MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

ZOOM PLATFORM

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

BYRON SHER AUDITORIUM

1001 I STREET

SACRAMENTO, CALIFORNIA

THURSDAY, APRIL 28, 2022

9:03 A.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

APPEARANCES

BOARD MEMBERS:

Liane Randolph, Chair

Sandra Berg, Vice Chair

Hector De La Torre

John Eisenhut

Senator Dean Florez

Davina Hurt

Gideon Kracov

Senator Connie Leyva

Tania Pacheco-Werner, PhD

Supervisor Phil Serna

Dan Sperling, PhD

Diane Takvorian

Supervisor Nora Vargas

STAFF:

Richard Corey, Executive Officer

Edie Chang, Deputy Executive Officer, Planning, Freight, and Toxics

Chanell Fletcher, Deputy Executive Officer, Environmental Justice

Annette Hebert, Deputy Executive Officer, Southern California Headquarters and Mobile Source Compliance

Edna Murphy, Deputy Executive Officer, Internal Operations

APPEARANCES CONTINUED

STAFF:

Rajinder Sahota, Deputy Executive Officer, Climate Change and Research

Craig Segall, Deputy Executive Officer, Mobile Sources and Incentives

Ellen Peter, Chief Counsel

Analisa Bevan, Zero-Emission Infrastructure Specialist, Mobile Source Control Division (MSCD)

Joshua Cunningham, Chief, Advanced Clean Cars Branch, Sustainable Transportation and Communities Division(STCD)

Rhead Enion, Senior Attorney Legal Office

Katherine Garrison, Air Resources Engineer, Transportation and Toxics Division

Jennifer Gress, PhD, Division Chief, STCD

Kelli Johnson, Attorney Legal Office

Stephanie Palmer, Air Resources Engineer, ZEV Market Advancement Section, STCD

Sydney Vergis, PhD, Division Chief, MSCD

ALSO PRESENT:

Marc Aprea, ChargePoint

Mitchel Baker, Assistant Deputy Director, California Department of Housing and Community Development

Angie Balderas, Sierra Club My Generation Campaign

Daniel Barad, Sierra Club California

Billy

Nick Blair, Association of California Water Agencies

APPEARANCES CONTINUED

ALSO PRESENT:

Michael Boccadoro

Morgan Caswell, Port of Long Beach

Dave Cook, Rail Propulsion Systems

Kristian Corby, California Electric Transportation Coalition

David Craig, California Bioenergy

Carleen Cullen, Cool the Earth

Frank Donnelly, Tractive Power Corporation

Steve Douglas, Alliance for Automotive Innovation

Annabel Drayton, Northwest Energy Coalition

Tyson Eckerle, Deputy Director, Zero-Emission Vehicle Infrastructure, Governor's Office of Business and Economic Development

Evan Edgar, Edgar and Associates

Ari Eisenstadt, California Environmental Justice Alliance, Regenerate California

Bill Elrick, California Fuel Cell Partnership

Sara Fitzsimon, California Hydrogen Business Council

Jay Friedland, Plug In America

Marc Geller, EV Charging for All Coalition

Gillian Gillet, California Department of Transportation

Elliot Gonzalez, Sierra Club

Paula Gruendling, Supervisor, Transportation Electrification Section, California Public Utilities Commission

APPEARANCES CONTINUED

ALSO PRESENT:

David Haake, MD

Ashley Hernandez, Communities for a Better Environment

Gary Hughes, Biofuelwatch

Aravind Kailas, Volvo Group

Chris King, Siemens Mobility

Tom Knox, Valley Clean Air Now

Kyle Krause, Deputy Director, Codes and Standards, California Department of Housing and Community Development

Sofi Magallon, Central Coast Alliance United for a Sustainable Economy(CAUSE)

Bill Magavern, Coalition for Clean Air

Kevin Maggay, Navistar International

Lisa McGhee, San Diego Airport Parking Company, GreenPower Motor Company

Miles Muller, Natural Resources Defense Council

Natalie Nax, Electric Vehicle Charging Association

Lori Pepper, Deputy Secretary for Innovative Mobility Solutions, California State Transportation Agency

Leela Rao, Port of Long Beach

Hannon Rasool, Deputy Director, Fuels and Transportation Division, California Energy Commission

Anja Raudabaugh, Western United Dairies

Enrique Rodriguez, Associate Construction Analyst, California Building Standards Commission

Priscilla Rodriguez, California Cotton Ginners and Growers Association, Western Agricultural Processors Association

APPEARANCES CONTINUED

ALSO PRESENT:

Catherine Ronan, Sierra Club California

Susanna Saunders

Akash Singh, Union of Concerned Scientists

Mikhael Skvarla, California Hydrogen Coalition

Sarah Swickard, Pacific Gas and Electric

Karim Tarraf, Hawa Dawa

Sven Thesen

Francesca Wahl, Tesla

Francis Yang, Sierra Club My Generation Campaign

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PROCEEDINGS

CHAIR RANDOLPH: All right. Thank you very much. Good morning, the April 28th public meeting of the California Air Resources Board will come to order.

Do we do the Pledge of Allegiance?

BOARD MEMBER SERNA: Yes.

CHAIR RANDOLPH: I didn't know that, because we didn't do it when we were remote. So, okay. What do we do?

There it is. Okay.

(Laughter.)

(Thereupon the Pledge of Allegiance was recited in unison.)

CHAIR RANDOLPH: Okay. Once again it is great to be back in person.

Okay. Board Clerk will you please call the roll.

BOARD CLERK ESTABROOK: Yes. Dr. Balmes?

Mr. De La Torre?

Mr. Eisenhut?

BOARD MEMBER EISENHUT: Here.

BOARD CLERK ESTABROOK: Senator Florez?

BOARD MEMBER FLOREZ: Here.

BOARD CLERK ESTABROOK: Assemblymember Garcia?

Ms. Hurt?

BOARD MEMBER HURT: Present.

BOARD CLERK ESTABROOK: Mr. Kracov?
BOARD MEMBER KRACOV: Here.
BOARD CLERK ESTABROOK: Senator Leyva?
Dr. Pacheco-Werner?
BOARD MEMBER PACHECO-WERNER: Here.
BOARD CLERK ESTABROOK: Mrs. Riordan?
Supervisor Serna?
BOARD MEMBER SERNA: Here.
BOARD CLERK ESTABROOK: Professor Sperling?
BOARD MEMBER SPERLING: Here.
BOARD CLERK ESTABROOK: Ms. Takvorian?
BOARD MEMBER TAKVORIAN: Here.
BOARD CLERK ESTABROOK: Supervisor Vargas?
BOARD MEMBER VARGAS: Here.
BOARD CLERK ESTABROOK: Vice Chair Berg?
VICE CHAIR BERG: Here.
BOARD CLERK ESTABROOK: Chair Randolph?
CHAIR RANDOLPH: Here.
BOARD CLERK ESTABROOK: Madam Chair, we have a quorum.
CHAIR RANDOLPH: Okay. Thank you so much. Okay. We will begin with a few housekeeping items before we get started this morning and our housekeeping items are different now that we're in person. You guys are going to get sick of me saying this clearly.

(Laughter.)

CHAIR RANDOLPH: So we are conducting today's meeting in person, as well as offering remove options for public participation both by phone and by Zoom.

Anyone who wishes to testify in person should fill out a request to speak card available in the lobby outside the Board room. Please turn it into a Board assistant -- assistant prior to the commencement of the item. If you're participating remotely, you will raise your hand in Zoom or dial nine, if calling in by phone. The clerk will provide further details regarding how public participation will work in just a moment.

For safety reasons, please note the emergency exits to the rear of the room through the lobby. In the event of a fire alarm, we are required to activate this room immediately and go down the stairs to the left of the elevator and out of the building. When the all-clear signal is given, we will return to the hearing room and resume the hearing.

A closed captioning feature is available for those of you joining us in the Zoom environment. In order to turn on the subtitles, please look for a button labeled CC at the bottom of the Zoom window, as shown in the example on the screen now.

I would like to take this opportunity to remind

everyone to speak clearly and from a quiet location, whether you are joining us by phone or on Zoom. Interpretation services will be provided today in Spanish.

If you are joining us using Zoom, there's a button labeled "Interpretation" on the zoom screen. Click on that interpretation button and select Spanish to hear the meeting in Spanish. If you are joining us here in person and would like to listen to the meeting in Spanish, please notify a Board assistant and they will provide you with further instructions.

I want to remind all of our speakers to speak slowly and pause intermittently to allow the interpreters the opportunity to accurately interpret your comments.

(Interpreter translated in Spanish)

CHAIR RANDOLPH: I will now ask the Board Clerk to provide more details on today's procedures.

BOARD CLERK ESTABROOK: Thank you, Chair Randolph.

Good morning, everyone. My name is Katie Estabrook and I am one of the Board clerks. I will be taking care of calling the commenters who are joining us today remotely and my co-clerk Lindsay Garcia will be calling on commenters who have signed up to speak and are joining us here in the room.

I'm going to provide some information on how

participation will be organized for those who are joining us in Zoom or are calling in to today's meeting. If you are joining us remotely and you wish to make a comment on one of the Board items or during the open comment period at the end of today's meeting, you will need to be using Zoom webinar or calling in by phone. If you are calling -- currently watching the webcast on CAL-SPAN and you wish to comment remotely, please register for the Zoom webinar or call in. Information for both can be found on the public agenda for today's meeting.

To make a verbal comment, we will be using the raise-hand feature in Zoom. If you wish to speak, please virtually raise your hand as soon as the item has begun to let us know you wish to speak. To do this, if you are using a computer or tablet, there is a raise hand button. If you are calling in on the phone, dial star nine to raise your hand. Even if you previously indicated which item you will be speaking on when you registered for the Zoom webinar, you must raise your hand at the beginning of the item, so that you can be added to the queue and your chance to speak will not be skipped. If you will be giving your verbal comment in Spanish and require an interpreter's assistance, please indicate so at the beginning of your testimony and our translator will assist you. During your comment, please pause after each

sentence to allow the interpreter to translate your comment into English.

When the comment period starts, the order of commenters will be determined by who raises their hand first. And I will call each commenter by name and will activate each commenter's audio when it is your turn to speak. For those calling in by phone, I will identify you by the last three digits of your phone number. You will not see a list of commenters in Zoom. However, I will be announcing the next three or so commenters in the queue, so you are ready to testify and know who is coming up next. Please note that you will not appear by video during your testimony.

I would also like to remind everyone to please state your name for the record before you speak. This is important -- especially important for those who are calling in by phone to testify on an item. There will be a time limit for each commenter. The normal time limit is three minutes, though this could change based on the Chair's discretion. During public testimony, you will see a timer on the screen. For those who are here in person, there will be a clock running here in the room. And for those that are calling in by phone, we will run the timer and let you know when you have 30 seconds left and when your are time is up. If you do require Spanish

interpretation for your comment, your time will be doubled.

If you wish to comment -- if you wish to submit a written comment on one of the items today, please visit CARB's send-us-your-comments page or look at the public agenda on our webpage for links to send these documents electronically. Comments will be accepted on each item until the Chair closes that item.

If you experience any technical difficulties, please call (804)772-2715 and an IT person can assist you. This number is also on the public agenda.

Thank you, Chair. I'll turn it back to you.

CHAIR RANDOLPH: Thank you.

The first item on the Agenda is Item 22-6-1, an informational update on zero-emission vehicle infrastructure. If you're here with us in the room and wish to comment on this item, please fill out a request-to-speak card and submit it to the Board assistant. If you are joining us remotely and wish to comment on this item, click the raise-hand button or dial star nine now. We will call on both in-person and remote commenters when we get to the public comment portion of this item.

Zero-emission infrastructure is critical to meeting our clean air, climate, and community goals. I'm

focused on working with many State, and local government bodies, and the private sector to support deployment of reliable and accessible zero-emission infrastructure. Prioritizing equity as we consider how this infrastructure should be deployed will be critical to the success of that deployment.

It's timely that we're hearing an informational item today on the State's infrastructure goals and activities. Many of our regulatory decisions in the coming year will have a zero-emission technology focus and infrastructure is critical to the rollout of these measures.

I especially appreciate our partner agencies who are here to provide a complete picture of the actions that the State is undertaking in a coordinated way to support zero-emission infrastructure development.

Mr. Corey, will you please introduce the item?

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair.

And as you mentioned, zero-emission infrastructure deployment is crucial to meeting our goals. CARB is working with our State partner agencies, as you noted, to ensure fueling infrastructure sufficient to support the market now and as well as in the future for zero-emission vehicles and equipment.

Starting with an overview from CARB's

Zero-Emission Infrastructure Specialist, Analisa Bevan, today we'll hear from a panel of State agency representatives on the breadth of analysis, planning, and actions underway to support zero-emission fueling infrastructure. We'll hear from the Governor's Office of Business and Economic Development, the California Public Utilities Commission, the California Building Standards Commission, the California Department of Housing and Community Development, the California State Transportation Agency, and the California Energy Commission. These activities support the State's ZEV targets outlined in Governor Newsom's Executive Order N-79-20.

To meet the State's ZEV targets, CARB staff are developing a portfolio of new zero-emission regulations across many sectors as you know. And in the year ahead presentation that I gave in January, we touched on regulations the Board will hear this calendar year.

Already, the Board has heard two of these regulations. In February, the Board adopted the first Off-Road Fleet Regulation in the nation requiring zero-emission equipment when it approved the amendments to the transport refrigeration units Airborne Toxic Control Measure. In March, the Board considered amendments to the Commercial Harbor Craft Regulation that included a zero-emission requirement for vessels.

The Board will consider several more zero-emission regulations this year, among them the Advanced Clean Cars II this summer and the Advanced Clean Fleets Regulation later this fall. More regulations from other sectors will come in the next few years.

To meet these needs now and in the future, as CARB's Zero-Emission Infrastructure Specialist, Ms. Bevan, is leading CARB's coordinated effort with the State's partner agencies to ensure a zero-emission infrastructure network will be in place to support the portfolio of CARB's planned zero-emission regulations.

It is critical that this infrastructure be equitably distributed and priced, reliable, and open to all. Ms. Bevan will provide an update on CARB's activities and coordination with our State agency partners on the fueling infrastructure system, private and public, that will increase the operational range and penetration of zero-emission technologies throughout the State in rural areas, cities, disadvantaged communities, and everywhere in between.

CARB has been contributing to the development of infrastructure in several ways, including through regulation, through providing critical data and analysis for statewide planning, and through facilitating communication between regulated parties, fuel providers,

and infrastructure providers.

With that, I'll now ask Analisa Bevan to begin the staff presentation that will include presentations from our sister State agencies, as I noted.

Analisa.

(Thereupon a slide presentation.)

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Thank you, Richard.

Good morning, Chair Randolph and members of the Board. My name is Analisa Bevan. I am CARB's Zero-Emission Infrastructure Specialist. In this new role, I've been working with divisions across the agency who have ZEV programs, as well as with our partner agencies, with lead rolls in infrastructure planning and funding to assess needs, coordinate efforts, and assist with stakeholder engagement. Over the last year, I've been working with our partners and with staff across CARB to better understand what concerns stakeholders have regarding fueling infrastructure and what actions the State is taking to address those concerns.

Today's presentation will provide an overview of these issues and actions with presentations from six of our partner agencies on their programs. We welcome questions and conversation about the infrastructure rollout and hope that this informational item will help

create a foundational background on infrastructure, in preparation for the upcoming regulatory proposals the Board will hear this year.

As you no doubt know, California is transitioning aggressively to ZEVs. The Governor's Executive Order N-79-20 sets targets for a hundred percent new car ZEV sales by 2035 and full fleet transition of trucks, buses, and off-road equipment between 2035 and 2045. The time frames identified in the EO will be achieved through a variety of actions to build the market, including regulation, incentives, infrastructure, and educational outreach.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: We need to transition to ZEVs in order to meet health based air quality standards and climate targets. Many of the measures in the State SIP strategy are ZEV focused, and similarly, the Draft Scoping Plan scenarios for reaching our climate emission reduction targets are dependent on phasing out combustion and growing electrification for transportation.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: The ZEV market transformation will not succeed without fueling infrastructure. How and when

infrastructure is deployed is critical to ensuring success. Equitable access to infrastructure, meaning convenient, reliable, and affordable access for all is crucial. This is especially important in communities long burdened by transportation emissions.

Thus, infrastructure activities complement CARB's regulation actions. The Board has heard and adopted several regulations recently with ZEV components, and nearly every motor vehicle and off-road regulation planned will similarly have ZEV requirements.

