  
5 stay there.

6 So, I think that the issue is, is that if you  
7 price the charging too high, whether it's at home, or if  
8 it's workplace, or MUD charging, people aren't going to  
9 use it. So, you're going to spend all that money  
10 putting that charging in and it may not get utilized.

11 But it's also important to be able to manage the  
12 free charging issue and I understand what Bill is  
13 saying.

14 MS. BAROODY: Here's the gentleman that I told  
15 to go park across the street because there would be  
16 plenty of EV charging at a dollar and a quarter an hour.  
17 There's usually nobody there, but today it was full.  
18 So, I'm sorry.

19 MR. MIKE HARRIGAN: I think everybody here  
20 probably drove an EV and parked over there.

21 So, my question is in regards to how do we get  
22 better utilization of the existing and future charging  
23 infrastructure?

24 If you talk to the folks at Google, they say  
25 they get about 1.2 to 1.3 charges per day, per charging

1 port. And the vast majority of those charges are an  
2 hour to two hours.

3 So, clearly, in an eight-hour workday there's at  
4 least a chance to get three or four charges per charging  
5 station in. And this would vastly simplify the amount  
6 of infrastructure we need or lessen the amount of  
7 infrastructure.

8 And solutions can be really simple. Like, I  
9 mean, people are writing notes to each other right now,  
10 at workplaces. But we could maybe do a better job of  
11 that with technology. Maybe have the charging station  
12 signal the waiting driver when they can come and unplug  
13 the guy that's plugged in, and plug their own car in,  
14 that sort of thing.

15 Any experience there or any suggestions there?

16 MR. BRIASCO: So for us, at our main office  
17 building, I kind of mentioned that we have one area  
18 that's kind of a shared public and employee parking area  
19 that has some charging stations.

20 So, we limit the charging on those stations to  
21 four hours, so you get that turnover, that cycling.

22 And they're dumb chargers and there's basically  
23 a gate attendant and you get a ticket. And you get a  
24 placard and you basically put it on your dash and you  
25 get to use the charging station.

1           And if you stay more than four hours, then you  
2 start paying the standard parking rates for the lot,  
3 which for downtown L.A. it's pretty expensive.

4           So, that's an inexpensive, simple solution. You  
5 know, it may not work for all employee parking. But in  
6 that situation it actually works and it works well. So,  
7 we get that turnover and more utilization out of those  
8 chargers.

9           MR. POINTON: Yeah, our load-tech solution at  
10 this point is each employee gets a time wheel, and they  
11 dial when their charging is done. And they have to have  
12 that cell phone number on that. It goes on the  
13 dashboard, so that another employee that anticipates  
14 they need the charging, they know who's going to be done  
15 and when they can call that employee.

16           Another way is to move cords, not vehicles, and  
17 position the charging unit so that other vehicles can  
18 park adjacent. And when they see the light is off and  
19 you're done charging, on your dashboard or wherever your  
20 indicator light is, then it can be moved to the next  
21 vehicle.

22           MS. TOMIC: I was going to say, yesterday, the  
23 webinar I had, Disney was on the webinar, and they have  
24 a penalty after three or four hours, I think, they have  
25 a penalty that they charge. I forget what the number

1 was, but that seems to work. And so that's one  
2 solution.

3           The other one is either move the cord or have  
4 one of these mobile or semi-mobile chargers that come to  
5 the vehicle.

6           MR. SCHORSKE: Well, so as you might have heard,  
7 Mike, I understand the next generation of ChargePoint  
8 chargers is going to have a text message that can be  
9 sent to the owner when the -- or rather, to someone who  
10 wants to use that charger as to when the previous driver  
11 has completed their charging.

12           (Off-record comment)

13           MR. SCHORSKE: I read it as that they were going  
14 to be implementing that with a suite of other things.  
15 Maybe we have to go back, maybe we both received that e-  
16 mail.

17           And then, also, interestingly, I've seen in the  
18 past that Ford had a kind of a code of etiquette that  
19 they put out with their EVs, their BEVs that said, you  
20 know, please include a note as to whether it's okay to  
21 uncouple the charger at the end of the charge session.

22           And I haven't seen those deployed, let alone,  
23 your solution, Joel, which I think is great. But there  
24 seems to be a need for the load-tech, as well.

25           MS. NITSCHKE: Can I just say for multi-family,



1 because we are sometimes treated as the red-headed step-  
2 child of small commercial and commercial, that none of  
3 those plans will work in our arena. People treat it as  
4 it's their home. They want to come home, they want to  
5 plug in, they want to go into their home and they don't  
6 want to come out in four hours and move their vehicle.

7           So, just when you are administrating how you are  
8 doing this funding, don't assume that what will work in  
9 the workplace, which will work very effectively because  
10 people want to go outside after four hours, that maybe  
11 at midnight you don't want to move your car if you got  
12 home at 8:00 p.m.

13           MS. BAROODY: Great. I think we have time, we  
14 have two more questions here, and then one on the WebEx.  
15 So, if you don't mind, is that okay with you?

16           MR. POINTON: It's your show.

17           MR. NICHOLAS: Following up, Michael Nicholas,  
18 U.C. Davis. Following up on what Scott said, you said,  
19 all of the sudden you put in all these charges and then  
20 they were over-subscribed fairly quickly.

21           And to me what that says, people were going to  
22 buy the cars whether or not the charging was at work,  
23 anyway. That's kind of an open question.

24           And kind of on the issue of congestion  
25 management. Is it the presence of the charger which

1 makes a difference? Or if we actually charge a price  
2 for it, let's say price parity with home, would that  
3 actually provide the same incentive?

4 And then a question to the panel, if we see  
5 someone switch from home to work, for all their  
6 charging, is that a market failure? Is that a failure  
7 of the system? Is it accomplishing the goals that we  
8 want? That's an open question, what do you guys think?

9 MR. BRIASCO: You know, I think if there was a  
10 nominal fee that people still would get the vehicles.  
11 And it's not just the free charging. It's all the  
12 incentives that are out there for folks. It's the  
13 access, it's the state and federal incentives, and the  
14 low-cost leases.

15 So, you know, I think a small charge that's at  
16 parity with home charging, I think would be acceptable  
17 to most people.

18 For me, again, it's being able to utilize a  
19 plug-in hybrid vehicle and utilize it as a pure EV,  
20 where if I didn't have workplace charging that wouldn't  
21 happen. I probably -- if I wasn't involved in the  
22 program, I probably wouldn't get that vehicle. And, you  
23 know, a vehicle like the LEAF may not have enough range  
24 for me. So, you know, I'm probably stuck with a gas  
25 vehicle but --

1 (Off-mic comment)

2 MR. BRIASCO: I do. And I think you're right, I  
3 think people that have pure EVs, when they have free  
4 charging at work, they're not going to charge at home.  
5 They're going to come to work and they're going to  
6 charge at work. Yeah, depending on how far they are,  
7 that's right.

8 MR. POINTON: Again, we're making assumptions  
9 here. At our workplace charging, we have dynamic  
10 pricing for our employees when they're charging. So,  
11 the load management aspect is worked into that, as well.  
12 So, they pay per hour. They can do it through a web  
13 portal. They can do it by setting, for their profile,  
14 that they're not willing to pay over a certain price per  
15 kilowatt hour. And so, therefore, it's self-managing in  
16 that concept.

17 So, people charge when it's appropriate because  
18 that's when it's the lowest price.

19 So, it's a win/win on either side. You're being  
20 able to charge at work during the periods when it has  
21 the least impact.

22 (Off-mic comment)

23 MR. POINTON: Always the question, yes. But the  
24 load management aspect will become more and more  
25 important as we go into the future.

1 MS. TOMIC: It seems like, you know, one can  
2 always game the system. No matter how well you design  
3 it, somebody finds a way to go around it. So, we'll  
4 just have to keep working with it.

5 MR. HALL: Guy Hall, President of Sacramento  
6 Electric Vehicles. This has been a great panel, a lot  
7 of great ideas, and I think it's a terrific opportunity  
8 to hear this and have the interchange.

9 It's been pointed out that the bar for a lot of  
10 businesses to participate in the building out  
11 infrastructure, we want to keep that bar as low as  
12 possible. The business case is somewhat tenuous, at  
13 best, in many cases.

14 I want to caution a little bit. And I know in  
15 many respects it's worked effectively, but I want to  
16 caution a little bit on the idea of the penalty for  
17 being in a spot after a certain number of hours as a  
18 solution, or higher fees, or somewhat the idea to have  
19 people continually moving their cars, or even an  
20 infrastructure set up where they communicate among  
21 themselves. It doesn't work in many cases. They can  
22 add overhead to the business, an organization, and it's  
23 a cost that they're not certain they always want to  
24 incur.