For today though, I'll focus on two regulations the Board will hear this year, Advanced Clean Cars II, and Advanced Clean Fleets, as illustrative of the infrastructure needs and actions in play.

We've heard through development of these regulations concern about infrastructure issues. This presentation will cover those issues and many of the actions the State is taking to address them.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Considering equity at every step in this transition to ZEVs is critical. ZEVs have to work for everyone. They should, in fact, be a pathway to improving transportation in communities for underserved and disadvantaged populations. And fueling infrastructure

cannot be a barrier to excess -- accessing ZEVs.

When building something new, we have an opportunity to do things differently, to do them right from the start. That exists now with ZEV infrastructure. We must keep equity and accessibility in mind while creating new systems for fueling.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: ACC II is slated to come to the Board in June. This regulation will chart a path to a hundred percent ZEVs by 2035. The proposal includes several consumer assurance provisions and I'll touch on the infrastructure related items.

The proposed regulation would require standardization of the power requirements for on-board chargers and require vehicles to have DC fast charge inlet compatible with the SAE CCS standard, taking the state one step closer to a single standard for DC fast charging.

Additionally, the regulation includes a provision requiring the inclusion of a charging cord set that would enable convenience charging at either a 110-volt outlet or a 220-volt outlet.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: The Advanced Clean Fleets Regulation is scheduled

to come to the Board in October. This regulation complements the Advanced Clean Trucks Regulation, which requires the sale of zero-emission trucks. ACF proposes requirements that will transition public, drayage, and high priority fleets to a hundred percent ZEVs by 2040, and the earliest requirements for fleets to begin transitioning to ZEVs start in 2024.

The variety of fleets included in this proposal points to the broad infrastructure solution set that will be needed for these fleets.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: I'll turn now to what is needed for successful infrastructure beyond sher numbers.

A focus on home charging, that's -- for light-duty vehicles the priorities include a focus on home charging. That's where most fueling happens. It's a significant benefit of driving an EV and therefore it's important to ensure all homes, especially multi-family homes, have access to charging. Similarly, it's important to establish a robust public charging and hydrogen fueling network to create an environment where ZEVs can fully replace conventionally fueled vehicles.

We are increasingly hearing concerns that we make sure there is rural coverage for ZEV fuels, and ensuring

equitable access to zero-emission fuels is a top priority. Consumers need confidence that zero-emission fueling will be reliable and available. And accessing -- accessing zero-emission fuel should be as easy as accessing conventional fuels.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: On the medium- and heavy-duty side, we've learned from our ACS development process that fleets need the following. Both electricity and hydrogen will be relied upon by fleets sometimes even the same fleet. Equitable access is a priority especially for small and owner-operated fleets. A public contract -- a public or contracted off-site fueling network that supports fleets with and without access to their own depot fueling is important.

With the proposed implementation schedule for ACF, we need a rapid and large scale deployment plan. Fleets want assurance that the grid will be able to handle the increased and sometimes concentrated load and fueling standards geared to heavy-duty vehicles for both electricity and hydrogen are needed to ensure reliable fueling.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST

BEVAN: Our panel will demonstrate many State agencies play a role in supporting the development of needed zero-emission infrastructure. CARB has several broad roles, including targeted regulation, a critical analytical data source for planning, and as a conduit for communication between vehicle, and infrastructure stakeholders.

Some of our regulatory roles include the following. We're tasked with adopting and implementing the EVSE access regulation, which you'll hear more about in the next item on today's agenda. We include vehicle provisions that enable infrastructure as part of the ACC II regulation. CARB is a subject matter expert for development of the CALGreen Building Standards, HCD and BSC will cover CALGreen later in this panel. And we developed fueling protocols and testing standards for hydrogen.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST

BEVAN: As an information source, we hold critical data regarding vehicle populations and projected fleet changes. Through programs developed for the statewide SIP and Scoping Plan, as well as our regulatory development work, we model zero-emission vehicle market growth. These projections, along with aggregated production plans,

reported to CARB aggregated fleet plans reported through the Advanced Clean Trucks Regulation feed into infrastructure planning efforts at energy and transportation agencies for both electricity and hydrogen.

For example, in addition to providing fleet and inventory data to CEC for infrastructure planning, we're supporting CTC's development of clean freight corridor assessments through emissions analysis and fleet data sharing. And as subject matter experts, we provide cost analysis and technical expertise in the development of CALGreen building code requirements for EVSE.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: As communications facilitator, we act to connect our regulated communities on the vehicle side, that's manufacturers, drivers, and fleets, with the infrastructure solution providers. I'm going to dwell on this role for a few slides to talk through one example of how we've been acting in this capacity.

Through our ACF workshops, it became clear that there was a need for concentrated infrastructure conversations. We held five workgroup meetings to hear stakeholders' concerns, bring the right experts together, and talk through issues and solutions. For these workgroup meetings, we were joined by our partner agencies

so that stakeholders could hear firsthand about programs to address infrastructure needs.

We used a large panel format to encourage back-and-forth dialogue. The panels included up to 40 participants, while over 200 additional stakeholders listened in and used the chat feature to contribute. And all of the workgroup meeting recordings are posted on YouTube.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: As a way of grounding our workgroup conversations, we started each meeting with a word cloud exercise site. We invited all participants to tell us what they worry about with regard to zero-emission infrastructure topics we were discussing.

The image on this slide was pretty typical of the feedback we got during these word cloud exercises with a focus on cost, reliability, grid capacity, and interoperability.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: I'd like to provide now a very high level summary of the more common issues we discussed in these workgroup meetings. We heard loud and clear that many fleets and owner/operators will be depending on public

infrastructure -- on public infrastructure network, even if they have a home base and on-site depot fueling.

There is concern about the operational requirements that will be needed for medium- and heavy-duty fueling as well as overall concern about the reliability of such equipment. A number of fleets expressed concern about depending on electricity as a fuel because of the potential for interrupted service due to power outages, Public Safety Power Shutoffs or exceeding a available electrical load.

We discussed the environmental impacts of zero-emission fuels, specifically the availability of low cost and low carbon intensity hydrogen and electricity, and we had extensive discussion about the costs and time needed to install zero-emission infrastructure, and whether it could be done in time to meet regulatory timelines for operating zero-emission vehicles.

Further, the workgroups talked about equitable access to infrastructure, especially as it relates to small fleets and owner/operators. We also had some discussion around understanding how ZEV infrastructure may impact or benefit communities. A number of participants talked about how they may not have site control of their fleet location, and may not be able to get their landlord to agree to upgrades needed to install infrastructure.

Similarly, they may not have the space to accommodate zero-emission fueling. And the integration of on-site energy generation through renewables, coupled with energy storage, was discussed, especially as a strategy for ensuring uninterrupted electrical service to ensure operations are not impacted by power outages.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: I don't want to portray these meetings as having solved all of those issues. They open the dialogue --

(Laughter.)

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: -- connect stakeholders to solutions, and point to further work. Fundamentally they provide a forum for listening. We learned that early information sharing is critical -- is critically important. We want to continue talking about how we can facilitate that. One concrete outcome from the meetings at the request of participants, GO-Biz has created a list of consultants available to help fleets with infrastructure. It's clear that more outreach tools, case studies, and opportunities to connect stakeholders is necessary.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: There are many partners involved in making the

zero-emission infrastructure ecosystem work, from government agencies, to fuel providers, to infrastructure companies, vehicle manufacturers, and end users. It's important for all of us to work together. I'd like to turn now to our panel of State partners.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Some of our key partner agencies are here today to talk about their important roles in developing the zero-emission infrastructure needed to support the state's ZEV market.

I'd like to introduce our panel now. We have Tyson Eckerle, the Deputy Director for Zero-Emission Vehicle Market Development at the Governor's Office of Business and Economic Development; Paula Gruendling, Supervisor for the Transportation Electrification Section of the California Public Utilities Commission; Enrique Rodriguez, Associate Construction Analyst at the California Building Standards Commission; Kyle Krause, who's Deputy Director for Codes and Standards at the Housing and Community Development Division of Codes and Standards; and Mitchel Baker, Assistant Deputy Director, for HCD Division of Codes and Standards; Lori Pepper, Deputy Secretary for Innovative Mobility Solutions at the California State Transportation Agency; Hannon Rasool,

Deputy Director of Fuels and Transportation Division at the California Energy Commission.

So Tyson, I am turning the presentation over to you.

TYSON ECKERLE: Great. Thank you, Analisa, and thank you, Board. It's great to be here in person together.

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TYSON ECKERLE: And I think, you know, if you take a step back and what California's secret sauce really is I think Analisa described it really well, as an example those workshops. It's -- you know, we have the right people at the table. Like, will it be easy, no, but do we have the right people there to solve the problems together and the answer is yes. And so that's what gives me a lot of confidence in folks -- hope.

And if you go to the next slide --

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TYSON ECKERLE: -- that's really central to the -- what we have at the end of this is the staff market development strategy that we use to coordinate all of our stakeholders. And the idea there is to get everybody pulling in the same direction. It's agencies, it's industry, NGOs, federal government, utilities, you know, local, regional, tribal governments all pulling that same

direction. And I think if -- we've presented to the Board before, so I won't belabor the image here, but, you know, trying to get everybody around those four pillars of the market vehicles, infrastructure, end users, and workforce. And today, you know, we're really looking through the lens of infrastructure. And so if we get the infrastructure in the ground, it will enable end users to purchase the vehicles and put them to work.

One principle that I do want to make sure we dwell on a little bit is putting equity into every decision. And we're trying to do that as much as possible -- well, we are doing that as much as possible. We can always improve there.

And so if you go to the next slide --

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TYSON ECKERLE: -- we have a bunch of information we're trying to simplify, you know, kind of what is State government doing, how is the market behaving. On our GO-Biz website, we have a bunch of this stuff. But I wanted to zone in a little bit on the agency action plans. And so you'll hear from a number of our agency partners today, but there's, you know, 29 agencies -- you know, I should have counted those again. I think it's 29, that -- up there with agency action plans. And they all tie back to the objectives that are

laid out in the ZEV market development strategy, and then what we're going to do to help meet those objectives. It's -- you know, one example is -- you'll hear later, it's about the EVSE regulation, the importance of equity and access, and what CARB can do to make sure that EV drivers have access to charging stations no matter where their economic strata is and importance of that. And you'll hear more as you go down the table here.

If you go to the next slide --

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TYSON ECKERLE: -- I wanted to zone in. This is kind of the new thing that we've just pushed out. And we're aggre -- starting to aggregate data and give a clear picture, where you can just pick up a couple pieces of paper and have an understanding for how the market is performing. And these trend lines look really good. And this is -- you know, we're not making anything up. We're just aggregating the data here. This is -- you know, we pulled the graph from below. You know, through 2021, we had over 12 percent market share in the light-duty sector. Quarter 1's 1 data is out now. This -- and we're at 16 percent. So that's trending in the right direction.

There's, you know, 159 zero-emission vehicles in the HVIP Program, which is excellent as well. So we're tying to figure out ways, you know, we can just take a

snapshot. Each quarter we'll be publishing this, so you can see, okay, do we need to adjust some of these. That's on the vehicle side.

On the infrastructure side, if you go to the next slide --

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TYSON ECKERLE: -- we just have the light-duty -- you know, use these kind of as fundraising -- like a -- you know, like a fund raising image type of thing. So we have our 2025 targets and we are on track to meet those, at least from a funding perspective. There's a lot of work ahead. This is on the light-duty side. We're working on the heavy-duty side to, you know, get a better picture of what that looks like, but oftentimes the heavy-duty stations are tied directly to fleets. And so the Energy Commission is actively collecting that data and we'll figure out how to visual that.

If you go to the next slide, you know, the end-user pillar is always kind of an interesting. Like, how do you capture a feeling? And are people confident that they can get into the market.

But the one that was interesting to us as a consumer reports thing, there's, you know, 26 percent of Californians surveyed in 2020 said they would consider a zero-emission vehicle or they would buy -- they're going

to buy a zero-emission vehicle for their next vehicle, which is good considering we're at 16 percent market share now. And but the interesting part is that was that, you know, compared to four percent of the national market.

So we're tweaking these and kind of -- you know, there's some -- some other -- some numbers up there.

And then finally, just on the workforce side, you know, all this investment, all this regulation -- if you go to the next slide --

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TYSON ECKERLE: -- has really driven in, you know, what our -- what we're leading with in California. And so we're the number one spot for EV-related manufacturing. So we have over 13,000 EV manufacturing jobs in California. It's because of our strong regulatory policy environment and investments we make. We have 43 ZEV-related manufacturers in the State. And we have investment to do more with that $250 million that is at the Energy Commission to help make sure that we keep -- expand and attract ZEV manufacturing. And on the topic of investment, if you go to the next slide --

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TYSON ECKERLE: -- I won't go into all the detail. There's a lot of stuff up here and I think we've heard

But the top line thing says $10 billion is the proposal. You know, and I think you're all pretty familiar with that. Up there, there's, you know, two types text. The black text is what was approved last year in the California Comeback Plan and then the blue text is the new stuff that we're adding. There's a bunch of investment in infrastructure. And Hannon will go into those details, so I won't -- I'll spare you here.

But I did want to also touch on the next slide --

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TYSON ECKERLE: -- is it's not the State government anymore, it's the federal government. We have a lot of investment coming in there, the five billion for building out EV charging infrastructure, which, you know, 383 million will come to California. There's the competitive grants, which has 2.5 billion.

The hydrogen thing, we're actually coordinating the hydrogen hub application here at -- through GO-Biz where there's $8 billion to create at least four hydrogen hubs throughout the State -- throughout the United States. I think we're in a very good position here to leverage that and create a robust, you know, transportation green hydrogen network.

And then just briefly on that, if you go to the next slide --

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TYSON ECKERLE: -- you know -- and we can go into more detail in another time, but, you know, just thinking about that federal investment and how we couple it with the State investment, what are we trying to do on the hydrogen side. And it's really we're after three core outcomes: it's time, money, and innovation. And on the time side, we're trying to accelerate the time to -- accelerate the market as much as possible, so making sure that our transition is quick. I think we can gain 5 or 10 years with this investment. It's the money side. Making sure -- like in California, one of our unique things is we have the opportunity to create a financially sustainable, low carbon market. And it's because of the great policies that have been permeated by this Board. Like the Low Carbon Fuel Standard, for example, is always looked at as the leading reason that we are -- we have success in California and can build the economically viable market.

And then on the innovation side, it's innovation on the technology, but it's also innovation on policy, and it's also looking at this Board. And people look to California to lead and how can we create the economic signals to make this all gel and come together. And once we get to this -- you know, those low cost hydrogen, you know, per kilogram, lost kilowatt hour for the fleets,

it's -- you know, it starts to become game over.

And so with that, I want to hand it over to Paula Gruendling -- did I nail it?

PAULA GRUENDLING: Yes.

TYSON ECKERLE: Okay -- at the CPUC.

Thank you.

(Thereupon a slide presentation.)

PAULA GRUENDLING: That's a good job, Tyson. Thank you.

Good morning. I'm Paula Gruendling. I'm the Supervisor for the Transportation Electrification Section at the PUC.

So the Transportation Electrification team is responsible for the assessment of the regulated utilities transportation electrification budget requests, program oversight, and evaluation, as well as support on policy development and implementation. The team also supports infrastructure, planning activities.

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PAULA GRUENDLING: So several activities took place since the release of the 2020 transportation electrification framework, or TEF, as we call it, which was a staff proposal on the draft rulemaking. So since then, we rolled out implementation of Assembly Bill's

841's requirement that all utility side of the meter cost be covered by ratepayers. The tariffs are available for all customers as of this month. Approved two major electric vehicle infrastructure programs for Southern California Edison and San Diego Gas and Electric. We also issued three decisions and provided other direction related to the 2020 TEF, so we kept that process going.

And we have been working to support alignment of planning activities related to transportation electrification, infrastructure deployment.

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PAULA GRUENDLING: So the CPUC also issued a ruling with the staff proposed updates to the 2020 TEF outlining the structure for programs post-2025. Base on the feedback that we received on the original TEF and the activities since its release, the CPUC issued update to the proposal in February this year. The proposal establishes funding cycles and sets a budget for funding cycle 1 starting in 2025. It proposes a third-party run program for customer side of the meter rebates allowing the utility to focus on planning and deployment of customer side infrastructure, which will be quite an effort. And we expect the decision on these and the other remaining TEF issues this year.

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PAULA GRUENDLING: The staff proposal covers several updates, but one of the main features is establishment of funding cycles. So the proposed funding cycle structure allow for spending of authorized funding for existing programs through 2024. After that, it proposes $1 billion over five years to support customer side of the meter infrastructure, technical assistance, and marketing, education, and outreach support, which would start in 2025.

This would be a statewide program, as I said, focused mainly on medium- and heavy-duty and most unit dwelling charging infrastructure and use, as we understand, to need still significant resources to support electric vehicle adoption growth.

And funding cycle 2, which would start in 2030, would assess the continue need for customer site support as well as other planning priorities that we identify along the way.

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PAULA GRUENDLING: So on grid planning activities, CPUC staff has been actively collaborating with Energy Commission, ARB, and CAISO at the Joint Agency

Steering Committee, the JASC, on the development of a high electrification demand scenario, which would include buildings and transportation, which would include higher assumptions for electrification load than what was included in the 2021 Integrated Energy Policy Report, or the IEPR.

For transportation electrification specific, the scenario will be forecasting the impact of CARB's pending Advanced Clean Cars II and Advanced Clean Fleets regulations over and beyond what would naturally occur out to 2035. And electrification planning assumptions are currently scoped in the distribution planning process as part of the high distributed -- distributed energy resources proceeding and in the integrated resources proceeding for assessment of infrastructure needs.

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PAULA GRUENDLING: Finally, for the Public Safety Power Shutoffs, the update I have is that the regulated utilities are still implementing guidance provided in the 2020 decision. The guidance covers how the utilities are to notice EV drivers about PSPS events, how they should increase the resiliency of charging infrastructure during and after a PSPS event, and how the utilities should provide off-grid charging options to areas impacted by

those events.

And that concludes my update. And with that, I'll pass on to Enrique Rodriguez from the California Building Standards Commission.

Thank you.

(Thereupon a slide presentation.)

ENRIQUE RODRIGUEZ: Thank you, Paula. I appreciate that.

Good morning, Madam Chair, and Board members. My name is Enrique M. Rodriguez, Associate Construction Analyst for the California Building Standards Commission. Thank you for giving CBSC the opportunity to present a high level overview of CALGreen, and the CBSC rulemaking process.

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ENRIQUE RODRIGUEZ: The California Building Standards Commission's primary functions include the following: reviewing State building standards proposed by State agencies; developing building standards for non-residential occupancies, where there is no other State agency that has authority within CALGreen; adopting and approving building standards for publication; codifying approved building standards; filing approved building standards with the Secretary of State; contracting to publish California Building Standards code; and lastly,

acting as a State depository for local government modifications.

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ENRIQUE RODRIGUEZ: A Little CALGreen history. Title 24, Part 11 is the California Green Building Standards Code, which we nicknamed to simply say CALGreen. It's the first in the nation Green Building Standards Code.

Back in 2007, CBSC was directed to develop Green Building Standards in an effort to meet the goals of California's landmark initiative Assembly Bill 32, known as the California Global Warming Solutions Act, AB 32, Chapter 88 statutes of 2006 added Division 25.5 to the California Health and Safety Code, an established law requiring a comprehensive program for the reduction of greenhouse gas emissions to 1990 levels by the year 2020.

Then in 2016 to further the goals of Assembly Bill 32, AB 32, of 2006, the Legislature enacted Senate Bill 32 -- SB 32 2016 which required -- requires CARB to ensure that California's statewide greenhouse gas emissions are reduced to at least 40 percent below the 1999 -- 1990 levels by the year 2030. This bill was needed since AB 32's Scoping Plan identified buildings as the second largest source of California's greenhouse gas emissions.

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ENRIQUE RODRIGUEZ: The main goals for the CALGreen code are to reduce greenhouse gas emissions in -- from buildings, promote environmentally responsible, cost effective, healthier places to live and work, reduce energy and water consumption, respond to the environmental directives from the administration.

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ENRIQUE RODRIGUEZ: The CALGreen Code was first published in 2008 with an effective date of August 2009. At the time, the CALGreen code only had voluntary code provisions. Then in 2009, it -- during -- for the 2010 CALGreen Code was created and established for the first time mandatory green regulations, which became effective January 1 of 2011.

The 2010 code was broken down by divisions: Planning and Design, Energy Efficiency, Water Efficiency and Conservation, Material Conservation and Resource Efficiency, and then lastly Division 5, which was environmental quality.

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ENRIQUE RODRIGUEZ: This new 2022 CALGreen code that was just approved by the Commission is being -- currently being published and will become effective January 1 of 2023. We just started our 2022 intervening

code adoption cycle. This will develop the supplemental blue pages in the code books, and then this intervening code supplement becomes effective July 1 of 2024.

A little bit of the current timelines for this intervening code cycle that we're just started. It started mid-April with the -- what we call our pre-cycle workshops. We had a meeting -- a joint workshop BSC, HCD, and DSA, which was held April 14th.

Then between February and March of 2023, we will have the Code Advisory Committee meetings. Around April 2023, we'll start our 45-day public comment period. And then in July of 2023, the Commission -- commissioners will convene and review the proposed rulemaking packages from the various State agencies.

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ENRIQUE RODRIGUEZ: So for this recently approved 2022 CALGreen Code, the significant changes that will become effective January 1 of 2023, basically this coming year, significant expansion of EV regulations for non-residential occupancies, which include newly constructed warehouses, grocery stores, and retail stores with off-street loading spaces, will require mandatory electric vehicle infrastructure for medium-, heavy-duty vehicles.

For the first time in Division 5.1, it will

require mandatory electric vehicle supply equipment, installations using Level 2 and/or direct current fast chargers. The use of automatic load management systems have also been added to the code, as an alternative compliance method.

And then lastly, Tier 1 and Tier 2, voluntary electric vehicle capable -- capable space code provisions have been increased from 15 to 30 percent for Tier 1 and 20 percent to 40 percent for Tier 2. Both Tier 1 and Tier 2 require that 33 percent of the EV capable spaces have electronic vehicle supply equipment installed.

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ENRIQUE RODRIGUEZ: BSC, DSA, and HCD are currently conducting joint pre-rulemaking workshops with the first workshop already held on April 14th, 2022. The upcoming workshops are tentatively scheduled for June 16th, August 18th, and September 22nd.

BSC is researching potential code changes for the intervening code cycle, which will produce the blue supplemental pages I mentioned before. And some of these possible changes may include to develop EV infrastructure for certain additions and alterations, to align with HCD for low power EV installations, and to develop a reference standard for automatic load management systems.

Finally -- next slide please -- I believe, oh

yeah. Finally to get involved with our BSC rulemaking process, you can attend our workshops and Code Advisory Committee meetings, and participate in the public comment periods as well. To stay informed access our website at dgs.ca.gov, G-o-v forward slash BSC and visit the contact us page to sign up for our email notification list.

That concludes my presentation. Now, I would like to hand off the mic to Mr. Kyle Krause and Mitchel Baker from HCD.

(Thereupon a slide presentation.)

KYLE KRAUSE: Thank you, Enrique. Good morning. My name is Kyle Krause. I'm the Deputy Director of Housing and Community Development's Division of Codes and Standards. With me today, as you've heard, is Mitchel Baker, my Assistant Deputy Director who oversees our code development and analysis section in the State Housing Law Program.

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KYLE KRAUSE: HCD falls under the Business and Consumer Services and Housing Agency. And we've been working on EV charging standards for almost a decade, in partnership with Building Standards Commission, CARB, Energy Commission, and all of our numerous stakeholders.

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KYLE KRAUSE: Mitchel will provide you with information HCD's authority and role in adoption of Green Building Standards.

Mitchel.

MITCHEL BAKER: Thank you, Kyle. Thank you, Board. The law identifies HCD as a proposing agency and delineates that HCD must adopt substantially the same requirements found in the current model codes. Also, relevant to the conversation HCD was charged with, pun intended, proposing for adoption multi-family electric vehicle charging infrastructure requirements, which I'm happy to report we accomplished through the triennial code adoption cycle.

HCD is also responsible for maintaining regulations in Title 25 of the California Code of Regulations. And as Enrique discussed, the Building Standards Commission takes on the role of a charge agency for Building standards.

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MITCHEL BAKER: HCD's role -- HCD's role includes proposing for adoption CALGreen Building Standards for residential occupancies. During the last triennial code adoption cycle, HCD made a quantum leap in launching

actual charger requirements from multi-family housing, hotels and motels, expanding on the 10 percent capable parking space requirements. The proposals which are effective January 1st, 2023, include, 25 percent low level power two receptacles.

Additional, five percent low level charger 2 are required when 20 or more dwelling units or guest rooms are provided. There are also triggers in place when parking facilities expand or undergo alterations. Is it important to note that building standards -- and these building standards in particular apply to new construction, and there are statutory protections in place for existing buildings to maintain their current construction.

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MITCHEL BAKER: The next cycle is the 2022 intervening code adoption cycle. And HCD plans to work closely with stakeholders through the newly reformed CALGreen EV Workgroup to incrementally and responsibly increase charging access in multi-family housing, hotels, and motels. We anticipate stakeholders will express the desire for more Level 2 -- low Level 2 power chargers or receptacles.

Back to Kyle.

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KYLE KRAUSE: Thank you Mitchell.

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KYLE KRAUSE: So in addition to our recent accomplishments achieving low power Level 2 charging receptacles --

(Phone disconnected.)

BOARD CLERK ESTABROOK: Okay. We're just going to take a break so we can reconnect to the Zoom, the call-in number, so people can hear us.

Chris, can you put up a technical difficulties slide.

Sorry, for the interruption.

(Laughter.)

(Reconnected to Zoom)

BOARD CLERK ESTABROOK: All right. We're ready to get back started.

KYLE KRAUSE: Thank you. Kyle Krause, HCD.

Just to get back into our presentation. As Mitchel pointed out, we were successful in increasing EV charging access in multi-family hotels and motels effective January 1st by adding 10 percent -- or I'm sorry, 25 percent EV charging receptacles. These are the low power Level 2 receptacles and also five percent of the parking will have Level 2 chargers -- full power Level 2

chargers.

Some of the challenges we face looking forward that we all need to be concerned about are concerns with the grid stability and challenges related to the grid and infrastructure. There's also cost barriers, such as retrofitting of existing buildings and utility company service capacity potential challenges, as well as on-site electrical panel capacity to handle additional electrical loads. These can present significant challenges to providing EV charging access, as well as identifying appropriate triggers to require retrofitting of existing building parking facilities. So that concludes HCD, now I'll kick it over to Lori with Cal STA.

LORI PEPPER: Great. Thanks so much, Kyle.

(Thereupon a slide presentation.)

LORI PEPPER: Good morning, Chair Randolph and members of the Board. Thanks so much for having me here today. I'm Lori Pepper and I'm the Deputy Secretary for Innovative Mobility Solutions at the California State Transportation Agency, which oversees the eight transportation-related State departments. In my role, I work to apply technology and best practices to the transportation ecosystem to ease mobility for people, goods, and services through the state.

So I work on a wide variety of issues, which

includes ZEV infrastructure. And today, I'm going to provide a brief overview of the Climate Action Plan for Transportation Infrastructure, or CAPTI, with which I believe you are all very well knowledgeable about, and how it addresses ZEV infrastructure investment, as well as a status update on the implementation of the National Electric Vehicle Infrastructure Program, or NEVI, which was created by the partisan infrastructure law.

I also want to note that we have a webpage on our website that provides resources related to implementation of the transportation provisions of the federal infrastructure law.

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LORI PEPPER: So on July 12th, 2021, CalSTA unveiled the final version of CAPTI, which details State recommendations on investing discretionary State tran -- or discretionary transportation dollars to aggressively combat and adapt to climate change, while supporting public health, safety, and equity. CAPTI builds on executive orders signed by Governor Gavin Newsom in 2019 and 2020 targeted at reducing greenhouse gas emissions in transportation.

CalSTA developed the draft -- or developed the CAPTI through collaboration with many different State

agencies, including the ones represented on today's panel, along with extensive outreach and engagement with hundreds of stakeholders.

One of the investment strategies highlighted in CAPTI is to include deployment of light-, medium-, and heavy-duty zero-emission vehicle infrastructure as part of larger transportation projects, while supporting market innovation and equitable access to all.

I included an additional slide in your written materials to show how ZEV infrastructure deployment investments fit into the rest of the CAPTI principles.

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LORI PEPPER: So I want to first establish that implementation of the NEVI program is currently fluid as we are working with partner agencies and public stakeholders to create the deployment plan due to the federal joint office, which is an entity borne out of the U.S. Departments of Transportation and Energy.

So California expects to receive 383.7 million over five years to create a battery charging infrastructure network in the State. The guidance released by federal -- by the federal government tells us that the network should be publicly accessible and should first fill gaps in existing alternative fuel corridors.

So the plan I referenced earlier is due to the joint office by August 1st. And we will receive feedback and approval through Federal Highway Administration, or FHWA, by September 30th. Following approval of the deployment plan, FHWA will begin to release funding.

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LORI PEPPER: We are creating a formal agreement with the Energy Commission that will rely on existing expertise at both Caltrans and the CEC in order to implement -- implement the NEVI program. And so this includes following the equitable access principles of the California Integrated Travel Program, also known as Cal-ITP, for inclusive payment systems filled out for all payment cards to be used, whether they're equipped with swipe, chip, or tap technology.

And the collaboration with the CEC would also ensure that this funding fits in with the principles of the ZEV Infrastructure Plan that the CEC is currently developing. We created a public stakeholder working group called Transition to Zero Emissions that currently focuses on NEVI implementation and expect to create additional venues for public input as the process progresses.

Finally, we are going to launch the NEVI Coordinating Council with the CEC to formalize State

agency input. And with that, I will turn it over to Hannon Rasool awe energy commission.

(Thereupon a slide presentation.)

HANNON RASOOL: Great. Thank you. Good morning. My name is Hannon Rasool. And I'm the Deputy Director of the Fuels and Transportation Division at the California Energy Commission.

California has a strong history of thoughtful policies, robust incentive programs, and regulations that provide direction to the market. In fact, that clear direction and signal has encouraged additional private investments in infrastructure and will continue to do so.

The Energy Commission and other agencies have made significant investments to prepare California for an equitable transition to zero-emission vehicles. State public investments are designed to complement private investments and to address gaps and ensure equity. This includes low income, disadvantaged communities, rural access, and also small businesses and independent owner/operators.

Significant and meaningful investments by the Energy Commission, the Public Utilities Commission, CARB, CalSTA, and Caltrans to name a few have already been made. Utilities have also made significant investment in equity and access across all vehicle segments. We also see

investments from local agencies and from the federal government as has been noted, both existing investments historically and also these new opportunities.

And then the private industry has also really been stepping up, because it is good business sense to invest in the future, as the world adopts to these new technologies.

Let me talk a little bit about our statewide Zero-Emission Vehicle Infrastructure Plan, or ZIP. This is a concise document, which describes and complements infrastructure planning efforts already underway and it relies on a data-driven approach. It is -- excuse me. It is an examination of on-site infrastructure but also grid readiness. We are on our way to deploying infrastructure at all levels, and we do not anticipate infrastructure being a barrier to our State goals with the sound investments we have been making and plan to make.

There is work to be done and we need to continue that work, but it is not insurmountable. Regulations and public investments can in fact send an important signal and encourage additional private investment. I want to note that the ZIP was developed through extensive cross-agency collaboration and public outreach. And many efforts feed into the ZIP, including planning and modeling efforts. I'll discuss a few including AB 2127, Senate

Bill 1000, and Senate Bill 643.

AB 2127 directed the Energy Commission to conduct a statewide assessment of the EV infrastructure needed to support five million ZEVs by 2030. We actually used eight million ZEVs by 2030 as our base case. Our inaugural report was released in 2021 and we plan to update it every two years. And we've already begun work on the second report.

The Energy Commission has deep modeling expertise and we seek to refine with each iteration. And we examine through this report both the light-duty Passenger vehicle infrastructure that we need as well as the medium-duty, heavy-duty truck and bus infrastructure. The Energy Commission analysis finds that we need to continue our scale-up in charging infrastructure to meet our goals for 2030.

But again, it is achievable with strategic investments and it's achievable under several different scenarios, including the new investments that have been proposed by this year's State budget, which will help accelerate and create broader access.

On the light-duty side, we estimate that we need 1.2 million light-duty chargers, and that was to support eight million vehicles. I want to note that that is a more aggressive scenario than ACC II. On the medium-duty,

heavy-duty side, an additional 160,000 chargers are needed by 2030. And we're starting our second phase of modeling through the HEVI-LOAD model. And we're committed to ongoing refinement and analysis as that Market matures as well.