25 As an example, my wife is a labor delivery

1 nurse. You can picture her saying hold it, I'm at the  
2 four-hour mark. Just kind of hold it right there and  
3 she's going to try to decide whether she should incur  
4 this, you know, four or five dollar penalty or try to  
5 put the brakes on.

6 (Laughter)

7 MR. HALL: And that's one case. I've heard a  
8 number of other firms that have got professionals and  
9 such that are in the middle of meetings, issues. Again,  
10 homeowners, or people that live in the condos that don't  
11 want to get up in the middle of the night and try to  
12 move their car.

13 So, I think it begs more to level 1 charging the  
14 whole day, or Smart chargers that can allocate the load,  
15 or a way that someone can actually unplug -- you know,  
16 unplug someone's car safely, and amiably, and charge.

17 So, be conscious about the penalty to try to  
18 enforce a behavior to have people to move their cars  
19 quickly because that may be counter to the  
20 organizational goals. Thank you.

21 MS. BAROODY: Thanks, Guy, for that dramatic  
22 example.

23 Okay, we have time for one on the WebEx.

24 MR. LERMAN: So, this question is from Karros,  
25 who's representing General Motors. His question is for

1 both MUD and the Workplace Panels. He says that General  
2 Motors believes some of the discussions around funding  
3 planning efforts are put in considerations.

4 He's curious if the panelists envision this as a  
5 way to help accelerate IOU and POU plans to install  
6 charging and, also, if these planning efforts could be  
7 effective tools for those groups?

8 MS. TOMIC: Does Alex have an opinion?

9 (Laughter)

10 MR. BOYCE: At least from SMUD, we're going to  
11 be launching a multi-family and workplace charging  
12 incentive program this year. I mean, Scott's already  
13 had one for quite a bit.

14 But we're really, also trying to move this, like  
15 I said, kind of to a lower, smaller business type to try  
16 to get a feel for how, I'll just say, normal folks that  
17 aren't as motivated really respond to everything. And  
18 we're going to be rolling that over the next two years.

19 You know, part of what you'd really like to do,  
20 and all that's on internal funding, is how can I use  
21 some of that funding to leverage CEC funding. And, you  
22 know, once again there's a lot of things there where I'm  
23 not quite sure how hard we're going to get one company  
24 to commit.

25 A lot of the requirements are, well, I need a

1 hard commitment. You know, it's kind of a chicken-and-  
2 the-egg type of situation with regards to, you know, I  
3 really want a firm project so I know the scope, I know  
4 the cost but, yet, it takes a while for the recruitment.

5 And that, in and of itself, I think is, you  
6 know, an issue that the industry's got to grapple with.  
7 And, you know, do these types of program opportunity  
8 notices arise so we can leverage that funding? You bet.

9 But having the timing work out to make sure that  
10 I've got enough design definition with a multi-family or  
11 a workplace, yeah, it takes six months to probably get  
12 good design definition so I really know what my scope is  
13 to bid.

14 And anyway, there's a lot of boots on the ground  
15 to go do surveys, designs, all the stuff we talked  
16 about, let alone get three-quarters of the way through  
17 some sort of property agreement. Anyway, there's a lot  
18 involved.

19 So, to the extent that things like a program  
20 opportunity notice can recognize that, I think would be,  
21 you know, welcome in the flexibility regime.

22 MR. POINTON: And I think you're aware, as you  
23 heard Adam Langdon outline today, SDG&E is one of two  
24 IOUs that has an application before the CPUC right now,  
25 looking at -- our particular application is looking at

1 the load management aspect, combined with the dynamic  
2 pricing.

3           These are exactly the type of pilot programs  
4 that are needed to investigate and look at expanding the  
5 arsenal of solutions for both multi-unit dwelling and  
6 for workplace.

7           MR. BRIASCO: The funding from the Energy  
8 Commission is -- I think is really important for us, the  
9 City of Los Angeles, as a municipal agency. You know,  
10 once those program opportunities, you know, sort of hit  
11 the street, they get a lot of attention.

12           So, you start seeing motions from the city  
13 council, and from others to bring together city  
14 departments to work together to go after this money.  
15 So, that's happened.

16           So, it's really a good way to kind of stimulate  
17 folks that would otherwise not be involved in the  
18 process to really kind of jump in.

19           So, you know, I would encourage that, that  
20 process to continue to move forward.

21           MS. BAROODY: Okay, I think we're done. Thank  
22 you so much, this was a great panel and we have a lot to  
23 think about. Really appreciate all your time to be here  
24 and all of your comments.

25           Thank you, Joel and Jasna.



1 (Applause)

2 MS. BAROODY: So, we'll take probably a three-  
3 minute break and we'll invite up the light-duty panel,  
4 if you would come forward.

5 (Off the record at 2:50 p.m.)

6 (On the record at 2:53 p.m.)

7 MS. BAROODY: Okay, I think we're done with our  
8 break. I know it's going to be touch and sit back down.  
9 We're going to start our Light-Duty EV Fleets  
10 session.

11 If you still need to visit, if you could into  
12 the hallway, that would be fine with me.

13 Well, we're in our session on Light-Duty EV  
14 Fleets and we have a panel of three distinguished  
15 gentlemen. And I'd like to introduce each one to you.

16 On my left is Thomas Piette. Thomas is an  
17 Architect with the State Department of General Services,  
18 also known as DGS.

19 He's currently working in the Energy and  
20 Environmental Section on Sustainability Issues, such as  
21 electric vehicle charging, greenhouse gas emission  
22 reduction, zero net energy buildings, and deployment of  
23 renewable energy sources.

24 And I must say, we're fortunate to have him here  
25 because he's retiring very soon.

1           And we also have with us Kevin Kelley. Kevin is  
2 Vice-President of Business Development for Vision Fleet.  
3 He's an experienced business and project development  
4 professional with significant expertise in project  
5 finance, business model innovation and municipal  
6 markets. As Vision Fleet's VP of Business Development,  
7 he works closely with customers and strategic partners  
8 to solve the economic and operational issues associated  
9 with large-scale, clean vehicle deployments.

10           And then we also have Keith Leech. He serves as  
11 Chief, Fleet Division and Parking Enterprises for  
12 Sacramento County, and President of the Sacramento  
13 Regional Clean Cities Coalition.

14           From 2006 to 2014 he served as the Fleet Manager  
15 for the City of Sacramento, which was recognized as the  
16 number one government green fleet in North America, by  
17 the 100 Best Fleets and the Green Fleet Magazine. And  
18 it was awarded the Energy Vision Leadership Award,  
19 presented by the nationally recognized, not-for-profit  
20 environmental group Energy Vision, for implementing  
21 renewable natural gas to fuel their equipment fleet.

22           Anyway, I'm really delighted to have you all  
23 here today. And we're going to have this panel go in a  
24 similar way as our last panel.

25           So, first of all, I'd just like to have each of

1 you talk a little bit about your work in deploying EV  
2 infrastructure, maybe bring out the highlights of what's  
3 worked and what hasn't worked, what are some of the  
4 barriers that you see. Maybe take about three to five  
5 minutes, each, to talk about your work.

6 MR. PIETTE: This is Tom Piette from DGS. And  
7 DGS is a service provider to other state agencies, such  
8 as EV vehicles, EVSE procurement, sustainability of  
9 projects, as well as electric vehicle charging design.  
10 So, we see a lot of aspects that are involved with this.

11 And the department works closely with the  
12 Governor's Office in the advancement of the Executive  
13 Orders B-1616 and B-1812, both of which affect the  
14 electric vehicles, as well as charging infrastructure.

15 And DGS, right now, has about 40 EVs in its  
16 inventory, both of the monthly rentals, as well as the  
17 daily rentals. And we have a lot of different flavors  
18 of them. We have LEAFs, Ford Focus Electrics, Chevy  
19 Volts, Toyota Rav-4s, as well as a few plug-in Priuses.

20 We maintain 15 of those in our daily rental  
21 fleet, just a few blocks away from here. And we see  
22 those not as just daily rentals, but also a chance to  
23 show them off to people and they can go out and try  
24 different brands, and get them in real life situations  
25 and go out there driving. So, we have a lot going on

1 there.

2           And I have some other comments that I'll hold  
3 for just a bit.

4           MS. BAROODY: Thanks.

5           MR. KELLEY: Yeah, so I'm Kevin Kelley, Vision  
6 Fleets, Vice-President of Business Development.

7           Vision Fleet is a full service, clean fleet  
8 company. We work primarily with public sector entities,  
9 cities, counties, states.

10           And we wrap together a bunch of things necessary  
11 to deploy EVs, plug-in capable vehicles into fleets,  
12 specifically financing technology and then operational  
13 support.

14           When it comes to infrastructure, our approach is  
15 heavily influenced by our total cost of ownership  
16 mindset and our shared savings model. We borrow a  
17 number of concepts that were popularized in the energy  
18 performance contracting and solar spaces.

19           But our agenda is very simple. We aim to keep  
20 fleet costs low, when we're talking about EVs and plug-  
21 in capable vehicles, by increasing utilization and  
22 efficiency.

23           In our minds, achievement of these goals  
24 necessitates a system level approach. So,  
25 infrastructure, in our minds, is really just a part of a

1 fleet network that also includes other elements  
2 required, not only to deploy and charge the vehicles,  
3 but also to operate them efficiently over time.

4           So, things like vehicle telematics, analytics  
5 layers, behavioral cuing capabilities, and on-the-ground  
6 human resources. These are critical and often  
7 overlooked elements which, together, reduce EV fleet  
8 costs.

9           Now, specifically on the infrastructure side,  
10 I'd say that this holistic approach tends to lower costs  
11 because often you'll find that you're able to leverage  
12 other parts of the system.

13           In Indianapolis, for example, where we're  
14 deploying 425 plug-in capable vehicles into the city's  
15 fleet, we've opted, more often than not, to use low-cost  
16 dumb or simple chargers, even existing garage outlets  
17 outfitted with a level 1, if we're talking about a take-  
18 home vehicle.

19           We went this route because, frankly, we can  
20 replicate a lot of the capabilities of more expensive,  
21 Smart chargers by mapping the telematics and vehicle  
22 data that we gather to our known charging locations.

23           So, in Indy we are able to do things like  
24 reimburse drivers of take-home vehicles, if and when  
25 they charge at home, you know, a police detective of

1 someone in the code enforcement department.

2 In effect, this drastically reduces  
3 infrastructure costs because at the end of the day you  
4 just need less infrastructure to support this large  
5 fleet deployment.

6 So, that's a pretty typical example of our  
7 approach which is, again, pretty simple. We remain  
8 flexible when it comes to details on the infrastructure  
9 side, so long as each aspect of infrastructure  
10 deployment serves the broader objectives of lower-end  
11 costs, while increasing efficiency and utilization.

12 MS. BAROODY: Thanks.

13 MR. LEECH: Good afternoon. My name is Keith  
14 Leech. I am actually the third day on the job as the  
15 Chief of Fleet Operations for the County of Sacramento.  
16 But just prior to that I've spent about six years with  
17 the City of Sacramento.

18 The City of Sacramento was amongst the, what I  
19 would consider, to be early, early adopters in  
20 partnership with SMUD, back in the 90s, to put a very  
21 proactive EV policy into place. Which I credit the city  
22 council to have that in place, which it actually led to  
23 many tremendous opportunities for us over the last  
24 several years.

25 The first opportunity was when ChargePoint came

1 to the City of Sacramento and invited us to be part of  
2 nine communities across the country, as part of their  
3 ARRA program, that resulted in over 100 public  
4 accessible level 2 charging infrastructure being placed  
5 in our city garages, that are both free to charge at  
6 this time and free to park at this time.

7           Related to the City's fleet, we sought to find  
8 opportunities, similar to what Tom has said, that the  
9 State's strategy has been to get exposure and get the  
10 vehicles out there for our various city fleet  
11 applications to become comfortable in which applications  
12 are feasible in various city operations.

13           We sought to find early partner funding  
14 opportunities, through Clean Cities, now CalSTART, of  
15 course SMUD, the OEMs to establish a more behind-the-  
16 gate type of level 2 chargers to support the City's EV  
17 Car Share Program, parking enforcement and future  
18 planned plug-in fleet expansion, as well as workplace  
19 charging.

20           The City of Sacramento was the first government  
21 agency in the country to sign on to the U.S. Department  
22 of Energy's Workplace Charging Challenge. And actually,  
23 we probably -- you know, this resulted in Nissan coming  
24 to us and offering our city employees a tremendous value  
25 lease program that they call their Business To Business

1 Program. Where it's essentially you read about the low-  
2 cost leases, and the minimal amount down in the paper,  
3 but essentially they waive that down payment, it's just  
4 a first month's payment. And it's in the neighborhood  
5 of \$250 per month that a city employee, with the right  
6 credit rating, is able to obtain the mid-range Nissan  
7 LEAF.

8           So, we're now looking for opportunities. Well,  
9 you know, I guess that's probably later on. But,  
10 certainly, the opportunity that we saw related to car  
11 share, implementing car share technology to share these  
12 vehicles efficiently, making sure that our usage is  
13 being -- that folks are comfortable in using these  
14 vehicles with a limited range, and that they're aware of  
15 the amount of charge that these vehicles have on them  
16 when they got to get to -- go to their meeting and get  
17 back. So, this has all been very important to us to  
18 have the technology to monitor and manage that.

19           MS. BAROODY: Great, thank you, that's all very  
20 helpful.

21           Now, I'm just wondering, Kevin, has Vision Fleet  
22 received any funding from state, or federal or local  
23 government?

24           MR. KELLEY: No funding directly to the project.  
25 We do take advantage of the Federal Tax Credits that are



1 available for the vehicles and monetize those on behalf  
2 of the --

3 MS. BARODY: Monetize those. Is there any  
4 state rebate, for instance in Indiana?

5 MR. KELLEY: There is no state rebate.

6 MS. BARODY: No state rebate, okay.

7 MR. KELLEY: But, you know, sort of as we look  
8 at various markets across the country, part of what we  
9 offer as a company is the ability to, you know, monetize  
10 those viable tax credits. And then to the extent we can  
11 take advantage of grant funding that's available for,  
12 let's say, the infrastructure piece or if there's, you  
13 know, pilot money available for telematics limits, we'll  
14 look to take advantage of that and pass those along  
15 through our shared savings model.

16 MS. BARODY: So, I'm just going to -- I'm not  
17 going to go by my questions, yet, but I just wanted to  
18 ask you, also, so given that you don't really have  
19 funding, aside the Federal Tax Credit, do you see a need  
20 for state funding in terms of fleet adoption?

21 MR. KELLEY: We really don't. It's helpful,  
22 obviously.

23 MS. BARODY: Right.

24 MR. KELLEY: But we believe that by approaching  
25 the problem holistically and, you know, putting in place

1 all of the different pieces of a deployment that can  
2 help you over time, you know, optimize the operational  
3 savings. So, telematics, Smart route deploying, you  
4 know, behavioral cuing for folks who maybe aren't  
5 plugging in at home, or something like that.

6 We believe that if you do all of those things  
7 and you do them smartly, and manage them effectively,  
8 you can compete with most fleets out there, particularly  
9 in the public sector, just through smart management and  
10 smart deployment of these vehicles.

11 MS. BAROODY: So, I just would like to know from  
12 each one of you what sort of barriers have you  
13 encountered with deployment of infrastructure and, given  
14 those barriers, how might the state be able to assist  
15 with funding.

16 MR. PIETTE: Well, first of all, DGS has  
17 installed five stations at our downtown state garage  
18 here, that is servicing those 15 vehicles that are daily  
19 rentals. And we also have one at our headquarters, as  
20 well. Plus, we have 63 stations in the downtown  
21 Sacramento area that we've installed, that are mainly  
22 for workplace charging, but there are a few that are  
23 used as fleet charging as well for some of our building  
24 tenants.

25 Plus, we're in the process of adding workplace

1 charging stations in about 30 of our buildings  
2 statewide, through an interagency agreement with the  
3 CEC. And some of those will be used for fleet charging,  
4 as well.

5           However, the Governor's Office has asked DGS to  
6 step up to the plate and greatly expand our fleet of  
7 EVs. And one of the problems that we're having, here at  
8 the state garage, is that we have maxed it out as far as  
9 infrastructure is concerned. Not only the building,  
10 itself, but also the SMUD infrastructure that's behind  
11 it. And so that's a real barrier for us, for that  
12 particular location, and so on.

13           But as far as new building design, we don't have  
14 a lot of new buildings under design right now. But for  
15 the very few that we have statewide, because we are  
16 service providers for A&E services for all of the  
17 departments, we are installing both fleet, as well as  
18 workplace charging in all of those, as well.

19           Obviously, some of the barriers, the cost of the  
20 EVSE machine, itself, as well as the infrastructure  
21 improvements. We lack the funding for those.

22           Government, like anything -- I'll speak for all  
23 government, but here in this State, usually our funds  
24 are very closely pigeon-holed and it's very difficult to  
25 transfer funds from one pigeon hole to the next.

1           And so, consequently, it takes us 12 to 18  
2 months to budget for these things, get it through the  
3 budgeting, and then begin the design, and  
4 implementation, and installation. So, it could take  
5 two, three, four years to actually complete a project.  
6 That's really too slow because we are having customers  
7 come with the vehicles already, saying, oh, where do we  
8 plug these things in? Whoops, you know, that doesn't  
9 work very well.