With good planning, these vehicles will be good citizens of the grid. Some, but not all load, will be flexible load and respond to grid signals and rate design. This is one of many strategies to integrate the new load, including bi-directional functionality to create on-site resiliency, integration of solar and stationary storage, and State agencies are considering impacts of distributed energy resource proceedings across the board, knowing that no one size fits all.

Senate Bill 1000 is the examination of equity across three metrics, another report we did. This looks at population density, geographic distribution to ensure rural access, and also population income level, including low, middle, and high. And this analysis will inform our investments to target and remake our -- our investments and to address gaps.

And then Senate Bill 643 directs the Energy Commission to prepare a statewide assessment of hydrogen fuel cell electric vehicle infrastructure and hydrogen fuel production. We will continue to examine fuel

production, distribution, and infrastructure to meet our goals. Additionally, there is these Sustainable Freight Action plan, also a multi-agency effort and Senate Bill 671, which established a Clean Freight Corridor efficiency assessment.

Next, let me talk about grid readiness. I know it's an interesting topic for a lot of folks. Grid resiliency and reliability and core components of our mission. And it is also a multi-agency planning effort. A lot of proactive work is being done and we continue to refine and improve in this area too, including the addition of a high electrification scenario in our 2021 IEPR.

The transition to zero-emission vehicles is not expected to create a new systemwide peak. We will see new distribution circuit peaks, which we'll actively address. We do not expect a new systemwide peak. The State has advanced electric system planning processes and electric demand forecasting capabilities. The State agencies actively coordinate and collaborate on system planning. And again, this includes the Energy Commission's IEPR, which includes an energy demand forecast; CAISO transmission planning; and PUC integrated resource planning. And we continue to add new capacity to the grid where it is needed. In fact, we include -- we added

approximately 2,000 megawatts of new battery storage resourced to the grid within the last year.

Finally, let me talk a little bit about our funding solicitation. The Energy Commission has invested over $1 billion towards transportation through the end of last year, and we're accelerating our investments. We will deploy at least another 1.2 billion in the coming years. And with these -- with this year's proposed budget, we'd add another two billion on top of that. And this is on top of the other Investments you've heard about today, including from the Public Utility Commission and other agencies.

We continue to build on successful existing programs and create new ones to target gaps. We leverage private investments through match funding requirements and will invest where the private market may not otherwise invest. We rely on a public stakeholder process and outreach to inform these investments.

On the light-duty side, we target our investments for disadvantaged communities, rural communities, low income and multi-unit dwellings, such as apartments. We use federal and State funding to create a strong network of high-powered fast chargers along travel corridors and in communities, and we expect to meet our 250,000 charger goal by 2025.

With this year's budget, we'll add funding and deploy towards our 2030 goals as well, all while supporting the private market and their investments. Specific solicitations include BESTFIT, which focused on innovative solutions. We funded a new solicitation for high-mileage vehicles, including Lyft, Uber and others. We launched a rural communities solicitation to deploy chargers in rural communities, and launched a multi-family housing solicitation to deploy chargers to support apartments, condos, and renters. And that is on top of launching several large block grants for broad and rapid deployment across all segments. Additionally, we've made significant investments in hydrogen fueling stations on our way to 200 stations to support 290,000 fuel cell vehicles.

Similarly on the medium-duty, heavy-duty side, we make broad investments to support the full range of trucks and buses, including retail charging stations open to the public and also those at depot behind a fence line. Our flagship program EnergIIZE is a block grant program, the nation's first statewide program for zero-emission vehicles. And this complements the investments made through HVIP. This supports both electric and hydrogen. And again, this will fund publicly available retail stations, as well as those dedicated behind the fence for

depot infrastructure. We support rural communities and those vehicles that do not return to base every night. And this will support independent owner/operators as well.

HVIP and EnergIIZE have a common implementer and are very much coordinated across the vehicle and infrastructure segments. A few solicitations in this segment include a drayage truck solicitation, which was done jointly between CARB and the Energy Commission to fund vehicles and infrastructure, both electric and hydrogen. We also had a zero-emission transit fleet infrastructure solicitation, which had a focused funding category for small fleets in rural areas. We have funded planning grants for ports and for fleets to plan for a hundred percent ZEV future. And we continue to advance our efforts for medium-duty, heavy-duty and coordinate with CARB to target gaps.

These investments put us in an excellent position to reach our zero-emission operations for both passenger vehicles and trucks and buses. State agencies will continue to collaborate and coordinate to support individuals, fleets, and California businesses. And this is all anchored by significant infrastructure investments by State agencies coupled with private investments.

In conclusion our goals are achievable. Thank you and I'll hand it back to Analisa.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Thank you, Hannon. I'd like to round out our panel today with a few next steps.

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MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: As mentioned, the Board will hear several regulations in the coming year that will need supporting fueling infrastructure for market success and, in some cases, have regulatory provisions directly supporting infrastructure implementation. I hope this presentation demonstrates the level of coordination taking place across agencies and programs. Clearly, continued tight coordination is needed, especially in our planning and our funding programs.

As our workgroup meetings demonstrated, bringing stakeholders together is valuable. We commit -- committed to continuing the dialogue between parties with a solutions orientation. And we look forward to tracking our progress in developing needed infrastructure across sectors and throughout the ZEV market development. I hope today's presentations also demonstrate the agency's clear commitment and focus to establishing successful zero-emission infrastructure.

I've been working in the ZEV space for about 25 years and I'm deeply encouraged by the level of

cooperation between agencies that I see happening now. We have today, thanks to the Governor's Executive Order, the SIP strategy, the scoping document, the ZEV market development strategy document, and the energy planning documents a shared vision to reach the State's ZEV goals and priorities.

We look forward to continuing these efforts together. And this concludes our presentation and we look forward to answering the Board's questions and to discussion.

Thank you.

CHAIR RANDOLPH: Okay. Thank you for that great presentation. We will now hear from the public who signed up to speak on this item, either by submitting a request to speak card or by their raised hand in Zoom. So I will ask the Board clerks to get started on calling the commenters.

BOARD CLERK ESTABROOK: Yes. Thank you, Chair.

I will be calling on the commenters who have raised their hands in Zoom and Clerk Lindsay Garcia will call on those of you who have signed up to speak here in the room.

We currently have six commenters a with their hands raised to speak on this item in Zoom. If you wish to speak verbally on this item, please make sure you raise

your hand or dial star nine in Zoom. I apologize in advance if I mispronounce your name. And I would like to remind all commenters to please speak slowly and clearly for our interpreters and court reporter.

The first three commenters are Kristian Corby, Nick Blair, and Kevin Maggay.

Kristian, you can unmute and begin.

KRISTIAN CORBY: Good morning. Hi. My name is Kristian Corby and I am the Deputy Executive Director at the California Electric Transportation Coalition.

First, I want to thank the CARB Board and all of the agencies present today. This is exactly the conversation that we need to be having right now and these are the challenges that we face -- infrastructure challenges we face to reach our goals.

My comments today are going to focus on the medium- and heavy-duty ZEV infrastructure side. As we all now the ZEV -- ZEV trucks and infrastructure are in their very early stages of market development. And we need all of the tools available right now to help our transition to our transportation system, both vehicle and infrastructure incentives and a forward-looking planning process that helps identify locations for early infrastructure investment.

I strongly recommend that CARB continue the

Advanced Clean Fleets infrastructure meetings. They've been a very valuable forum for fleets and other stakeholders to discuss concerns and challenges. And I think as the regulation progresses, it will be an even more valuable resource and forum.

So to give a quick sense of a couple of the cutting-edge examples of medium- and heavy-duty infrastructure installations right now, Southern California Edison in partnership with EPRI and CALSTART received a RHETTA grant from the CEC to develop two demo sites for high-powered truck charging. They were awarded $13 million and they were -- they're going to install two sites, one near the ports of Long Beach and LA and another in Ontario. And the RHETTA project is a very promising step forward and shows that the technical specifications and site designs, especially for high-powered -- high-powered public truck charging are still in development.

So another example would be from private industry that's moving forward quite well is WattEV, they've created a truck as a service business model and are currently installing charging depots for medium- and heavy-duty trucks that are planned to open at the end of this year.

So for public charging, we can see that the

market is progressing, but still in a very nascent stage. And one of the things we need to identify are locations that are low to no risk for infrastructure deployment. Places that there's already a lot of truck traffic or parking and public charging will ultimately be a necessity there.

The West Coast Clean Transit Corridor Initiative and the California Regional Charging Network that was put together by the California utilities just the beginning of this year are both initiatives that are working on this issue. Public charging for trucks is developing. But clearly the fastest to electrify fleets will be those that can install their own infrastructure and operate a return-to-base style of charging. These entities will normally be well capitalized and own their property where their trucks park, which as we learned --

BOARD CLERK ESTABROOK: Thank you.

KRISTIAN CORBY: -- meeting was --

BOARD CLERK ESTABROOK: That concludes your time.

KRISTIAN CORBY: So I just want to -- yes, thank you very much. Thank you very much for your time. Appreciate it.

BOARD CLERK ESTABROOK: Thank you.

Next will be Nick Blair. Nick, you can unmute and begin.

NICK BLAIR: Good morning, Board members. I'm Nick Blair with the Association of California Water Agencies representing 460 public water agencies throughout Southern California and delivering approximately 90 percent of water to California for domestic, agricultural, and industrial uses.

We appreciate the opportunity to comment today and have been active participants in the Advanced Clean Fleet Rule as well as others such as the CTC's ZEV Infrastructure Plan. I'll start by saying we appreciate the many dialogue opportunities we've had so far with agency staff and also with CARB Board members. I'm talking about the development of the Advanced Clean Fleets Rule and. We appreciate meetings like this where the various State agencies are working in tandem on the different efforts.

I do agree with Kristian Corby the continuing work group efforts on the Advanced Clean Fleets Rule is very good for dialogue between staff and stakeholders.

I'll be brief in my comments. Going back to Analisa Bevan's noted stakeholder concerns just to give a little flavor from ACWA's perspective, we have concern with charging infrastructure availability to meet medium- and heavy-duty fleet needs that require -- for duty cycles that require 12-, 16-, to 24-hour days. Initial

assessments by our members show that the capabilities of vehicles still raise concerns at this point as far as sizing and installing infrastructure. And duty cycles are case specific by agency, so there is no one-size-fits-all. So we will continue to provide input on that.

Also, we have concern about the cost of public water agencies to -- for starting up -- putting in infrastructure. The discussion on charging infrastructure has focused mainly on publicly accessible stations, but we want to continue the conversation on the needed start for public agencies to ensure that our operational demands are met throughout our service territories.

And thirdly, as noted in the presentation, grid reliability is a big -- is a big concern for us and the ability to charge essential public fleets is a consideration we have during PSPS events and during normal times. We want to be sure that the electric grid can meet the need -- meet the needs of our fleets as well as all of California's fleets as we continue to electrify. So I'll leave it at that.

Thank you for the opportunity to talk today. We will absolutely continue to partake in these conversations with comment letters, scheduling additional Board member meetings, and look forward to continued dialogue.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speak will be Kevin Maggay. After Kevin, will be Morgan Caswell, Leela Rao, and Marc Geller, and then we will turn to some commenters in the room. Kevin, you can unmute and begin.

KEVIN MAGGAY: Hi. Can you guys hear me?

BOARD CLERK ESTABROOK: Yes, we can.

KEVIN MAGGAY: Thank you.

Good morning, Chair Randolph, Vice Chair Berg, and Board members. My name is Kevin Maggay. I'm with Navistar International. Navistar is one of the largest truck manufacturers in the country that sells international brand Class 4 through 6 commercial trucks, IC brand school and commercial buses. The company is based in Lisle, Illinois and has more than 11,000 employees at our facilities throughout North America. My comments are specific to the medium- and heavy-duty sector.

Navistar was actually one of the first heavy-duty truck manufacturers to develop and deploy an all-electric delivery commercial van, the eStar, in 2009. Maybe that was a little bit head of its time. Today, Navistar is focused both on battery and fuel cell electric commercial vehicles. Navistar has commercial offerings and we are currently selling battery electric school buses and all

electric EV series medium-duty trucks to customers.

Also, Navistar and GM announced at partnership to develop and manufacture fuel cell Class 8 on-highway trucks for market by 2024. Navistar is -- fully supports the transition to a zero-emission future. But in order to properly transition, we all know that infrastructure is integral, but it also remains the largest hurdle for us to overcome. And I'm sure you already know and others will bring up all the challenges in just building out the infrastructure, so I won't get into that, but I do want to stress the timing of deployment and the urgency of deployment.

OEMs have requirements through the Advanced Clean Truck Regulation to sell zero-emission trucks, the Advanced Clean Fleet Regulation, which will soon be considered by the Board will -- would require fleets to purchase trucks. The deployment of infrastructure needs to keep pace with the vehicle deployment requirements in these regulations.

In fact, I think infrastructure deployment needs to exceed the pace of vehicle regulations. I think the infrastructure, needs to come first. This needs to give truck users some piece of mind that they can charge, while they're doing their job.

We announced our -- we're confident in our

products, just as a -- as I'm sure other OEMs area, but very concerned with the infrastructure, because the ultimate success of our products will rely on infrastructure. And we're very concerned with the near-term term availability of both private and public charging.

As, yes, we need to focus on immediate near-term rollout of infrastructure because there are immediate near-term requirements and users that -- as I mentioned. There's not enough sufficient infrastructure, users can't do their job, and quite frankly it makes electric trucks look bad, if they can't know where to charge. This is especially true for vocations like drayage that rely almost exclusively on public fueling or charging and have zero-emission requirements as soon as 2024, which is about a year and a half away.

We do appreciate all the efforts being made here by all the different agencies. California is clearly the leader in this space, but we don't have the luxury of only looking 5, 10 15, 20 years out anymore. We need to take things farther and faster, and we hope that the agencies on the panel can collectively and quickly develop and implement mechanisms to accelerate the immediate deployment of charging.

With zero-emission requirements right around the

corner, I feel that we're already behind on medium- and heavy-duty infrastructure and we need action and we need deployment now.

So thank you and we look forward to working with you on this urgent issue.

BOARD CLERK ESTABROOK: Thank you.

Next is Morgan Caswell. Morgan, you can unmute and begin.

MORGAN CASWELL: Great. Thank you. Good morning. I want to thank, you know, the California Air Resources Board for this opportunity to provide public comment. My name is Morgan Caswell and I am the Manager of Air Quality Practices at the Port of Long Beach.

We appreciate the actions the State is taking to address the substantial challenges infrastructure poses to successfully transition light-, medium, and heavy-duty vehicles to zero emission. I'd like to focus my comments on the importance of prioritizing funds for public charging to serve the drayage truck industry. The draft Advanced Clean Fleets Regulation as written proposes a new requirement that any new drayage trucks entering the State Truck Registry must be zero emission starting in 2024.

However, there are only a handful of planned public charging stations near the San Pedro Bay ports, based on our Public Trust charging and fueling studies

that was published late last year. While there is a lot of charging infrastructure funding that will become available, each program that administers grant funds will have different requirements. Private investment in the buildout of public charging infrastructure will be critical as well as the support of public subsidies.

Grant programs should allow these private parties to apply directly for funding, but a lot of the funding on the table today that is reference in public presentations are restricted to government entities or nonprofits and fund a variety of project types, above and beyond vehicle infrastructure.

The Port Infrastructure Development Program is a great example of a program that will be oversubscribed for not simply public charging, but also traditional infrastructure projects, such as rail and other efficiency improvements, great data exchange projects, resiliency projects, environmental projects such as shore power, clean harbor craft and zero-emission cargo handling equipment.

We need regional infrastructure now. And while government in particular will have an important role to play, a sustainable charging networker -- network can only be built if the business case makes sense to private entities long term and they need the public subsidy to

make it work in the early years.

Further, if we look at this issue through an equity lens, we can see that emission reductions from trucks is incredibly important to support attainment in the South Coast Air Basin and to improve public health. And it's also critically important that public charging, including overnight public charging, will be needed to ensure our independent owner/operators aren't left behind in this transition.

I'll conclude by asking that those entities who are still crafting requirements and priorities for public charging programs that you consider the incredible gap in public heavy-duty drayage truck charging infrastructure and the substantial impact that near-term investment in this area can have for our communities, our independent owner/operators, and the drayage truck industry at large.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Marc Geller, you can unmute and again.

MARC, are you there?

MARC GELLER: Yes, I am.

BOARD CLERK ESTABROOK: Perfect. We can hear you.

MARC GELLER: Thank you. I am Marc Geller from the EV Charging for All Coalition. We have been working

in the CALGreen Code process to achieve low power Level 2 access for a hundred percent of newly constructed units in multi-family housing with access to parking. We believe this can and should be achieved in the interim process.