10           And we've also found that in government it's  
11 very fragmented. The vehicles are being ordered by the  
12 fleet managers, but the improvements are through the  
13 facilities managers, and they don't always talk to each  
14 other.

15           So, consequently, there again we have the fleet  
16 managers coming with the cars and saying, where do we  
17 plug them in, and saying, whoops, I guess we don't.  
18 We've have to start on the other project.

19           So, there's lots of coordination that needs to  
20 be done between those two groups, as well as lots and  
21 lots of lead time.

22           Procurement sources, we've handled this one, I  
23 think, fairly well. We're having difficulty actually  
24 procuring the EVSE machines, themselves. DGS now has  
25 procurement contracts that can be used by, I believe,

1 just about every governmental entity within California,  
2 not just state. We have them for both the basic dumb  
3 chargers, as well as the Smart chargers, all the way up  
4 to DC fast charger. As well as the networking and the  
5 maintenance, as well. So, we have a whole package  
6 there.

7 Lack of accessibility standards is a barrier for  
8 us. We've had some departments that have said, hey,  
9 we're going to hold off until we get some standards in  
10 place. 2017 is probably when those are going to be  
11 coming around.

12 And so, we also found out that as our EV fleets  
13 grow, we'd like to institute DC fast charging,  
14 especially at our garage. But we have, you know, a  
15 significant infrastructure limitation there.

16 And also demand charges. Bill Boyce talked  
17 about that and we're working with SMUD in talking about  
18 those demand charges. But here in our downtown loop it  
19 would affect multiple buildings, not just one building.  
20 One charge could significantly cost us tens of thousands  
21 of dollars here, in downtown Sacramento. Wow. So,  
22 we're reluctant to look at DC fast charging for the time  
23 being, until we get that worked out.

24 So, we're looking at potentially solar panels,  
25 coupled with battery storage for some of these limited

1 infrastructure places.

2           And a little kind of a nuisance is common credit  
3 cards. When we loan out a vehicle and they're going on  
4 a longer trip, they're may have to recharge somewhere.  
5 But right now we don't have the credit cards or the RF  
6 ID strips to go out to a public charging someplace, so  
7 people would have to put it on their own personal credit  
8 cards and get reimbursed for that. So, it's kind of a  
9 nuisance, but it is there.

10           MS. BAROODY: Thanks.

11           MR. KELLEY: Yeah, so I'd say that financing and  
12 complexity are the two major issues that we deal with.  
13 At this point in time all Vision Fleets' customers and  
14 its prospective customers are all in the public sector.  
15 So, very few of these entities are awash in cash.

16           You know, they may know exactly what to do or  
17 what they want to do and lots of them, very frankly,  
18 have very ambitious EV, alternative fuel vehicle goals,  
19 but they just simply don't have the capital to execute  
20 on those plans.

21           So, we attack that issue by providing long-term,  
22 low-cost financing for not just the vehicles, but also  
23 the infrastructure and everything else required to  
24 support the deployment.

25           We make the big capital investments up front on

1 the idea that we recoup that investment over time. So,  
2 we see financing as being a continuing issue.

3 Complexity is another thing we deal with and  
4 that exists in a number of different forms. But siting,  
5 and permitting and complicated electricity tariffs are  
6 probably the most problematic for us.

7 When we look to site and permit a location, that  
8 can be very challenging. Because although using the  
9 known route map and the data that we've collected, we  
10 can often identify an optimal site. But as you would  
11 expect, very rarely does this map to property that's  
12 owned by the cities.

13 So, you know, in Indy we're working with the  
14 city, and Indianapolis Power and Light as best we can to  
15 use existing and readily available facilities. But an  
16 environment in which we could expeditiously and  
17 effectively engage with private property owners would  
18 really create a lot of value for everyone involved.

19 Complex tariffs are challenging because they  
20 tend to negate some of the efficiencies we create with  
21 our systems approach. Our ability to leverage the  
22 system is limited if we're dealing with truly complex  
23 time of day rate schedules or demand charge rules.  
24 Those tend to require additional functionalities in the  
25 EVSE, itself, so it limits our ability to serve the

1 fleet effectively with L-1s and L-2s at a lower cost.

2 MR. LEECH: In the City of Sacramento, we  
3 certainly are dealing with the same types of constraints  
4 that both Bill and Tom spoke about, related to  
5 electrical backbone.

6 SMUD was very helpful in surveying our garages,  
7 and our facilities, and looking where we can maximize  
8 the siting of the level 2 charges that we've done.

9 At this point in time, without major investments  
10 for additional DC fast chargers on city facilities, that  
11 without, you know, a high volume of vehicles it really  
12 isn't cost effective.

13 Because for a fleet manager, you look at the  
14 total of cost of ownership that would include the fuel,  
15 the maintenance, the repair, tires, et cetera, and of  
16 course the capital costs.

17 So, anything that the CEC could do to help. You  
18 know, on a similar program, I think recently there was a  
19 program that was offered through propane vehicle OEMs,  
20 and also compressed natural gas vehicle OEMs, where they  
21 actually provided vouchers to cover fuel, if there could  
22 be something similar put in place that would encourage,  
23 you know, our employees or not even just government  
24 employees, but private sector employees to have some  
25 level of reimbursement for EV charging, and the electric



1 costs so they're encouraged to charge at home. So, the  
2 employer, whether it be public or private, would not  
3 have to make the major investment in these electrical  
4 upgrades.

5           You know, as far as DC fast charging, we seek  
6 out to partner with SMUD. We're siting one of the DC  
7 fast chargers at city property downtown, next to the  
8 downtown rail yards. But even that is really a backup  
9 plan.

10           So, you know, it's to give people the peace of  
11 mind. And I missed the panel earlier, I'm sure this was  
12 all spoken about. But it's really for the folks that  
13 can't charge at home. We would like to encourage our  
14 employees to charge at home. And if there's any way we  
15 could take a look at the 140 or 150 on-call public  
16 safety type, generic sedan vehicles that are running 15  
17 to 20 thousand miles per year, and looking at that total  
18 cost of ownership, if there's a way we could come up  
19 with a reimbursement mechanism that wasn't overly  
20 complicated for these employees, to encourage them to  
21 charge at home, I think we would have much better  
22 acceptance of an EV, or at least a plug-in hybrid.

23           And, of course, that definitely could open up a  
24 huge market for the city fleet.

25           MS. BAROODY: Great, thank you.

1           So, in terms of CEC funding, what would you  
2 ideally like to see in terms of EV fleets? What would  
3 be, if you were to open up a PON and there it is, what  
4 would you like? What would be helpful.

5           MR. LEECH: Do you want to go first, Tom?

6           MS. BAROODY: Yeah, go ahead.

7           MS. BISCHHEL: Yeah, I'll go first.

8           MR. LEECH: You need a lot of money at the  
9 state.

10          MR. PIETTE: Well, first of all, funding studies  
11 of the infrastructure, I've heard infrastructure  
12 mentioned many, many times here today. It seems like a  
13 can of worms when we're going in and retrofitting a  
14 facility. We're running into all kinds of problems.  
15 And we're looking at 30 different buildings across the  
16 state. And it's not just here in Sacramento, it's  
17 everywhere.

18          And the utilities have been good partners in  
19 this regard, but they can't design it for us. They can  
20 do some analysis, but we need to really get in there and  
21 design it to figure out what needs to be done, to see if  
22 it's even feasible to some degree. So, I'd like to see  
23 some of that.

24          And I have to think that significant fleets are  
25 few and far between. There can't be that many of them

1 here in California.

2 Obviously, design and installation of the  
3 funding for that, we could certainly use that. And many  
4 departments have come to us and say, hey, where's the  
5 funding for this? We're mandated to buy the cars, but  
6 there's nothing to back up the EVSE.

7 And also demand charges. I'm very glad to hear  
8 that SMUD is having a tariff that looks are reducing or  
9 eliminating demand charges. That is a significant  
10 problem for us when we attach it to a building, itself.  
11 It becomes a huge deterrent for us.

12 MR. LEECH: I'd like to reiterate what the  
13 gentleman said earlier about talking and accepting  
14 funding or providing funding for level 1 charging. I  
15 think that's a huge opportunity for our city fleet,  
16 where we have a lot of electrical capacity for level 1  
17 chargers, for return-to-base vehicles that sit  
18 overnight. They can certainly charge overnight and  
19 they'll have plenty of range the next day for what they  
20 need to do in the field, within the City of Sacramento.

21 I also believe that a comprehensive look at a  
22 fleet that would include a car share solution, the  
23 technology that's associated with telematics, that helps  
24 a fleet manager, you know, the efficiencies and  
25 assigning the right type of vehicle. Similar to what

1 this gentleman was talking about earlier, that's being  
2 done in Indianapolis.

3           Because that's what it really comes down to, you  
4 want to assign -- you know, a fleet manager wants to  
5 assign a vehicle that the operator is going to want to  
6 drive and is not going to complain about over its  
7 lifetime.

8           So, you know, and that can be done very well  
9 with GPS telematics. GPS telematics can also dispel  
10 many of the myths and the folks that say it will never  
11 work for me. So, you know, it's easy to pick out where  
12 it will work based upon past driving behavior.

13           So, any help we could get in that area, as far  
14 as the capital costs, talking about establishing a way  
15 to reimburse employees, whether it be public or private,  
16 as part of the total cost of ownership, essentially for  
17 the fuel. And encouraging them to charge at home so we  
18 don't have to invest more infrastructure.

19           MR. KELLEY: Yeah, I'd follow on to what Keith  
20 was saying. We think that, you know, state support  
21 could be really helpful for fleets who are -- who have  
22 grand ambitious or, you know, a lot of ideas, but not  
23 necessarily the bandwidth to do the detailed, you know,  
24 duty cycle analysis or to deploy a telematics pilot to  
25 really understand where the opportunities exist.

1           So, you know, any support that the state could  
2 give fleets to engage in those sorts of efforts would be  
3 welcome. You know, we stand ready to help fleets do  
4 those sorts of things but, you know, we can't serve  
5 everyone.

6           On the actual infrastructure side, I think we  
7 would -- we believe that anything that incentivizes low-  
8 cost installation, some of the level 1 support, really  
9 optimal site selection and then utilization would be  
10 good.

11           So, you know, I'm talking effectively about  
12 incentives for dollars per kilowatt hour charge,  
13 something more like the PTC in the wind industry, than  
14 the investment tax credit in the solar industry.

15           MR. LEECH: And just to add on one more item,  
16 certainly DC fast chargers that could be shared between  
17 public agencies. For instance, we described the City of  
18 Sacramento as one large corporate campus of government  
19 workers. And so, if the city, or the county, or the  
20 state could find, you know, one really good, accessible  
21 piece of land where we could get the electrical backbone  
22 that could serve multiple agencies, that would be very  
23 helpful.

24           MS. BAROODY: Great. So, finally, what are some  
25 technological or innovative advancements that should be

1 considered with EV fleet charging. I know there's  
2 mentioned a few, but is there something on the horizon  
3 that you see coming or that you anticipate?

4 MR. PIETTE: Well, I think the solar battery  
5 combinations that are stand-alone for these  
6 infrastructure places, where we really can't get the  
7 infrastructure or it's going to be very costly, we  
8 should take a look at that.

9 It can also help us with load shaping, as well,  
10 for the buildings. And I think it can solve a lot of  
11 problems there.

12 And also with demand charges, it can maybe  
13 soften that. We can be charging those batteries either  
14 through solar or through the grid at off hours, and help  
15 with that.

16 Vehicle-to-grid technology, V-to-G, that's  
17 certainly something that is applicable to large fleets,  
18 and so I think we should definitely look at that.

19 MR. LEECH: The City of Sacramento has been  
20 approached by a company, I don't recall the name, but  
21 it's intriguing that they are using used Nissan LEAF  
22 batteries, essentially, and they want to basically  
23 provide a valet charging service. So, they come to you.  
24 And so, I think that's an awesome opportunity. Not only  
25 something to rely on, on a daily basis, but something to

1 have there as that backup peace of mind for the folks  
2 that, you know, one day they may have to go to their  
3 child's doctors or a school appointment after work, and  
4 add a little more range onto their daily routine.

5 MR. KELLEY: Yeah, so we think that the  
6 combination of infrastructure and telematics data is  
7 going to be very powerful, for all the reasons we've  
8 talked about before.

9 Along those same lines we see, you know, really  
10 light weight car sharing tech as being something that's  
11 going to be important to fleets. Because, at the end of  
12 the day, it's all about utilization.

13 Similarly, software layers on top of the  
14 chargers, things like that, that we can import or  
15 telematics data or our analytics layer two. We're  
16 seeing an increasing amount of those and it's all pretty  
17 good.

18 And then at the vehicle level, bidirectional and  
19 controlled charging on the vehicles, themselves, should  
20 have pretty wide-ranging implications for us, and that  
21 it will drive down the costs of the charging stations  
22 and also, you know, enable us to host a lot of vehicles  
23 at a single EVSE location.

24 And then, you know, following on some of Tom's  
25 comments about dealing with issues at the transformer

1 level, you know, managing the demand pulls there so  
2 we're not incurring huge charges.

3 MR. LEECH: And just one more thing, I didn't  
4 really talk about earlier, but anything we can do to  
5 facilitate the wide acceptance in public agencies for  
6 the one-pay leasing strategy, that's what we've used in  
7 the city to take advantage of those incentives, the  
8 passing through the federal incentives.

9 You know, it's very difficult to overcome  
10 regulatory legal obstacles for many local governments  
11 and states. And, you know, if we could just get some  
12 assistance. It may require legislation to facilitate  
13 that.

14 But essentially the city, with the 25 or so  
15 plug-in vehicles that we've acquired over the last two  
16 or three years, we haven't bought one. It's all been  
17 through one-pay lease competitive bids, and amortized  
18 out for a 36,000-mile, three-year lease. It works out  
19 to about \$8.00 to \$10.00 a day. And that's a heck of a  
20 deal to provide basic transportation to our employees.

21 MS. BARODY: Great. Well, we're approaching  
22 the time for questions and I was just wanting to see if  
23 anybody here in the room has a question, or several,  
24 maybe some on the WebEx. Just raise your hand and --

25 Mark Melena from NREL is here.



1 MR. MELENA: Thank you.

2 MS. BAROODY: Hi, Mark.

3 MR. MELENA: Can you hear me?

4 I think it's really interesting that there's a  
5 discussion of level 1 versus level 2 and sort of optimal  
6 sweet spots for different fleets. But I'm wondering if  
7 you could talk about maybe some ratios or numbers, just  
8 within your purview of vehicle fleets. If you were to  
9 answer all those questions optimally, what would you see  
10 as the split between level 1 and level 2?

11 MR. PIETTE: I'll take a shot at that. First, I  
12 think it depends on how the fleets are used. If they're  
13 gone all day and are charging overnight, level 1's would  
14 be working fine. But you'd have to have a one-to-one  
15 ratio because nobody's there to change the ports at the  
16 evenings.

17 If you're cycling the cars through, like we do  
18 on our daily rentals, DC fast charging may make more  
19 sense so that you can perk up the cars and send them out  
20 again, pretty quickly.

21 Or level 2's, but there again it would probably  
22 be on the ratio of maybe one port per two or three cars.

23 MR. KELLEY: Yeah, I think that ratio sounds  
24 about right to us. It's a tough question to answer just  
25 because fleets are so different. You know, the fleet

1 we're working with in Indianapolis, there are a lot of  
2 take-home vehicles. So, we're able to lean heavily on  
3 L-1 overnight, when folks are taking those vehicles  
4 home.

5 In other fleets, where they don't have so many  
6 take-home vehicles, we're going to need to deploy more  
7 L-2 chargers to handle all of that during the day.

8 MR. LEECH: And I would just say that, you know,  
9 from a city's perspective, we've maxed out in what we  
10 can do without major electrical backbone upgrades that  
11 costs tens of thousands or hundreds of thousands of  
12 dollars in many cases.

13 And so, you know, I think I heard some numbers  
14 batted around earlier about, you know, a level 2 charger  
15 on average, and Bill correct me, you probably shared  
16 this earlier. But, you know, I think it ended up being  
17 about \$20,000, maybe, per charger with installation and  
18 upgrade costs on average, is that -- yeah, so you can do  
19 a whole lot of level 1's if you have existing electrical  
20 capacity and sufficient dedicated circuits, and if you  
21 have vehicles that are return-to-base fleets, in a  
22 corporation yard behind the gate, you can probably get  
23 15 or 20, maybe, for what one level 2 charge might cost  
24 if you have to do a whole lot of electrical upgrades.

25 MS. BARODY: Anybody else here in the room,

1 questions? Anybody else want to comment on any of their  
2 own fleets that they have?

3 Do we have anybody here who operates fleets? Is  
4 anybody else here?

5 MR. SCHORSKE: I've just got a follow up.

6 THE WITNESS: Oh, yeah, Richard.

7 MR. SCHORSKE: For the division fleet folks on  
8 the level 1. Are you looking at funding any level 1  
9 infrastructure in your model?