Our proposal advances equity by promoting direct access from parking to etch new unit's meter and panel to assure the lowest possible utility rates just as single-family home residents have.

Multi-family housing residents, often lower income, should not pay more for electricity to charge EVs. Our proposal is achieves goals desired by builders and property managers by simplifying the code requirements for access to power for EVs in multi-family housing.

We look forward to continuing to work with CARB, HCD, and BSC to achieve our mutual goals of access to power at home for all in California.

There's no place like home. Thank you.

BOARD CLERK ESTABROOK: Thank you.

Okay. So with that, I will transition and pass it over to Board Clerk Lindsay Garcia to call on some of the folks here in the room.

BOARD CLERK GARCIA: Thank you. We have six in-person commenters who wish to speak at this time. And I apologize in advance if I mispronounce anyone's name.

The first in-person speaker will be Sarah

Swickard. Sarah, if you could please come up now.

SARAH SWICKARD: Good morning. My name is Sarah Swickard I'm on the Clean Transportation Team at PG&E. Thank you for the presentations, and the discussion today, and the opportunity to provide some comments.

PG&E strongly supports State policies and CARB regulations such as Advanced Clean Fleets to decarbonize the transportation sector. As was discussed earlier, we have made significant progress in the state, but we still have a long way to go to meet the State's goals, especially when it comes to infrastructure in light of the complexity and time it takes to deploy. This is an all-hands-on-deck effort.

The recent ACF infrastructure workshops held by CARB have highlighted just how complex this transition will be and how much proactive coordination will be necessary between the State agencies, the infrastructure providers, and the customers who are transitioning their fleets.

Utilities have and will continue to play an important role in ensuring our customers can electrify their transportation needs through grid planning, rates, interconnection, educational resources, and make-ready infrastructure programs.

PG&E is preparing the grid to support our

customers who will electrify and is working closely with the various State agencies who presented today and is developing internal tools to accurately forecast where and when this EV load will appear. Additionally, we have a dedicated team in our service planning to assist customers who are seeking to install this infrastructure.

We also have utility make-ready infrastructure programs, which have been an important tool to increasing access to infrastructure in this still nascent market. Through our programs, we can provide turnkey solutions to customers who are ready to electrify but may not yet have the means.

To date, PG&E has been able to build nearly 5,000 EV charging ports at roughly 200 locations across 66 cities through its portfolio of programs and is planning on doing much more. Our current and future programs will continue to increase access to infrastructure for the very customers that CARB seeks to Transition to zero emission. These include are EV Fleet Program, which is focused on electrifying medium- and heavy-duty customers, our EV Fast Charge Program, which enables public fast charging and aims to install approximately 50 plazas of DC fast charging in a corridor and urban sites. And we have also recently proposed our EV Charge 2 Program to install 16,000 Level 2 and DC fast charging ports across PG&E's

service territory.

PG&E will also implement its five Low Carbon Fuel Standard credit revenue funded programs in support of our customers who are making this zero-emission transition. Through these programs and our efforts to provide safe, reliable, and clean electricity to our customers, PG&E is committed to continuing to support CARB's efforts to reduce emissions in the transportation sector and achieve the ambitious goals laid out by the State.

Thank you.

BOARD CLERK GARCIA: Thank you.

Next, well hear from Steve Douglas.

STEVEN DOUGLAS: Thank you. Thank you, Madam Chair. Steve Douglas. I have to say it's great to be back. I've been doing this, like Analisa, for about 25 years and this is the very first time that I actually looked forward to coming.

(Laughter.)

STEVEN DOUGLAS: So thank you for that.

Well, good morning, Chair Randolph, members of the Board. I'm Steve Douglas with the Alliance for Automotive Innovation. We represent car companies that produce about 95 percent of the new vehicles that are sold in California. Our 37 members also include the world's leading Tier 1 supplies and technology companies. Our

members are committed to electrification, to a net zero carbon future. We support virtually every word that has been said by your staff and by the other agencies here today and we sincerely appreciate their work on this.

On a global scale, automakers will spend about $515 billion on electrification by the end of this decade. Last year, more than 70 electrified models were available, and that includes battery, plug-in hybrid, fuel cell electric vehicles.

Finally, we're starting to see EVs in the most important vehicle segment in our industry and probably for the country in pickup trucks. This is a new world and we're pleased to see the Board is looking beyond technology feasibility, which has been your foray and looking more at market feasibility with presentations like today on EV infrastructure.

In virtually every aspect, market feasibility -- technology feasibility is taking a back seat to the market. Simple concepts like affordability have to be analyzed through the market feasibility lens. Is a $20,000 new car or used car, is that affordable. It's not if you can't fuel it or if you have to spend an hour or two away from home every week to do so.

Last month, Kelley Blue Book reported that the average transaction -- transaction price on an electric

vehicle was $65,977. This suggests that the current market is predominantly driven by affluent buyers with ready access to safe, reliable, low-cost charging at home. That's where the charging is done.

Ready access to affordable and reliable electric charging and hydrogen network, allowing customers to fuel at or near their home where they work and where they play is critical for all communities and it's critical for market feasibility.

Again, we applaud the work of this Board, its staff, and all of the agencies here today. We commit to continuing our work together and look forward to building an EV market.

Thank you.

BOARD CLERK GARCIA: Thank you.

Next we'll hear from Anja Raudabaugh.

ANJA RAUDABAUGH: Good morning. My name is Anja Raudabaugh. I'm the CEO of Western United Dairies. Of the approximate thousand dairies left in California, I have the privilege and pleasure to represent 900 of them.

I wanted to dovetail on the comments today. Our members are extremely excited about this electrified future. I wanted to speak not just about leakage, which gets a lot of attention in the business community, but about local investment.

Two-thirds of the dairies that have taken incentivized grants to reduce their methane are not only doubling down with their private sector investments, but they have matched the cost share in order to bill long-term electrified infrastructure. This is something I think is really important with the perspective of this Board. We're in it with you and we want to be good partners.

The continued support of dairy methane incentives by the State will result in faster results while maintaining local food supplies. And that local investment that our farmers are making and doubling down on, we're really excited about that renewable future and with the electrification of our heavy-duty fleets looks like. So like I said, about two-thirds of dairies plan to electrify their heavy-duty fleet and they are making those investments now on their own dime to do so.

Thank you for the time today.

BOARD CLERK GARCIA: Thank you.

Next, we'll hear from Evan Edgar.

EVAN EDGAR: Chair -- Chair and Board members, my name is Evan Edgar. I'm an engineer for Edgar Associates, and we support SB 1383, RNG and, a circular economy.

And we don't have any leakage when it comes to diverting organics in the landfill and making RNG

in-state, and organic compost. There's no export or import. We're all localized.

RNG is in-state and we're carbon negative as defined by CARB. Our facilities are net zero greenhouse gases as defined by CARB. We're near zero NOx and we're zero pesticide with organic compost. And they're all based upon zero waste principles. But I'm not here on behalf of dairy. I'm a carbon cowboy. And what we do, we take a lot of compost and put it on the ranches and throughout California to sequester carbon.

As part of our 10-year, 20-year process to get off diesel, we do a lot of life-cycle assessments. I'm an engineer and do a lot of LCAs, and I believe that's the crux of the Low Carbon Fuel Standard. For pesticides, you hear about that nowadays, as well as for batteries. Right now, we are supporting -- the EU has adopted a resolution in order to have three points of their battery directive in order to have equity within technology.

And one of them is -- the first one is sourcing. You've got to responsibly source your cobalt, your lithium, and your nickel. And according to Amnesty International and the UN, there's a lot of slave child labor going in Congo right now. I talked to the EJ three times about this, yesterday again. And so far, nobody has responded for anything in writing. And these are credible

sources and references about sourcing. The EU has stepped up and I believe that California should adopt a European battery directive.

Number two has to do with the LCA, the carbon intensity of ZEVs. Let's say you use electricity alone on a California grid is plus 24. They're not 0. It's plus 24 today and will be till 2045. They'll never be zero till 2045. Plus in manufacturing, basin upon the EU studies, are plus 40 to plus 60. And this was the European Union studies and that's what they're doing in Europe. We're turning a blind eye. Zero-emission vehicles are not zero. We keep on saying that. It's a lie. It's disingenuous. It's complicit. You're misinforming the public. Zero-emission vehicles are not zero.

And then another -- the third part is the end of life. You've got to have the end of life with regards to recycling these batteries. This is a proven four-year process in the European Union. California needs to adopt it now, because the fact that you're not telling the truth about zero-emission vehicles. And in the near-term what we're doing is working today. We're carbon negative today. We're taking RNG and it's a near term solution. You only have seven to eight years left, according to the UN IPPC to bend the climate curve. Everybody is, from

Biden to all the doctors saying methane is number one. And the short-lived climate pollutants is being left out of your AB 32 Scoping Plan study. Instead it's all ZEV all the time and forcing my industry to stay on diesel.

Thirteen years of diesel, because you chilled out the RNG market and now we're staying on diesel for 13 to 18 years.

Thank you.

BOARD CLERK GARCIA: Thank you.

Next will hear from Mikhael Skvarla.

MIKHAEL SKVARLA: Good morning. Good to be in 3-D.

(Laughter.)

MIKHAEL SKVARLA: Mikhael Skvarla here on behalf of the California Hydrogen Coalition. I want to express our appreciation to staff and everyone participating this morning. We're here to serve as a resource against the fear, uncertainty, and doubt when it comes to hydrogen and fuel cell electric vehicles in all weight classes. The more -- mobile source strategy that the ARB has developed in conjunction with the preliminary modeling for the Scoping Plan all indicate the need for millions of fuel cell electric vehicles in all weight classes.

However, infrastructure is not keeping up with the pace that's necessary for us to achieve our 2035 and

2045 goals. We often hear that we've outlaid enough funds for the 200 stations in the light-duty space to get us to 250,000, as the Mobile Source Strategy has indicated, vehicles. However, our goals for 2030 go well beyond that Executive Order from Governor Brown.

We have in this year's budget, last year's budget, and the proposed three-year budget cycle from the Governor enough funds to bring light-duty hydrogen to self sufficiency today. We have enough funds to create a statewide network of heavy-duty hydrogen stations to fill up to 70,000 heavy-duty trucks throughout the State today. We have enough to fund all of the transit infrastructure necessary for the transit districts that want to adopt hydrogen today.

And that doesn't cut into the underlying budget necessary for charging. SB 100 has given the utilities a great rate-basing authority to help serve that market. Hydrogen is only funded through the Clean Transportation Program, which should be author -- reauthorized either later this year or next year with a guarantee that we will build statewide networks for both charging and hydrogen. There is a necessary need to get the infrastructure in the ground. I think we have embraced that vision for the charging community. We need to embrace that vision for fuel cell and hydrogen community.

We are offering renewable fuel. There are seven announced hydrogen production projects. All of those renewable in the state of California, none of them funded with public dollars.

Hydrogen self-sufficiency is achievable in this decade, if we continue to push. So to that end, we're here as a resource. We want to be helpful and we want to bring the zero-emission future as soon as possible.

Thank you

BOARD CLERK GARCIA: Thank you.

And finally, we will hear from Aravind Kailas.

ARAVIND KAILAS: Happy Thursday, everybody. It's so good to be here in person. And I'll start off by thanking the California Air Resources Board for convening this very, very important meeting. Very timely discussion. Thank you for the opportunity to provide public comments. My name is Aravind Kailas and I'm the Advanced Technology Policy Director for Volvo Group North America. Volvo Group is a global provider of transport and infrastructure solutions. In North America, we are the maker of Volvo trucks and Mack trucks in the heavy-duty Sector. We also make Nova and -- Nova buses in the transit sector and Prevost Coach commute -- commuter coaches. We also have Volvo construction equipment and then power solutions for the commercial and marine

sectors.

Sustainability is part of Volvo Group's DNA. So I'm proud to say that we're committed to the transition to zero-emission vehicles. The good news is we're already doing it all across the world. And I'm proud again to say that we're doing it in California. As a matter of fact, we started in California. So kudos to the California climate leaders. We were fortunate to take advantage of a number of State agency programs, including CARB's ZANZEFF Program, which resulted in Volvo LIGHTS, which I'm sure many of you have heard and been a part of.

Next, I'd like to thank the State agencies. And I see a lot of familiar faces. Kudos to the work that you're doing. I love this enriching information that you provided this morning. This is very important that you continue the work. Analisa, I've been part of your CARB working group for ACF and I think we need to continue those discussions. Very, very important.

As part of my comments, what I would like to offer for consideration is we heard a lot about the funding that California is investing. California is definitely an example not just for the U.S. but for the rest of the world in terms of putting money where its mouth is at. However, it's not just about throwing money at the problem. As I have brought up in several different

forums, we need to make sure that the infrastructure is built out in a timely manner. We have been putting trucks within 6 to 10 months, but then we have had to wait for infrastructure to be powered on and we're talking about 250 kilowatt chargers being powered on for 14 to 18 months.

Long story short, there are some laws in place, like AB 1236 and AB 970. That's a great start, but a law is not equivalent to enforcement. So we need to work together to get this enforced. There's a liable -- AB 2700, we need things like that to happen to make sure that the energization, the interconnection processes are done in a timely manner and there's transparency that is provided to the OEMs and to the fleets. My fleets, my customers want to do this. We want to do this together, but we also want to do it the right way.

So as a closing remark, I'd like to offer that Aravind and Volvo Group is here to be part of the solution set. Once again, thank you so much for the opportunity to provide public comments.

BOARD CLERK GARCIA: Thank you. And that concludes the in-person commenters for this item. And I will turn it back over to Katie

CHAIR RANDOLPH: I think Board Member Kracov might have a comment.

BOARD MEMBER KRACOV: I was just going to say Mr. Kailas, I've probably met you 10 times. You're a very active participant in the South Coast with JETSI Program. This is the first time, even though we've done tours and spent probably hours together, that I've actually seen your face. So good to see you.

(Laughter.)

BOARD CLERK ESTABROOK: All right. Now, we will hear from the remaining five speakers who have raised their hands in Zoom. First will be Lisa McGhee, then Chris King, Priscilla Rodriguez, Sara Fitzsimon, and Bill Elrick.

Lisa, you can unmute and begin.

LISA McGHEE: Hi. This is Lisa McGhee. I'm wearing two hats. I'm with San Diego Airport Parking Company as their former Operations Manager and still participate and manage all of their electrification. They have two pilot projects that they developed with San Diego Gas and Electric. I also am the business development manager for GreenPower Motor Company.

I want to say thank you very much to CARB's deeper engagement with stakeholders that you recently took as it relates to the collaboration and development of Medium- and Heavy-Duty Working Group. This was something very necessary and a step in the right direction. It

really has an opportunity to improve the comprehension and share the real-world lessons learned. So thank you very much. I did participate in each of the panels and want to thank Lisa[SIC] and CARB, and greatly appreciate the process and recommend to continue taking these types of deeper dives.

My comments will emphasize the medium- and heavy-duty and small- and medium-sized fleets that are private entities. Eighty-five percent of the population of medium- and heavy-duty truck and bus drivers are made up from private sectors and small- and medium-sized fleets. The small- and medium-sized private fleets will face the biggest challenges to meet the ZEV mandate. Your HVIP Program and the current EnergIIZE Jump Start lanes are examples that need to continue and are even more necessary due to the looming mandates.

The DAC and set-aside funding and projects have been prioritizing primarily only DACs. We need sustained process for small and private fleets, including for vehicle and charging rebates. My concerns include the gap and hardships the small and private fleets face. Lower utilization of charging will equate to higher rate averages when demand fees are included. Public charging rates can be twice the amount as a separately metered EV commercial innovative rate.

The medium- and heavy-duty public stations do not support large vehicles, including cable links, high tour, higher AC Level 2 outputs. We could have shared hubs by large entities, which could increase utilization and could be incentivized to share with local small operators.

Overall, the real-world experience with this technology averages a 50 percent baseline savings and averages another 50 percent in maintenance. I've experienced this at San Diego Airport Parking. This adds reliability, this adds up-time. Everything fleets require. The technology holds many promises and early adoption needs to prioritize small fleets and our dealerships that already have these medium- and heavy-duty relationships.

I want to continue and -- this advocacy work that started in 2016 and really appreciate CARB's support and want to announce that California -- that San Diego Airport Parking Company is 100 percent ZEV compliant today and it couldn't have been done without the funding rebate.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Chris King, you can unmute and begin.