10 MR. KELLEY: Yes, we fund quite a bit of level  
11 1, you know, providing the equipment necessary for folks  
12 to take advantage their chargers at home, along with the  
13 vehicles. So that's certainly -- you know, we consider  
14 part of our infrastructure deployment a lot of level 1.  
15 You know, and some level 2. But again, that will vary  
16 when we look at different fleets. I mean some fleets,  
17 you know, you might not have a lot of opportunities for  
18 level 1 and it's primarily level 2 and 3.

19 MS. BARODY: Let's see, anybody else in the  
20 room? Ah-ha, Lloyd.

21 MR. TRAN: Lloyd Tran. I'd like to ask, the  
22 police, about the question. You mentioned earlier about  
23 the viability of V-to-G. Do you think there's a role or  
24 their might be a need for your own fleet to participate  
25 in a demonstration to study viability of a possibility

1 like we have -- so when you have 10 or 20 electric  
2 vehicles, you use each of those EVs, each of them have,  
3 for example 10 to 40 kilowatt hours from the Nissan.  
4 Ten of them you have 240 kilowatt-hour metric on there.  
5 Do you see the need to (inaudible) -- from the EVs back  
6 to the building in the time of needs, like most  
7 situation, or a disaster, that the grid may be disrupted  
8 and the need for the vehicle power from these batteries  
9 on wheels can help your building. Do you think that's a  
10 viability at all?

11 MR. PIETTE: Well, I'll respond for DGS. I  
12 think there is a role for V-to-G, especially for fleets  
13 and especially for state vehicles. We tend to be sort  
14 of the proving ground, you might say, in some cases.  
15 And we also have an executive order to participate in  
16 demand response with our buildings. And we can go  
17 beyond demand response and actually feed power back into  
18 the grid, if possible. We don't have an executive  
19 order, necessarily, to do V-to-G, but I think it's in  
20 the keeping with what the Governor has asked us to do.

21 MR. LEECH: I can't really speak to V-to-G.  
22 But, you know, we're very interested in exploring the  
23 potential related to these vehicles. You know, getting  
24 us off of relying on generators in the field, helping us  
25 power the emergency radio communication systems in our

1 emergency vehicles, bucket trucks. We're working with  
2 various OEMs and seeking to participate in demonstration  
3 projects. But that's really not on the light-duty side.

4 Certainly, anything we can do to move to a  
5 hybrid electric where a police officer, in the field,  
6 doesn't have to keep their engine running to run the air  
7 conditioner, and to do their paperwork in the field,  
8 that's a step in the right direction.

9 MS. BAROODY: All right, any other questions?

10 How about WebEx, do we have anybody on WebEx?

11 MR. LERMAN: Yeah, so just one quick question  
12 from Eileen Grogan. She's asking, "What would be the  
13 best way for a new innovative company to demonstrate or  
14 present an EV technology pilot to the Energy  
15 Commission"?

16 MS. BAROODY: Well, we would love to have her  
17 come in and talk to us. We would set up an appointment  
18 and have a chat.

19 Anybody else in the room? On the WebEx? No,  
20 we're running out of steam.

21 Okay. Well, I think that does it. Is there  
22 anything else you want to say, anybody else have last-  
23 minute comments or anything?

24 Well, I thank you so much for your time and your  
25 very useful comments today. Thank you.

1 (Applause)

2 MS. BAROODY: Give us a minute or two and we'll  
3 be into our next session.

4 Excuse me. Okay, so the meeting's not quite  
5 over, yet.

6 (Off-record conversation)

7 MS. BAROODY: Okay, we're going to gather one  
8 more time for our last, very short session on Public  
9 Charging and Other Venues.

10 If I could have Richard Schorske come up?

11 (Pause)

12 MS. BAROODY: Okay, we have a few more minutes  
13 of our workshop, if everybody could have a seat, or if  
14 people could maybe meet in the hallway to finish their  
15 conversations.

16 So, this session is kind of a catchall. It's  
17 called Public Charging and Other Venues.

18 So, we've talked about corridor charging, we've  
19 talked about multi-unit, workplace, fleets, so this is  
20 kind of the other categories of charging.

21 And we don't really have a panel.

22 Okay, they're saying I have to get mean. Okay,  
23 we are coming to order for the last portion of our  
24 workshop. I think this mic works better.

25 And we actually do not have a panel, but I have

1 asked Richard Schorske to assist me here. And we just  
2 have a few questions and we really want to put it out to  
3 you folks that are left in the audience, and anybody  
4 else on WebEx.

5           You know, we talk about public venues, you know,  
6 it covers a lot of things. So, we've got parks, and  
7 libraries, and hospitals, and schools, and civic  
8 centers, all kinds of places. And we have used a lot of  
9 our funding for those types of venues.

10           So, I want to get a sense for, you know, what do  
11 we want to do with funding in our next solicitation?  
12 How do we want to fund those venues?

13           In our last solicitation we invited public  
14 entities to apply for large -- you know, I thought large  
15 pots of money, of half-a-million dollars or so, and they  
16 were coordinated with local PEV planning regions. And  
17 that was actually quite successful, we got a pretty good  
18 uptake on that.

19           So, is this something that we want to continue  
20 to do? So, I'm going to put the question out to you.  
21 And maybe, Richard, do you want to say a few words about  
22 that, about the idea of --

23           MR. SCHORSKE: Well, I'll just mention, you  
24 know, some of the ideas that have popped up in the last  
25 few months, that I know are considered sort of potential

1 gap areas. And one of them is congestion zones,  
2 generally speaking, across the state. Folks are well  
3 aware of how some localities are just really  
4 outstripping supply.

5 Karen put up a slide on the Bay Area situation  
6 that's getting worse, rather than better, in terms of  
7 the attachment rate of the number of PEVs to EVSE.

8 And there's also, with respect to corridor and  
9 DC fast charging, lines really make the whole point of  
10 DC fast charging problematic, to say the least. So,  
11 anywhere where we might want to do like super-plazas and  
12 have multiple DCFCs might be another area.

13 So, those are just two ideas that I know have  
14 been circulated in the past.

15 But I think things along those lines that are  
16 maybe new, in terms of an approach, would be welcome  
17 here.

18 MS. BAROODY: Also just considering, you  
19 mentioned areas of congestion. We need to consider, you  
20 know, funding expansion at those areas. But also in  
21 areas of the state where there's been very little  
22 infrastructure deployed. For instance, the San Joaquin  
23 Valley, there's not much PEV adoption there. We don't  
24 have congestion problems but, yet, we want to deploy  
25 infrastructure. So, if we build it, then maybe they'll



1 come. Although, it's not a definite thing that's going  
2 to happen.

3 But we would like input from any of you. I'm  
4 looking at Karen here, in the audience, who might want  
5 to say a few words about this, or Lloyd. Is that  
6 Dexter? Dexter, yes. Dexter's here.

7 Anyway, we have a roving mic, if you would like  
8 to comment on this and what the Energy Commission can do  
9 to support various types of public charging, that would  
10 be great.

11 MS. SCHKOLNICK: Thanks, Leslie. I'm Karen  
12 Schkolnick, with the Bay Area Air Quality Management  
13 District.

14 Just one quick thought, maybe a couple of  
15 related thoughts. One thing we really struggle with is  
16 this issue of how to get at the funds and how to -- from  
17 our perspective, we are putting out the funds, we're  
18 basically buying clean air. That's how we think of it.  
19 And not just trying to get out chargers and make sure  
20 that lots of people have them, we're literally trying to  
21 clean the air.

22 And for us, it really comes down to how much  
23 money do we have and how much clean air can we get? So,  
24 it's just really important that, from a public point of  
25 view, that there's also a return on investment.

1           In other words we're trying to A, get the  
2 dollars out quickly, so we're trying to deploy them in  
3 areas that there's going to be uptake. And we're also  
4 trying to do it in a cost-effective -- and I don't  
5 recall who it was, earlier on the panel, was talking  
6 about certain DC fast charging, you could put it in, or  
7 you could put in -- I think it was just the last panel.  
8 It's been referred to a few times. You could put out  
9 one DC faster charger, or one level 2 charger, or many  
10 level 1 chargers.

11           So, we're starting to kind of look at that, how  
12 can we do more with the fund we have.

13           And then, of course, the third part of it is  
14 also trying to look at the equity issue and make sure  
15 that we're putting the funds where the air quality is  
16 the worst.

17           But what we're also seeing is the reality is  
18 we're so at the beginning of this process. We're really  
19 just -- you know, when we look at where we need to get  
20 in the Bay Area, of 250,000 vehicles and we're just not  
21 even -- you know, we're just getting started and we have  
22 to do this quickly.

23           So the reality is for us, how can we do this  
24 quickly and cost-effectively.

25           And I do believe that if we can create the

1 market, and bring the prices down, it will make it  
2 easier for everyone to be able to participate in this  
3 process.

4           So, again, those are how we're thinking of it is  
5 we need to be able to do projects that, again, can be  
6 done cost-effectively and quickly.

7           And one of the challenges somebody else  
8 mentioned, and I'll just touch on that before I pass  
9 this on, the nature of the solicitations are such that  
10 you already have to know exactly who's involved in it.  
11 And that aspect makes it very difficult to do good  
12 projects because there could be a lot of possibility if  
13 you could then do an RFP, or if you could have folks  
14 apply who have cost-effective ideas.

15           But if you already have to have your partners  
16 prequalified and ready to go, when the solicitation  
17 comes out, it really limits which projects are feasible.  
18 So, that's something to also consider.

19           We've struggled with that and I know the Energy  
20 Commission has, too.

21           So, anyway, thank you for opening this up.

22           MS. BAROODY: Thank you, Karen. Yeah, thanks,  
23 that seems like it's been a common theme throughout the  
24 day, just having to have all your ducks in a row before  
25 you get the money, and that's not always easy to do.

1 So, I appreciate that.

2 Let's see, right behind, you Jasna.

3 MS. TOMIC: Yeah, I was just going to connect to  
4 Karen's comment. That is true, when we were reaching  
5 out to workplaces the last time around, they have very  
6 different cycles in terms of responding and able to  
7 incorporate it into their cycles.

8 MS. BARODY: Yeah.

9 MS. TOMIC: So telling them, oh, this is due in  
10 six weeks, you know, now way. So, just was not possible  
11 to have them engaged in their processes of getting it to  
12 their boards, or whoever.

13 MS. BARODY: Sure.

14 Right here.

15 MS. HOFF: Hi, Sharon Hoff, San Francisco Clean  
16 Cities and Department of the Environment. I would say  
17 one thing that I've noticed, as a department we probably  
18 have more resources than a lot of the other  
19 municipalities, but it's the same thing in terms of  
20 putting -- having resources to put together the grants I  
21 think almost automatically excludes a lot of more  
22 marginalized communities and smaller communities that  
23 don't have the staff time and funding to put together  
24 those applications.

25 So, I think that's -- you know, I'm not sure

1 what the solution to that would be but, you know,  
2 assistance with grant preparation or something like that  
3 might be able to diversify the solutions that were  
4 coming in, into applying some of these communities that  
5 haven't been served, yet.

6 MS. BAROODY: Okay, thanks.

7 MR. BOYCE: Bill Boyce, with SMUD. One of the  
8 things I'll throw out there, I think under consideration  
9 for public type situations, I'm starting to hear a  
10 little bit of rumors about the free puppy syndrome  
11 catching up. And the fact that hardware got installed  
12 in some of the first waves, it's off warranty, and how  
13 are we going to get it repaired and get it operational  
14 again?

15 And right now, almost all of the solicitations  
16 are for new construction. But, you know, helping to  
17 keep some of this stuff that's already out there alive,  
18 some of the public agencies are desperately, probably in  
19 need of help and budget to do that.

20 So, to the extent you can think about that or,  
21 you know, how are we going to continue the O&M on these  
22 things going forward it's, you know, an issue that will  
23 start to grow as more and more of that stuff comes off  
24 warranty.

25 MS. BAROODY: Great point. Thank you, Bill.

1           MR. MIKE HARRIGAN: Hi, Mike Harrigan, with the  
2 Bay Area Climate Collaborative. Kind of leveraging what  
3 Karen and what Sharon said, but from a different point  
4 of view. And that is that in the last solicitation, PON  
5 606, I believe it was, the limit was -- for category one  
6 was \$500,000. We found that to be kind of a limiting  
7 factor. Had much more response and actually had to turn  
8 some communities away on that.

9           So, having perhaps larger grant potential, along  
10 with more time to respond would be great.

11           MS. BARODY: And what do you think about public  
12 entities being the eligible applicants?

13           MR. MIKE HARRIGAN: I think it's good. I mean,  
14 I have no problem with that. I mean, again, we're a  
15 nonprofit so we responded in category one, which we were  
16 allowed to do.

17           MS. BARODY: Right.

18           MR. MIKE HARRIGAN: But the \$500,000 cap we  
19 found to be somewhat limiting. What we actually did was  
20 we aggregated several communities together and helped  
21 those that did not have resources, themselves, to  
22 respond. And I think that's a useful way of approaching  
23 that problem.

24           MS. BARODY: Well, what would you -- what would  
25 you choose as a cap if you could choose?

1           MR. MIKE HARRIGAN: I would say a million should  
2 be sort of the bottom.

3           MS. BAROODY: A million should be the bottom.

4           MR. MIKE HARRIGAN: For that type, for that  
5 particular type of -- and, you know, maybe even a little  
6 bit more.

7           MS. BAROODY: Okay.

8           MR. MIKE HARRIGAN: Well, Richard may have some  
9 ideas on this, too.

10          MR. SCHORSKE: I second that. I think the  
11 administrative overhead in responding, especially  
12 quickly, and especially with multiple entities is very  
13 substantial, and the more you can spread out that cost,  
14 the more efficient the whole process becomes, and the  
15 more diverse the communities are, too. There's  
16 definitely a relationship there, as well.

17          MS. BAROODY: Okay. Dexter?

18          MR. TURNER: Hi, Dexter Turner from OpConnect.  
19 One thing I wanted to bring up is with public charging  
20 being able to accept credit cards at the charging  
21 station. So, I would even push that, you know, any  
22 charging stations that are purchased or bought online  
23 with the funding be required to have credit card  
24 readers.

25                 And that opens you up for a couple things.

1 Number one, there was some discussion earlier about  
2 networking or operability, and the fact that there's  
3 different networks. And a lot of those problems go away  
4 if you just accept credit cards at the charging  
5 stations, right.

6 The other thing it helps with is if you can also  
7 accept fleet fueling cards at the charging station.  
8 Now, fleet vehicles can also use these public charging  
9 stations when they're away from base.

10 MS. BAROODY: Thanks.

11 Joel -- I'm sorry -- yeah, Joel, go ahead.

12 MR. POINTON: Just a follow-up comment on the  
13 credit card. The technology is moving rather fast and  
14 this is going to become your transaction point of the  
15 future. So, we may want to look a little bit down the  
16 road.

17 Granted, today's transaction is a credit card,  
18 but in three years I don't know that that will be true.

19 MR. TRAN: Lloyd Tran, you asked me for counsel.  
20 Actually, we discussed today, everybody pretty agree  
21 upon the fact that there is a challenge on the business  
22 model of DC fast charger.

23 Because like Karen mentioned, and the people  
24 mentioned, the cost of DC fast charger is very  
25 substantial and the installation cost, the



1 infrastructure cost is so severely high. And that makes  
2 a business model very difficult to sustain the DC fast  
3 charge deployment unless we continue to depend on free  
4 money from the public support, which is nice.

5           However, I would like to ask for your consider  
6 in the future there might be the need for the CEC to  
7 support, to fund any kind of development to make a DC  
8 fast charger more cheaper and better than what today.  
9 Because of the situation with the ECotality, who  
10 received \$250 million for a certain project, the cost is  
11 very high and everybody hurry to go along with the very  
12 high margin, high things, which is okay.

13           However, it is a barrier for the development and  
14 the deployment of the infrastructure and the DC fast  
15 charger.

16           So, I've got two suggestions. Number one is of  
17 a possibility of funding for the development of a new DC  
18 fast charge, which is smaller, compact, light-weight,  
19 and use less energy, also cheaper.

20           I mentioned earlier, when I talk with a number  
21 of hotel chains, they're actually willing to buy the DC  
22 fast charger, themselves, because of -- but because the  
23 price is so high, they actually shy away from it.

24           When we're able to install one DC fast charger,  
25 they ask for a few more to do the same.

1           So, the critical challenge is a low-cost DC fast  
2 Charger, pricing about \$10,000.

3           I know the Department of US DOE spent some time,  
4 they have a solicitation for funding like lower-cost  
5 solar systems a few years back. And thanks to that  
6 support, nowadays you see the cost of the solar panel  
7 much, much lower because a lot of development going on.  
8 So, that's a critical challenge. That's one.

9           Second suggestion, would suggest you look upon  
10 the idea that might be the government, instead of giving  
11 away free money, how about financing? How about a loan?

12           MS. BAROODY: And we are working with -- we're  
13 working with the Treasurer's Office on that.

14           MR. TRAN: Yeah, and that maybe save the  
15 taxpayer money, but at the same time to encourage  
16 private sectors to do something that makes sense to this  
17 model, that having a return on investment and  
18 (inaudible) --

19           MS. BAROODY: Good, thank you.

20           MR. TRAN: Thank you very much.

21           MS. BAROODY: Great thanks, Lloyd.

22           Let's see, check time here. Oh, we have to save  
23 time for public comment. Maybe that's what we're doing  
24 right now.