CHRIS KING: Thank you. My name is Chris King. I'm Senior Vice President of Strategic Partnerships with Siemens Mobility. Siemens provides EV charging hardware

and software, including manufacturing in California. And we're on record to manufacture one million EV chargers by 2025. As a corporation, we were among the first globally to commit to net zero carbon emissions by 2030. We're already halfway there and that includes electrifying our 11,000 vehicle fleet.

I'm going to talk about three specific topics. This first one is building codes. We support the requirement for new construction to install EV chargers or charging plugs. However, our recommendation is that all the plugs be capable of both 110 volts and 220 volts, so that all of those locations could support Level 2 charging.

There's strong evidence that Level 2 charging is needed for a successful EV charging experience for EV drivers. UC Davis found that 20 percent of EV owners actually switched back to ICE vehicles. And of those, 70 percent were relying on Level 1 chargers. One driver said if you don't have a Level 2, it's almost impossible. JD Power found that satisfaction with charging speed is 35 percent lower among owners of Level 1 chargers than among owners of Level 2 chargers, and only 57 percent of EV drivers using Level 1 chargers were satisfied.

The second topic is real-time data for public chargers and this applies to all types of vehicles. A

critical driver of EV adoption is a (inaudible) experience. And as mentioned by another speaker, it should be as easy to fuel an EV as an ICE vehicle. Reliability is a huge issue with one in four public chargers found not working in their recent study.

(Inaudible) the best consumer experience EV chargers need real-time date on whether chargers are working, whether they're occupied, what type of connector they have, what charging space is available, and what the price is. This could be easily accomplished by requiring the company to (inaudible) probably (inaudible) the chargers if available in ACI, for use by ACI developers to provide (inaudible) drivers in real-time as needed to find those charging stations.

Tesla already does this. It provides this real-time data and has achieved high customer satisfaction ratings for this capability.

And finally, all publicly-funded chargers should use open standards. Open standards protect customer choice by preventing vendor lock-ins, reduce costs through increased competition, and they also minimize the risk of stranded assets, and we've actually Seen examples of stranded assets.

We applaud the progress that the agencies have made and thank you for the opportunity

BOARD CLERK ESTABROOK: Thank you.

Next is Priscilla Rodriguez. Priscilla, you can unmute and begin.

PRISCILLA RODRIGUEZ: Good morning, Madam Chair, members of the Board. My name is Priscilla Rodriguez, Assistant Vice President of California Cotton Ginners and Growers Association and Western Agricultural Processors Association, representing the cotton industry and hullers and processors of walnuts, almonds, pistachios, and pecans.

We appreciate that opportunity to provide public comments today. We understand we are responsible for creating clean air. We know we are part of the problem and want to be part of the solution. This was displayed when we worked with the air district, CARB, PUC and others for the deployment of AG-ICE to convert thousands of diesel-powered irrigation pumps over to electric pumps.

During this time, we were faced with challenges. Those challenges persist today, and include concerns over infrastructure that simply weren't sufficient in rural areas, where our members are located.

We saw many issues with utility substation deficiencies during the implementation of AG-ICE, where there simply wasn't enough capacity. In addition to that, it would cost hundreds of thousands to millions to

upgrade, consequently many areas that did not get converted for that simple reason. We had concerns with the necessary infrastructure at our members' facilities, especially older facilities where a large number of charging stations may need to be insolve -- installed.

One example is an almond processor that wants to replace 31 propane forklifts with electric, so PG&E told them they would have to drop another service and transformer into the facility and it would cost anywhere above $750,000.

In addition to -- in addition, the timing to install new infrastructure is significant. Utility companies are anywhere out from 12 to 18 months out to come into that service. Compliance dates are around the corner and we are concerned the onus will be on our members when they are tied down by its disability, availability, and time to install infrastructure.

Again, I want to reiterate we want to be part of the solution and have members who have already converted part of their fleets over to electric where it's feasible. Going forward, we want to make sure that there is a plan for agricul -- agricultural operations we represent.

We look forward to working with CARB staff as we progress in this process. Thank you.

BOARD CLERK ESTABROOK: Thank you.

Sara Fitzsimon, you can unmute and begin.

SARA FITZSIMON: Hi. Thank you. Sara Fitzsimon from the California Hydrogen Business Council. The California Hydrogen Business Council represent around 135 members who are working on the commercialization of hydrogen across the energy and transportation sectors. For my comments today, I do want to just focus on the ZEV market development strategy update given by Tyson Eckerle fro GO-Biz. Thank you for having me today to comment on this presentation and for holding this Board meeting, so that we can publicly comment.

Tyson, you did a great job in your overview. It's been wonderful getting to work with GO-Biz on these efforts to decarbonize our transportation sector. I would like to note that when we're tracking the progress of our ZEV market, it's really important that we maintain equity across all of our technologies. Fuel cell electric vehicles are wonderful vehicles. I can say this, because I drive one myself, a Honda Clarity fuel cell.

They're great for Californians, because they have a short fueling time, they have long range, they're very reliable, and they're zero-emission. Much of the fuel that fuel cell electric vehicles use, the hydrogen is around 90 percent or higher renewable, due to the LCFS Program. And it's been a great system that we've been

developing here in California, but it is too slow of progress in order to reach our goals for transportation coming up.

So in looking at the budget that was presented in this ZEV market snapshot, in passenger vehicles and big ZEVs, it's really important that we allocate those budget funds with parity as it relates to battery-electric vehicles as well. There are so many benefits to a fuel cell electric vehicle, especially for someone going from a gas vehicle to a cleaner vehicle, fuel cells are the easiest transition.

California can't reach these goals on one technology alone. It's really important that we diversify our options and give Californians an option to choose a type of car that works for them. Many people can't charge at home. Many people don't have the time to charge at home and having these hydrogen fuel cell vehicles available for those who don't have those options and who need long range is really important.

So when looking at these funds, I would just request that we analyze them in a way that relates to equity and also with parity across the technologies. I think hydrogen can really serve our state well and there's a lot of excitement and progress behind this sector, a lot of companies willing to do the work, and to work with the

State on this to make sure that this sector grows.

So thank you for your time and your consideration of these comments. I would like to also note that I second the comments of Mr. Skvarla earlier talking about the details on which we can advance our funding and push for more opportunities for the hydrogen space and tech -- in this sector.

Thank you.

BOARD CLERK ESTABROOK: Thank. And our final commenter for this item is Bill Elrick. Bill, you can unmute and begin.

BILL ELRICK: Great. Thank you. As you said, my name is Bill Elrick. I'm the Executive Director at the California Fuel Cell Partnership. Thank you for the opportunity today. I want to start by applauding all the hard work CARB and all the agencies are doing on ZEVs. It's really appreciated and important work.

Analisa's comments let's start with. The ZEV infrastructure is not just critical, it's essential for ZEV deployment, and to reach California's aggressive climate and air quality objectives. Also noted was that infrastructure cannot be a barrier to ZEV adoption. And while some note the development of an entirely knew hydrogen infrastructure is challenging, CARB appropriately stated that this is the opportunity to build a ZEV

ecosystem from the ground up with equity and accessibility in mind.

To that, light-duty fuel cell vehicles have global interoperability already and single station can support hundreds of drivers and thus one station can support multiple MuDs in supporting equitable accessibility. Furthermore, we can design hydrogen infrastructure to complement the electrical grid and BEV deployment with increased renewable penetration and providing increased grid resilience and durability.

California regulations have always been technology agnostic focusing on the objectives of 100 percent ZEV adoption in reaching our climate goals, yet the language around ZEVs is not always reflecting this. For example today, the heavy-duty discussion we heard clearly the need to support all technologies that advance our objectives. Yet, we do not hear the same language when discussing light-duty ZEV objectives.

This agno -- agnostic approach and verbal language is as essential as the needed infrastructure, as it send clear signals to private and federal investment, which is especially important now considering the billions of federal hydrogen hub and private investment announcements coming out lately.

Related, Tyson highlighted the need for hydrogen

to preference financially self-sufficient outcomes, which should frankly be asked of of all State ZEV and technology investments. Yet, I heard nothing about CARB's recent light-duty hydrogen self-sufficiency report. This was identified as the first pathway to achieve a ZEV mandate and the objective of a self-sustaining ZEV market for light-duty hydrogen vehicles this decade with modest continued State support. It was not mentioned today, and that, along with the 200 station objective that is currently on the books, doesn't fulfill or doesn't have fulfill the hundred ZEV -- hundred percent ZEV adoption objective.

Generally, this should be integrated into all ZEV planning, as this should be considered and leaned into aggressively especially with many State and national public-private roadmaps and strategies available.

Related, our -- oh, I'll just end with the absence of winning strategies and support for hydrogen across all applications endangers California's ability to meet 100 percent ZEV and our environmental objectives. So stronger consideration for all ZEV technologies now, so we can get the infrastructure in place in time is essential. So thanks for all the hard work here. Let's not miss this opportunity.

BOARD CLERK ESTABROOK: Thank you.

Chair, that concludes the commenters for this item.

CHAIR RANDOLPH: All right. Thank you very much for the presentation and public comment on this informational item. I will now turn it to Board members for questions and comments.

And I see Dr. Sperling.

BOARD MEMBER SPERLING: First, I want to thank all of you that came here and spent the morning with us. Appreciate it just for the time and investment, but also all your efforts working with each other and with CARB.

I would summarize the discussion as there's three key issues. It's availability, it's cost, and reliability. I want to focus on that third one reliability. So this has been kind of a Kumbaya discussion this morning and I'll let it go. There's lots of money coming and I'll let others talk about how -- how that's going to translate into real -- the kind of infrastructure we need and timeliness, but I want to focus on reliability.

So the CARB tech review that we're going to hear more about says that 90 -- that there's uptime of 95 to 98 percent. Well, we all know that's wrong, and that's self-reported, and there's ways of contorting data. And so I'm not accusing anyone of lying, but there are ways of

twisting data to come up with numbers that you like, speaking as a researcher.

You know, for instance, there was a study done that I think some of you know about at UC Berkeley that found that -- they actually went around to each charger, each fast charger, and tried to make it work, see if it would work. And they found that 27 percent did not work. And that even of the remaining, they had challenges in terms of using their credit card in paying.

So the question here, it's mostly targeted to Mr. Rasool from the Energy Commission, because they're the obvious leader on this. But I also would like this for Tyson Eckerle, because he's been working on this for many years.

So the question is what are we going to do to assure reliability? Now, I know there's lots of reasons why we're not getting the reliability, but I want -- and -- I want to hear an answer in terms of accountability and in terms of performance. You know, if we're going to give all this public -- these billions and billions of dollars, we should be getting accountability, and we should be getting performance, and we're not, and -- to date.

So what are we going to do different going forward? And that, I think, mostly has to do with how do

we condition the money we handout. I hope there's some good answers.

HANNON RASOOL: Thank you for the question and it's a great one. So we're actually starting to do a lot in this space. We've heard the same reports and anecdotal evidence as well of that. So we really want to put some numbers behind it. We held a workshop in March to do a few different things, get some stakeholder engagement, but also let's define reliability. As you noted, there's a lot of different ways to define it, a lot of different things that can happen.

So we want to define reliability and then start measuring it. As part of our grant funding solicitations, we've started requiring a 97 percent minimum uptime and we're also starting to fund maintenance plans as well for it. So definitely hear you on that. Feel the same way that public funds need to go towards reliable infrastructure, and we're starting to make inroads in that.

BOARD MEMBER SPERLING: Okay. You know, I will comment that just imposing a uptime requirement, at first well as we heard, you know, the metrics on how you calculate is important, but it's also -- there's so many different players. You know, you've got the utility, you've got the equipment. You know, no one -- almost none

of these are owned and operated by one company and so everyone blames someone else.

So I hope you're going to be more sophisticated about it than the short answer you just gave, but -- so I'm -- yeah, I'll leave it at that. Thank you. And maybe Tyson has some insights.

TYSON ECKERLE: I mean, I think you -- your -- this is a very hard question to answer, because of all the parties, and because of all the potential failure points. You know, so we've had -- we've seen it on EV charging, I think we've all -- who drive it have personally experienced the issues when you show up to a charger and it's not working. We've had it on the hydrogen fueling side as well. It was -- we had supply issues and we have equipment issues.

And so I think really, you know, we're starting with just getting a clear handle on the actual problem, where those failure points are. And I think the hard part is within the system, you know, it -- there is a lot of finger pointing that can happen, and it can be upstream at the utility. It could be upstream at the hydrogen supply point. But I think the best thing -- you know, I think where the Energy Commission is, you know, showing some good leadership is starting to collect that data. And I think your point is really well taken, you know, what is

that self-reporting, what does it look like? Because the anecdotal experience is really what drives, you know, kind of the feeling of the market.

I will point out too, you know, it looks like -- like the Tesla network, for example, I think people are generally pretty happy with. And so how do we replicate that? They also have a more simple network. You just plug it in and go. And so -- so it's not a satisfying answer, but I think that what is it -- like, we are going to be laser focused on this this year, because it -- and just taking a step back on the ZEV market development strategy, what our focus is for this coming year, it's really on the end user and the end user experience from the fleet perspective and passenger perspective, and this is right in that sweet spot.

BOARD MEMBER SPERLING: Yeah. You know, I would comment on the Tesla experience is that it's vertically integrated. They have a motivation to keep it up, and they do. These others don't. And that's why it's so critical for us as providers of public funding to figure out how to hold these different parties accountable.

And so -- and I want to thank Analisa Bevan for the whole report for high -- she highlighted, you know, the importance -- I mean, with all the stakeholder -- the stakeholders analysis was what's most important,

reliability. And if we're going to get to a hundred percent or 68 percent and all of our steps along the way, this has got to be solved.

Thanks.

CHAIR RANDOLPH: Okay. Supervisor Vargas.

BOARD MEMBER VARGAS: Thank you. Thank you for all of your presentations. And I just -- I heard many of you speak and use the word equity. And so I just wanted to make sure that there's a clarification. Is there a consensus of what -- how everybody -- how you all define equity? I know it's -- everybody is using it. So I just want to better understand how -- how we're defining equity in this context and then what are the determinants to make sure that we're successful as we're defining it.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Do we have folks who want to start with that? It might make sense to start with CEC.

HANNON RASOOL: Sure. Thank you. Right now, we're defining equity as low-income communities and also disadvantaged communities, and seek to align with the CARB definitions of those as well. Right now, at least 50 percent of our investments through our investment plan will go towards low-income and disadvantaged communities.

Right now, we do it based upon a locational factor, so where is the charging station or hydrogen

station located. We're actually kicking off a process to further define it and say who is actually benefiting investments. It's one thing to say it's located somewhere. It's another thing to look at who is benefiting from it.

So portfolio-wide we're looking at a 50 percent minimum. And then on our EnergIIZE Program, which is the equivalent to HVIP, but on the infrastructure side for medium-duty, heavy-duty, our floor is 60 percent. So definitely looking to make inroads there as well.

CHAIR RANDOLPH: Supervisor Serna.

Sorry, did somebody else want to comment on that?

PAULA GRUENDLING: I could add from the CPUC point of view. So originally, the programs were focusing mainly on disadvantaged communities, which was a top 25 percent on the CalEnviroScreen. But since the passage of AB 841, that definition broadened to include what is now call in their CERP community. So it goes beyond the DACs and includes low-income communities, includes federally recognized California Indian tribes, it includes -- oh, and 75 percent of public school students in the project area that are eligible to receive free or reduced price meals under the National School Lunch Program. But we also want to -- and the -- the legislation requires that 35 percent of the resources go to those areas. We are --

near-term priorities decision, we extended that to 50 percent of budgets or infrastructure deployed to be targeting those areas.

And now we want to take it even further to include collaboration with the community-based organizations, both in the design of the programs and the deployment of the programs. So we do -- and we do acknowledge that that's a challenge, and we -- we just want to make sure that those communities are heard both in design and implementation, and then later in evaluation for us to see how the work was done.

BOARD MEMBER VARGAS: Thank you. I'm just really interested in finding out how we include in these formulas communities that have been impacted by the racial injustice of centuries of the redlining that has been impacting our communities for so many years. And so as we're moving forward making sure that those formulas are taken into account and -- as part of that process. So thank you. I appreciate it.

PAULA GRUENDLING: Thank you.

CHAIR RANDOLPH: Can I just ask a quick follow-up before I call on you Supervisor Serna, which is I think, Paula, you hit on a key point, which is it can't just be kind of a locational issue, but it's also who are you serving, right? You know, who has access to chargers and

who -- what housing types are we having to do extra work toward -- to get the chargers available, and the workplaces, and the neighborhoods, and sort of the -- the different aspects of communities, like, you know, partnering with churches and houses of worship, you know, to have charging available there, where, you know, people might congregate more. And so I think it's really important to think about kind of to the point you made about working with community-based organizations and thinking not just about location, but about, you know, how people can actually use the infrastructure.