25           Let's see, officially, do we have any blue cards

1 there? No, no blue cards. Oh, we have a blue card.  
2 Let's let the blue card person go first, since they're  
3 official.

4 And anybody on the WebEx that's public?

5 Okay, so please introduce yourself.

6 MR. RENAUD: Okay, thank you. My name's Raul  
7 Renaud and I work here, at the Energy Commission, but  
8 I'm speaking for my personal self, not my role as an  
9 attorney here.

10 I'm an EV supporter, consumer, and I'm kind of  
11 speaking in that role. We have two of them in my  
12 family. I guess the two of them have accumulated about  
13 42,000 miles, so we have a fair amount of real world  
14 experience with these things.

15 And since this is, as I understand it, this  
16 workshop is to throw around ideas of where is the best,  
17 what is the best use of public funds, listening to  
18 everything today I'm going to support corridor charging,  
19 specifically fast charging.

20 And the main reason for that is that listening  
21 to the various people discuss it, one thing that I heard  
22 over and over is that the business case is weak, and I  
23 can understand that that's true. You've got very  
24 expensive equipment for, basically, what's a fungible  
25 commodity. And, you know, you've got all the siting

1 issues and all that stuff. So, business case is weak.

2           The other is that the state has a very lofty  
3 goal of a million plus EVs on the road. And I think in  
4 order to do that, to accomplish that, you're going to  
5 have to convince people that driving an EV is just about  
6 as convenient and is more economical than driving their  
7 gasoline car.

8           If you tell people, okay, your EV can go 80  
9 miles, to them, they're thinking, okay, that means I can  
10 go 40 miles away from home and back. And, you know, 40  
11 miles just doesn't sound like a whole lot, except in  
12 terms of the commute. And certainly in terms of commute  
13 that, for most people, is great.

14           The other day -- here's an example. The other  
15 day, I like to see how far I can go in the EV, so I set  
16 out from Davis to Auburn, knowing that I couldn't do  
17 that and back on a single charge.

18           MS. BAROODY: Never tried that.

19           (Laughter)

20           MR. RENAUD: Well, so I looked up where could I  
21 recharge the car, and I found that in Rocklin there is a  
22 brand-new, NRG Freedom Station there. And so, I pulled  
23 in there, and I plugged in, and I'm charging up. And  
24 this always happens, someone wandered over who was just  
25 interested to talk about the car, and the whole thing.

**CALIFORNIA REPORTING, LLC**

52 Longwood Drive, San Rafael, California 94901 (415) 457-4417

1           And he said, so what's that costing you to  
2 charge that car right now? And I looked at him and I  
3 said, well, I guess it's about 9 bucks. Because it's  
4 \$4.95 to plug it in and then 20 cents a minute.

5           Oh, okay, and how far can you go on that? And I  
6 said, well, probably 65, 70 miles. And, you know, right  
7 away you could see the wheels turning, and he's  
8 thinking, well, heck I could drive my Suburban on  
9 gasoline for less than that. And he's right, you know,  
10 that's almost \$10 for 70 miles. That's not good  
11 economics.

12           So, one of the roles of government, as I see it,  
13 is to do the things that business can't or won't do. To  
14 me, the DC fast charging in corridors is such a thing.  
15 The economics of it aren't going to work out, if you  
16 want to be able to give it to people in a way that's  
17 going to maximize their convenience and keep their costs  
18 low. Not free, but low.

19           So, I would like to suggest that that would be a  
20 very good place to expend those public funds.

21           As far as locations, what occurred to me, and I  
22 was very glad to see Jeremy here, from Caltrans today,  
23 is I looked it up, we've got something like -- let me  
24 see, I wrote it down here. Close to 100 rest stops  
25 alongside our freeways and we've got around 300 park-

1 and-ride lots, which are mostly by the freeways. And  
2 those strike me as places that ought to be explored for  
3 installation of these fast charging plazas. They've  
4 already got electricity for the most part. They've got  
5 lighting. They've got, you know, bathrooms. I mean,  
6 they're generally good places. So, I would like to  
7 encourage looking at that.

8           And my final thing, and this is something I  
9 haven't heard anybody talk about, is there was some  
10 concern about, perhaps, are we going to over-build, put  
11 up too much fast charging and then we won't need it.

12           One thing to think about is, as these LEAFs and  
13 whatever get older, until the battery's replaced, they  
14 just need to be recharged more often. They can go --  
15 you know, instead of 80 miles, they can go 50. So,  
16 having extra fast chargers around I don't think is going  
17 to be a problem, as long as these cars are aging.

18           In addition, I think these cars as they age, and  
19 they become cheaper and cheaper to purchase, are going  
20 to start finding their way into the used car market in  
21 lower income areas. And I'm thinking of the San Joaquin  
22 Valley, in particular.

23           So, I think building up charging infrastructure  
24 there, in advance of the arrival of that wave of used  
25 EVs would be a good thing.

1 MS. BAROODY: Great.

2 MRE. RENAUD: Thank you.

3 MS. BAROODY: Thank you very much for your  
4 comments.

5 Let's see, we have about four minutes left.

6 Yes, go ahead. Go ahead.

7 MR. HALL: Gain, Guy Hall from Sacramento  
8 Electric Vehicles. Over the last couple years we've  
9 been working with a number of Fortune 1000 firms to  
10 educate the workforce about EVs and try to encourage  
11 adoption by employees and staff for EVs.

12 And, you know, the initial results are really  
13 very disappointing. I mean, we put on a big event, show  
14 a lot of cars, share experiences. And the next week  
15 call them up and say, well, are you going to buy one.

16 And no interest. You know, phone calls aren't  
17 getting returned.

18 But a year later, a year later somebody will  
19 talk to those same, the operations manager, the folks at  
20 the leadership positions at those companies, and they're  
21 suddenly stressed because all their employees, over the  
22 year they go out and buy electric cars, and now they're  
23 having to look at, figure out what are they going to do  
24 as their employees are requesting charging facilities,  
25 how are they going to satisfy that need? What are they

1 going to do to fulfill that?

2           And they're doing that in a way that they're not  
3 well-equipped to handle. They don't have the experience  
4 in it, what's the difference between what's a level 1  
5 and level 2? What's the difference between a fast  
6 charger and a quick charger? You know, they're asking  
7 those kind of questions.

8           And one manager, oh, they're looking at several  
9 hundred charging workplaces across the state. And he  
10 said, well, we think we'll just put in a bunch of quick  
11 chargers and that will solve everybody's needs. He  
12 didn't know that most, maybe the cars don't even have  
13 the ability to do the quick charging.

14           And what they've done is they've listened to  
15 several vendors, because the vendors come to them, and  
16 each vendor has their model, and their approach. It  
17 works very well under those scenarios, but they don't  
18 see the breadth. Well, they see several, then they're  
19 trying to reconcile this.

20           So, what we're finding is a gap. Not just a gap  
21 in the employees and their education about EVs, but then  
22 for the people in the operations, they're having to look  
23 at infrastructure. How, what is it that they need to do  
24 to determine the right fit for their business.

25           And we haven't seen -- they're not real keen on



1 paying for that because all the vendors are offering to  
2 do it for free.

3 MS. BAROODY: Sure.

4 MR. HALL: So, we're trying to see, as these  
5 grants come out, for doing infrastructure at workplaces  
6 how is there a component of that, that can be used to  
7 provide guidance and advice, and education to the  
8 operations folks and the people that are looking at  
9 moving forward on that.

10 We see that's a gap, now. It results in them  
11 making poor decisions, that then have to be reworked and  
12 just some general dissatisfaction.

13 So, if we can get some education in advance, we  
14 can get the right decisions made and the success.

15 MS. BAROODY: Great. Thanks Guy, appreciate it.

16 We are actually out of time, now. And I just  
17 want to thank everybody for your attention today, and  
18 participation. I feel like it's been a very helpful day  
19 for us, as we think about our next solicitation.

20 Please continue to send in your comments. We've  
21 got the AB 118 box, and my e-mail. And please send us  
22 more.

23 And I just want to thank our staff for their  
24 great job today. Sam and Tom has helped me a lot today,  
25 and Brian. And our team from AESC, thank you very much.

1 Thanks to all our panelists. Bye-bye.

2 (Applause)

3 (Thereupon, the Workshop was adjourned at  
4 4:01 p.m.)

5 --oOo--

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

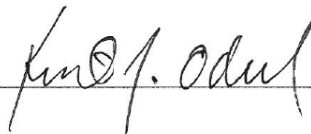
25

**REPORTER'S CERTIFICATE**

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of February, 2015.



---


Kent Odell  
CER\*\*00548

**TRANSCRIBER'S CERTIFICATE**

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of February, 2015.



---

Barbara Little  
Certified Transcriber  
AAERT No. CET\*\*D-520