Okay. Supervisor Serna.

BOARD MEMBER SERNA: All right. Thank you, Chair. And thank you, Supervisor Vargas, for that really important question. And it's good to hear from some of our sister agencies what that definition of equity means. And I think we can all agree that that lens is as if -- as important, if not most important, for how we move forward in terms of expanding market share for ZEVs and the infrastructure that's necessary for that expansion.

And along those lines, I think we all recognize that one of the greatest challenges when it comes to infrastructure has to do with multi-family units and the fact that it's obviously much more difficult to retrofit and perhaps even for new multi-family development to

incorporate charging infrastructure, based on the number of folks that are going to live on a given acre. It's much more Challenging obviously than the single-family context.

So I guess my question is relative to fuel cell technology, what, if anything, are we -- and when I say we, I mean all of the sister agencies here that are represented, what are we doing to actively look to the marketing, the incentives, basically everything in our toolbox to look to expand fuel cell availability, hydrogen availability as it relates directly towards multi-family dwellers, and in light of the fact that that might be a better solution than having to look to just putting charging infrastructure in, you know, garden apartments. So I don't know if anyone has any thoughts on that, but I'd be interested to hear from someone about it.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Well, on the vehicle side, fuel cell vehicles are still eligible for the CVRP rebates and part of those programs. On the station side, I wonder of Hannon could talk about how station locations are sited.

HANNON RASOOL: Yeah, certainly. So we have a number of solicitations out on hydrogen. Right now, we're funding down a list from a 2019 solicitation. Currently, we have 54 stations, and through that we should get right

around 179.

And we actually look and work with CARB on their modeling tool It looks at geographic map and using GIS mapping to see where the stations are relative to population centers. And so we're really looking to direct the market using that CARB tool, and say, you know, here's where we want to see the stations proliferate, but also want to look at the private market too. I think a lot of the developers have a good sense of where their customers are, so it's a -- it's a joint effort between the private market and how we direct the market a bit through our solicitations as well.

BOARD MEMBER SERNA: So is there any -- is there any direct partnership or common thought processes with HCD or with OPR, for instance, so that the future development of multi-family projects, you know, kind of have some sense of how to best optimize the geographic, you know, juxtaposition of where the hydrogen fuel cell -- or the hydrogen fueling stations are versus apartment complexes for instance.

HANNON RASOOL: Not that I'm aware of, but I can check with our team and see what we're doing with new builds, and specifically multi-unit dwellings as well.

BOARD MEMBER SERNA: I think that -- I think that that would be -- that's something that should be explored,

because I -- you know, again, I think we have to look at pretty creative ways to make sure that the multi-family market, if you will, is not left out of the equation when it comes to ZEV, you know, market share expansion. So hopefully, those two agencies at least are giving that some thought. And I know that we do have some representation from HCD here. I don't know if you have any thoughts, Kyle.

KYLE KRAUSE: Yeah. Thank you, Supervisor Serna.

Kyle Krause from HCD's Division of Codes and Standards. I will follow up with our Division of Financial Assistance and see what, if anything, they're doing to -- related to awards for developers building multi-family projects and working with our fellow agencies to identify the locations that are planned for those hydrogen fuel stations. We did discover early in our participation of fuel station workgroup that locating hydrogen fueling stations on multi-family dwelling properties was a significant cost barrier. So I think to your point of nearby hydrogen stations, that would be probably the most appropriate effort. So we'll respond. Thank you.

BOARD MEMBER SERNA: Great. Thank you.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: If I could follow up. Hannon's mention of our

modeling helped get some data on that. So 75 percent of the planned and funded stations are within six minutes of -- six minutes of access driving time. And access is pretty equivalent between DAC and non-DAC communities. So we have done that kind of modeling on station location both planned and funded.

TYSON ECKERLE: Maybe just -- if I could add just one thing too that in terms of getting access to low-income communities, we're excited about a new program through consumer awareness grants that Valley CAN is launching in Fresno, where Toyota donated 30 used Mirai for low-income multi-family housing residents. And so we'll, you know, be collecting data and see how their experience is. They'll be using the Harris Ranch station. But I think we're at early stages in the fuse -- in the used fuel cell market, but there's a lot of good opportunity there.

BOARD MEMBER SERNA: Thanks.

CHAIR RANDOLPH: All right.

Dr. Pacheco-Werner.

BOARD MEMBER PACHECO-WERNER: Thank you. Thank you so much to all the presenters. And I would just add on the co-location question of different technologies, also heavy-duty as well.

I have two sort of spheres of questions. One of

them really is around the streamlining of the -- the sort of bureaucracy behind putting things on the ground. And I know that no one really talked about this, but it's important to think about how we think about permitting across, and if there needs to be a legislative fix to streamline that, because it is so dependent on each jurisdiction. And when you start talking about rural, when you start talking about disadvantaged communities, you are going to see it be really, really stark difference than the places where there's already heavy infrastructure -- charging infrastructure in place.

And so I'd just like to hear folks sort of thoughts on the permitting piece. And also within that, as you talk to the charging technologies, you know, how we think about equity in terms of ensuring that our rural and most disadvantaged communities don't just get stuck with the -- with lowest level charging, because access to fast charging is also an equity issue.

And the second question is more around training and how we're thinking about training in terms of the property managers. And this is from everything from buildings to dwellings. And also how you're thinking about that from also kind of an equity lens in terms of literacy and language as well. And when we talk about the -- and I think maybe this is more to Tyson. When we

talk about, you know, the manufacturing piece, how is that being integrated into our K-16 education, so that folks in -- in these communities that we're talking about can actually be the ones working on these and this manufacturing as it expands?

Thank you.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Thanks. I will give a shout-out to Tyson and his team at GO-Biz. They have been the agency that -- as any stakeholder comes to us and explains that they're having difficulties with permitting, we ask Tyson and his team to intervene and they've been extremely successful, but I'll let me talk about what they do.

TYSON ECKERLE: Yeah. So there's a lot on permitting. We can send you the website too. So we've been -- we have two pieces of legislation that I think Aravind mentioned, but AB 1236 and AB 970, essentially fives us a scorecard. We have 540 jurisdictions in California and we just passed, I think, 186 are streamlined, but actually covers quite a bit of the population. But it's a ground game kind of -- and then, you know, people move and they -- you know, the permit officials.

And so with the partnership very -- working closely with EV charging station providers, and utilities,

and reaching out into the communities, we're actually partnering with the Energy Commission on a full-time position. We have -- we've had a full-time position on this, but it's -- or, you know, not full time. We've been kind of sharing time on all this, but a full-time position dedicated to permit streamlining for both charging and hydrogen stations.

And so oftentimes, we get asked to come in and then we just come and ask questions and help raise focus and make sure that they understand. I think this year's legislation of AB 970 puts strict timelines on the actual approval of ER charging stations, so there's a lot of optimism around that. Of course, there's, you know, the implementation matters as Aravind brought, right? There's not teeth behind, per se, but companies could, in theory, bell a station without explicit approval from a city, if they need to.

And then the other -- so there's -- there's a lot there. I'm happy to go into more -- we've learned a ton as we go, but it's a ground game of a lot of local control and just trying to get people.

But just a quick anecdote. The people we find in cities who are the most amenable are the ones who are driving zero omission vehicles already. And so if you find one of those, you're in good shape in a city. And

increasingly we're finding them, because there's more and more cars out there. So that's really encouraging.

Maybe just on the manufacturing quickly and the training. So I'll get out of my depth quickly, but the Workforce Development Board is like the highway -- high road training partnerships that have been really successful and really reaching into communities who need access the most. So we're trying to scale that up and we can -- Shrayas and Workforce Development Board could talk more about that. We also have the Employment Training Panel that helps existing employers expand their training. But there's a lot -- there's big investment there proposed in the State budget. That's hopeful.

MSCD ZERO-EMISSION INFRASTRUCTURE SPECIALIST BEVAN: Hannon, did you want to talk about the funding program that you have focused on rural applications?

HANNON RASOOL: Yeah, I'd be happy too. So in response to some of the feedback we got from stakeholders, last year we launched a number of solicitations, one was focused on rural communities. We're currently scoring those applications right now, but we expect to release a NOPA, or Notice of Proposed Award in the coming weeks. And so we're really interested to see what comes of that.

It's really important that we want to target rural communities specifically with that solicitation.

And then also the work we're doing with CalSTA and Caltrans on the federal funding will be very much focused on alternate fuel corridors, so we're looking to see how we can deploy high-powered DC fast chargers. I think the target is 150 kW each in rural communities as well.

CHAIR RANDOLPH: Okay. Thank you.

Board Member Hurt followed by Vice Chair Berg.

BOARD MEMBER HURT: Thank you, Chair. Thank you all for the presentation. Of all the things that we have to get right, infrastructure and energy stability is really critical. And access of all income levels and households is essential. We need to ensure that equitable access, and reliability, and infrastructure however is not just about making sure that there's equitable access in all communities, but also that when we're placing infrastructure, we're not entrenching further highly impacted communities by pouring what I think of the medium- and heavy-duty trucks charging all in marginalized communities.

You know, our ultimate goal is zero emissions that should be clean, cleaner air, we're better stewards of our environment, but we truly need to be thoughtful of existing community needs and proper placement, and local government being involved in that, and thinking what's happening in their general -- general plans and their

land -- land use needs, and how they're looking to the future.

I know a lot of our local agencies are kind of inn critical phases with their budgets and their economic outlook and trying to figure out how they're going to revitalize their communities.

And while it's important to have charging stations throughout our communities, where can we best place them, where are they most suited.

So, you know, I don't want there to be deserts in highly impacted communities. I don't want people to misunderstand that, but I think there needs to be a balance in coordination with local jurisdictions on a higher level, because I'm thinking once they're there, they're there. We're not pulling them out. And I also think a lot about the appropriate stakeholders in those cities, and how -- again, how are communities going to Build Back Better, how are we going to do that with them, the economic implications in communities outside of infrastructure.

And I think I heard it earlier about redline communities. They're already struggling. They're struggling to come back and from unjust environmental conditions. So in this infrastructure placement, let's ensure we don't do it again and further in a different

way.

And I do want to lift up too the local government piece. I think, as someone who wears a councilwoman hat, we need guidance to best practices and support. And if you say go to a website, I've been shown 50 million websites and plans and it's really not helpful really for small- and medium-sized cities that just don't have the staff power to get the expertise. And so I'm hoping at a State level we can figure out a way whether -- I know we have toolkits, but maybe even -- I think of Antiques Roadshow. Can we take this toolkit county to county on a roadshow of sorts bringing it to the people is what I think is most important.

And earlier, you know, one of my major question and please is continue keeping an equity lens on the work that we do, but how do we go further? How do we define more of what it is equity means? And defining is not just the who, it's how are we going to coordinate exactly equity? So it's also the what, like what's going to happen to get us to that level of equity?

And I know that's not easy. And I think we have to, without a doubt, go to the community to help us make that definition, which we all know. But every time I hear the word equity, I say, but tell me more. What does that mean? And I think we all can come up with many

definitions, but let's try to come up at least with a baseline of understanding of the who and the what.

A public speaker earlier talk about -- talked about the one-size-fits-all, and that really resonates with me. It -- there can't be. And so I'm wondering again in that equity discussion, how do we talk about rural and EJ communities? And that they're not monolithic. There are many different variations within there. And again, how do we give them support?

I have a question, believe it or not it's coming here. On the tracking progress of the ZEV market snapshot, do we have any demographics or ZIP code understanding. I identified a few years ago in the Bay Area that in our Clean Cars 4 All Program, although we're reaching lower income households, we were not linking up with Black or Latino households as expected and needed.

And I think if we don't start figuring out how to do that ASAP, there are going to be a lot of people left behind in this zero-emission future.

Thank you.

TYSON ECKERLE: So maybe to your -- the question of tracking metrics. So that -- that metric snapshot, we started with the four pillars, you know, vehicles, infrastructure, workforce, and end users. The next iteration is getting to the outcomes. You know, it's that

greenhouse gas reduction, air quality. But the hardest one to measure -- well, and jobs. But the hardest one to measure is the access, you know, like it -- because it's access to the market. And that's really what we're after. So if you have ideas too -- because you know, it's kind -- we're under -- we're operating on the principle of measuring what matters, so that we can make changes. And that -- that absolutely matters.

So we have -- you know, with the consumer awareness grants, the focus is on the communities we're trying to reach the most in a lot ways. So I think we'll learn from there. So we have Valley CAN and Veloz are our partners. But that I think is the hardest tool, you know, to actually measure, because a lot of it is that you're measuring a feeling, right? And we can -- of course, the number of Clean Cars 4 All rebates and the number of chargers.

I did want to talk a little bit too just about how we're thinking about equity coming from the budget perspective even. So the California Comeback Plan last year -- and Hannon can jump in too with some color here, but the -- it was really -- this is a gross oversimplification, but it's a blanket of ZEV infrastructure. Let's get to our 200 stations or 250,000 -- 200 hydrogen stations, 250,000 chargers.

This year's proposal on the California Blueprint Plan is to really go deep with charging infrastructure on -- in communities that need it the most. And that -- you know, so -- and, of course, the who and how you define that matters. And, you know, even the context of developing the definition of equity within the ZEV market development strategy, it's kind of kitchen sink, because of all the different directives we have from the Legislature. You know, so it's -- but at the end of the day what we're trying to do is get the money and the access to the people who need it most you know.

And I think we all have a general instinct about that, but, you know, how we talk about it matters. And so that's, you know, a huge focus across agency for all of us if it --

CHAIR RANDOLPH: And I'll just -- I'll just note, I think it's really important for us to recognize that we don't need to do this alone. There's a lot of organizations out there who are working on these issues. Like EV Noire is a good example of an organization that's really thinking deeply about how you bring Black and Brown communities into the EV revolution.

And, you know, one of the things that I've talked about with them is this notion of once you see EVs kind of in your neighborhood, you're kind of more interested and

there's that kind of word-of-mouth thing that happens.

And so thinking about it, not just through the lens of, you know, the CalEnviroScreen, but really thinking about how are we working with communities to have these vehicles be more accessible.

BOARD MEMBER HURT: Yeah. If I could just follow up really quickly. You know with this equity justice and environmental justice, we have to uplift the racial justice piece to all this and I don't hear that so much in our presentations. And I'm not quite sure how we do that with sensitivity, but also acknowledging past environmental injustices, but we have to.

I would have liked -- I've actually met with EV Noire. They would have been great in this space as one of the presenters on the panel, I think, in a discussion. I would have like to have seen local cities at the table here too, a representation from middle to small sized to hear how implementation can be successful.

It's that consciousness that I think we need to bring at the table here and a greater size than just state. I mean, I know we're at the -- at a certain level, but how it's implemented seems so important to also be understood.

CHAIR RANDOLPH: Yeah. I mean, I think one goal of this presentation was to show the cross-agency

coordination and, you know, perhaps we can do a future panel that's more about all the sort of other folks that we have to work with that are not just in State government.

Okay. Vice Chair Berg then Board Member Takvorian.

VICE CHAIR BERG: Oh, thank you very much. You know, I found this really, really inspiring, because as we're putting all these pieces together, these are the topics that really keep me up at night, literally keep me up at night, as we're looking to adopt very accelerated programs.

But I would like to continue on Board Member Hurt's elevated consciousness. I'm not sure -- in fact, I don't believe after working in a 617 community most of my adult life and having a daughter that lives in a 617 community, I don't believe that we acknowledge that we're behind now. There -- communities today are -- disadvantaged and low income communities today live in substandard infrastructure. And it's privately owned and it's difficult for us as housing agencies, as government to figure all this out, but we don't talk about it. We -- we talk about this transformation as if there is some sort of even playing ground and we're going to make sure we're going to rise all boats. And quite frankly, we have some

boats underwater and we don't talk about that. How are we going to get that to even close to an even playing field, so that we aren't leaving people behind.

And it's a huge topic. It is extremely complicated. But again, in elevating the consciousness and acknowledging, I think it really would be helpful to understand that we're behind today and how are we going to address the electricity issues that are not working in some of these communities, much less the electricity that's needed to go forward. So that -- really, I'd like to add that to the equity conversation.

And Tyson, I love your tracking. It's a snapshot. I also think it's really helpful on your market snapshot how are these jobs affecting again your outcomes just as Board Member Hurt indicated, also the benefits of the infrastructure. We're creating a lot of jobs. People are talking about it, but are we making a difference again? And so I think that would be very, very helpful.

It's very exciting we can talk about new construction, but we have an awful lot of existing construction. And I own a building, a business that is housed in a 97-year old building. And so we -- we've got to figure those things out. And as we look at future conversations, I think we've got to include what are we going to be doing retrofitting is very -- is difficult, if

not impossible, but there's got to be ways. We've got to be thinking about this, because I have employees that are going to be driving electric vehicles. I don't have on-site parking. And so -- and I have trucks, seven Class 8 trucks. And so how are going to get all this?

I still have old transformers I can't get removed off of my property. They don't do anything, but they're up there on stilts. And so really, there -- there's some big issues around this that we do have to figure out.

I think -- I do appreciate the comment that zero is not zero. I think it's time for us to acknowledge and track it, okay? We've been able to cut and bifurcate the part we want to measure. We did that for good reason. It's time to change that. So we need to start counting upstream emissions. We need to have it to be the same conversation. We're going electric. That is absolutely determined. There's no going back globally, but we need to measure correctly. And so we -- I think as a State agency, it's time for us to step up and redefine that.

And then my final comment, which we'll be hearing a little bit more on the next, I am worried about the charging business model of the private chargers. And so we rely on a great deal of public funding. And it's going to be needed over the next 10, 15 years. But what is the business model for charging? If we do all this investment

and then see that there really wasn't a sustainable business model, because as professor Sperling indicated, it was not integrated in a way to be able to cover the cost, it's going to be a real problem for government, because we're going to have a whole slough of infrastructure with nobody really owning it.

And so somebody really does need to be thinking about, especially over these next few years, what is the business model, the sustainable business model without government funding in the future?

So thanks so much and thanks really for the inspiration. All of you working together, it really is impressive and I really truly thank you for being here today and giving of your time.

CHAIR RANDOLPH: Okay. Thank you.

Board Member Takvorian.

BOARD MEMBER TAKVORIAN: Thank you. Thank you, all. I really appreciate the multi-agency collaboration that all of your presentations and all the work that you're doing together really demonstrates, and also the robust discussion of our Board. I think we are -- we're digging into this one. As you know, it really matters. And while It seems like you've covered everything, I think there's a couple things that I think are probably things you're all thinking about, but that we haven't said. And

one is, as it relates to equity, we're talking about critical public health, and we're talking about climate justice.

And so those both stem from the racial injustices that our communities have endured for decades, centuries, and so I think that that needs to be lifted up as we think about what is equity, because equity is good health to live in and to raise your family in. And so that needs to be a measurement. And certainly CalEnviroScreen gives us some framework for that, but we don't have the Department of Public Health here at the table. We don't have OEHHA here at the table. And I think those are both critical partners who could help us to understand how much more we really need to do to advance these technologies in the communities that are most impacted from many -- in many ways, but including the fact that their health is very disproportionately worth -- worse, as asthma, respiratory diseases are, you know 5, to 8, to 10 times worse in our communities.

So, you know, we need to keep that in mind as we think about, you know, where are we applying these technologies and how are they applied, as the Chair said. And I think it's critically important to measure that. It's not just, you know, our communities get two extra chargers. How does that equate to improved health in our

community? So that's -- that's one. And I -- if you have thoughts about that, it would be really helpful to hear that.

I think the other is drawing on, as we think about location, there's a -- there's a number of things to think about. And one I think is displacement and gentrification. And -- I know that it -- within CARB, we talk about that and think about that. I know the Strategic Growth Council is thinking about it related to transformative climate communities. And I think they could be a good partner at the table as well.

This is tough. Put in a few charging stations, put in a bike path, and people start to be displaced. And so again, we're having impacts on communities that I think are unintentional, but we're starting to see how that -- how that's occurring.

And I think to follow up on what I think Board Member Hurt was, in part, saying, when we talk -- we're now in a rock and a hard place again. When we think about heavy-duty charging, we absolutely want those trucks to be -- to be ZEV. But if you're going to put heavy-duty chargers in disadvantaged communities, you're increasing or perpetuating the danger that those trucks pose in and of themselves as a physical huge things. I mean, we watch kids duck semi-trucks as they're trying to get across the

street to go to school, because the truck is on the wrong street and violating the truck ordinance. Don't get me started.

So anyway, we've got to think about that as well. It's -- it's not necessarily equitable to put another heavy-duty charger in the same community, even if it's for a ZEV truck. Appreciate the reduction in pollution, but not the increase in danger. So -- so that's obviously something we all need to focus on.

On the -- on the multi-family side, I wanted to echo Supervisor Serna's thoughts and wonder if perhaps the SOMAH, the Solar on Multifamily Affordable Housing, Project might offer some lessons. I work with Environmental Health Coalition San Diego. We are one of the CBOs that's reaching out. It's been super challenging to be reaching out and trying to put solar on older affordable housing. And I know that some of those same challenges exist for infra -- for charging infrastructure. So I wonder if there's some things we could learn from them.

And then the last one, and, Tyson, I think you started to address this. But I do wonder about the push for fast charging, which I know is really important, and how that's going to play in disadvantaged communities, where we're pushing for the secondary market, and are we

going to leave people out because of the chargers not being compatible with the cars. And I think you had started to reference that, so I'd be very interested in hearing more about that.

And see, you just stimulate -- stimulated all these conversations, so I hope you're inspired by all of our -- all our -- all of our comments and questions as well, and not discouraged. It's a lot to think about. We're remaking the combustion market really.

Thank you.

TYSON ECKERLE: Maybe just to jump in. No. Thank you for your -- very much for your comments. And health is -- absolutely underscores everything we're doing. And you often to think of -- you know, we almost take it for granted somehow, you know, the strength of the Air Resources Board and the health type of thing, you know? So it's good to restate that.

I think on the infrastructure thing, I'd actually like to have Hannon jump in on that, especially for the -- you know, the fast charging Level 2 and a lot of the analysis they are doing, like through SB 1000, is really looking at that core question. So maybe I'll stop and let you jump in, Hannon.

HANNON RASOOL: Yeah. Thank you. That's right. According to Senate Bill 1000, we issued the first report

about a year and a half ago. The next one should come out hopefully in a month or two. And we're finding, exactly as you said, it's disproportionally put -- put out there in the world, both in terms of equity, so low-income has the fewest number of chargers. I think intuitively we probably unfortunately all could have guessed that. But we have the data and analysis to support that as well.

Also, in rural communities, it's a longer drive time for rural communities to get to a DC fast charger. So part of our strategy is to ensure that we have minimum requirements in our solicitations, be it for MuD solicitation -- oh, sorry, multi-unit dwelling solicitation, rural solicitation, NEVI as well on the federal side, so we want to have minimum standards across the Board to make sure that we're not inadvertently saying this charger is okay for this community, but these other ones get this type of charger. Like, that is not an outcome anyone wants.

And I apologize. I think there was a last part to your -- to your question there that I may not be answering.

BOARD MEMBER TAKVORIAN: The compatibility with --

HANNON RASOOL: Oh, yes.

BOARD MEMBER TAKVORIAN: -- the secondary market.

HANNON RASOOL: Yeah. That's great. Thank you. We are seeing that more and more of the market is moving towards CCS and so we're going to hold a workshop as part of our next block grant being stood up and really see, you know, what should we be funding by way of the physical connector. That's one part of it and so we're moving more and more towards CCS. That's where the market is headed to quite honestly.

But then also communication. We do not want to fund things that only operate for one type of vehicle and one type of charging company. So we're moving more and more towards communication standards, like OCPP and ISO 15118, which create somewhat of a baseline across infrastructure and vehicles. And we don't say that needs to be used for everything. We're saying that needs to be available. And so there is that common baseline across the board.

Now, if vehicle manufacturers want to use telematics or some other things for some other types of communication or added features, they're certainly able to do that, but we do want to look at both the physical connection between the vehicle and the charger and also that communication piece as well, so we're looking into that quite a bit.

BOARD MEMBER TAKVORIAN: So are you saying that

with the -- with the technology that you're looking at, that the charge -- the fast chargers would be accessible to older cars older ZEV cars?

HANNON RASOOL: We want to move in that direction. There's going to be some vehicles that are on the road today and that will be used vehicles in the future that won't necessarily have that already. You know, they're already on the road. And so there is that limitation in what we do going forward.

Certainly want to bring that full community forward with us, that vehicle population, but we -- we just quite honestly know there will be some limitations based on what was put out in the world, you know, five, six, seven years ago.

BOARD MEMBER TAKVORIAN: Yeah, my 2012 Bolt does not work with those. And I think that's a shame, because it's -- because I think we've talked a lot in this space about the secondary market and the importance of that market to -- to lower income communities. So maybe more work to do in that space.

Thank you.

CHAIR RANDOLPH: Yeah, I would -- I would agree with that. I actually had that experience with -- with your boss Chair Hochschild when we were driving back in his Bolt, and -- you know, and we found a Level 2 charger

no problem, but, you know, it was an old -- it was a vehicle that didn't have the connector for the DC fast charging, so we needed to make the -- go through the extra effort of finding a Level 2 charger. So we want to make sure that we have those opportunities available as we're thinking about a robust secondary market.

Okay. That was a great discussion. Really informative.

Okay. So what we're going to do is, since it's getting to be the noon hour and we have a scheduled short closed session for the Board, we will be doing a 30-minute break and then we will come back for our next agenda item at 12:20.

All right. Thank you very much.

(Off record: 11:50 a.m.)

(Thereupon the meeting recessed into closed session.)

(Thereupon a lunch break was taken.)

AFTERNOON SESSION

(Thereupon the meeting reconvened open session.)

(On record: 12:26 p.m.)

CHAIR RANDOLPH: All right. Thank you very much. The meeting of the California Air Resources Board is now back in session.

The Board met in closed session to confer with legal counsel and no action was taken.

All right. Our next agenda item is, and it's the last agen -- item on our agenda today, 22-6-2, an informational update on the Electric Vehicle Supply Equipment, or EVSE, Standards Technology Review. If you're here with us in the room and wish to comment on this item, please fill out a request to speak card as soon as possible and submit it to a Board assistant. If you are joining us remotely and wish to comment on this item, click the raise hand button or dial star nine now, and you will get into the queue. We will call on both in-person and remote commenters when we get to the public comment portion of this item.

In 2019, the Board adopted the EVSE standards regulation in response to Senate Bill 454 by Senator Corbett, which recognized the need to ensure broad open access to public charging stations for all drivers.

At the time, the dominant business model employed by the electric vehicle charging providers required membership in that company's network, which limited driver's access to charging stations and payment options.

CARB's EVSE Standards Regulation sets minimum standards for charging stations, including requirements for payment methods the chargers must accept in order to ensure that the drivers will have confidence that they can easily use public chargers.

This standards regulation is not just about today's EV drivers, it's also about tomorrow's drivers as we are transitioning to a hundred percent zero-emission vehicles. So we need to be thinking about a broad and rapidly growing consumer market, and ensuring that consumers have confident access to these chargers.

The technology review that we hear today is one step in CARB's ongoing efforts to monitor and ultimately improve access to public charging. And it focuses on attempting to better understand consumer's experiences accessing chargers with a particular focus on the methods available and utilized to pay for charging which was the subject of significant debate at the time the regulation was adopted.

Mr. Corey, would you please introduce this item?

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair.

And as you noted, as the State accelerates the transition of zero-emission transportation, it becomes increasingly urgent to expand the availability of and access to electric vehicle chargers as was discussed earlier as well. The EVSE Standards Regulation facilitates access to public charging and supports the growing market for ZEVs by establishing minimum requirements for payment methods electric vehicle charging stations must accept, facilitating roaming agreements between electric vehicle service providers, creates a more complete database of location and pricing information for consumer use, and requires notification of all fees associated with the charging session.

With respect to payment methods specifically, the regulation requires that chargers allow drives to pay using insertable, chip-enabled cards, which was the most ubiquitous card technology in use at the time the regulation was adopted, as well as mobile payments like using your phone.

In implementing this regulation and in response to Board direction, staff continue to evaluate barriers to charging access and whether the requirements of the regulation, particularly the requirements of payment methods, remain appropriate. To that end, staff conducted a technology review to assess current barriers that

drivers face in using EV charging stations and to better understand the state of the market with regard to payment options for accessing charging.

Today, we'll hear the findings from that review as well as the next steps as we continue to work toward ensuring the broadest possible access and use of public EV charging.

With that, I'll ask Stephanie Palmer of the Sustainable Transportation and Community Division to give the staff presentation.

Stephanie.

(Thereupon a slide presentation.)

STCD AIR RESOURCES ENGINEER PALMER: Thank you, Mr. Corey. Good morning, Chair Randolph and members of the Board. I'm here today to present the update on the technology review staff conducted as part of implementing CARB's Electric Vehicle Supply Equipment Standards Regulation.

I will start by providing background on the EVSE Standards Regulation and the impetus for the technology review.

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STCD AIR RESOURCES ENGINEER PALMER: Then I will discuss the process we followed for conducting the review and our key findings. Finally, I will present the next

steps we intend to take to continue monitoring implementation of the regulation and to deepen our understanding of issues related to access to charging a with focus on payment methods that consumer have access to and use.

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STCD AIR RESOURCES ENGINEER PALMER: As you heard in the previous presentation, California's need for plug-in electric vehicle infrastructure is well recognized and the State is taking many actions to build out fueling and charging infrastructure to support the growing number of zero emission vehicles on the road.

Today, there have been over a million in cumulative ZEV sales to date and there are more than 79,000 public charging stations and 54 hydrogen stations in operation.

In June, you will hear staff's Advanced Clean Cars II proposal to increase the sale of passenger ZEVs, which aims to hit Governor Newsom's target of a hundred percent ZEV sales of new cars being zero-emission by 2035.

Under this proposal, in 2030, staff project having 5.7 million ZEVs and plug-in electric hybrid vehicles in California's roads and is estimated that 714,000 chargers and over 200 hydrogen stations will be needed to support these vehicles.

With the ZEV market moving fast, it is imperative to facilitate consumer access and use of this infrastructure. The overarching goal of the EVSE Standards Regulation is to reduce the barriers that drivers, both today's drivers and tomorrow's, face when accessing public charging.

Let's talk more about the history of the regulation.

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STCD AIR RESOURCES ENGINEER PALMER: To address barriers to accessing and paying for charging, in 2013, the California Legislature passed Senate Bill 454, the Electric Vehicle Charging Station's Open Access Act. One problem the legislation intended to solve was the requirement imposed by charging companies that a driver must have a membership to access that company's charging network. Membership meant that a driver could only pay for charging using an RFID card or mobile app issued by the company provided the driver had a bank card on file or by calling a 1-800 number to confirm the driver's membership status and provide their bank card information.

To become a member, the driver may have to do one or more of the following: register with a cell phone number, email address, credit or debit, agree to be assessed a monthly fee, have funds reserved on a credit

card by the charging company and load a set amount of funds into the membership account, which may auto reload. This system limited who could access which public charging stations and made it confusing to drivers.

Pursuant to SB 454, staff developed the EVSE Standards Regulation with the goal of reducing these and other barriers to charging. To facilitate the broad use of ZEVs, it is important that drivers have confidence that they will be able to use and pay for charging with the card that they have in their wallet. The system must be simple and reliable.

Starting in 2017, CARB staff worked with stakeholders for nearly two years to develop the regulation, including determining which payment methods were the most broadly available. Public workshops and webinars were held in May 2018 through April 2019 to discuss regulatory concepts and proposed requirements. In June 2019, the Board adopted the EVSE Standards Regulation, which became effective on July 1st of 2020.

I will now turn to discuss some of the major requirements of the regulation.

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STCD AIR RESOURCES ENGINEER PALMER: This regulation has many parts, but the three highlighted here have the most impact on a driver's ability to access

stations. The operators of the charging stations have to report charging station location information to the National Renewable Energy Laboratory Alternative Fuels Data Center. The purpose of this requirement is to provide drivers a single place to locate where they will be able to charge. All fees associated with the public charging session must be displayed, so drivers can clearly see what they will be paying for before they start a charge session. This includes any parking fees or non-membership plug-in fees at the station.

Lastly, the charging station must be equipped with a reader that supports both mobile payment options and the EMV chip-enabled payment cards. Mobile phone payments are supported by readers often referred to as tap or contactless. The purpose of this requirement is to ensure drivers are able to pay for a charging session with familiar methods the use frequently in their everyday lives.

At the time the regulation was adopted, EMV Chip was the most ubiquitous card technology in the U.S. market. With respect to the compliance dates for the payment card reader, all new DC fast charge stations that become operational after January 1, 2022 must be compliant with the payment hardware either on the charging station or a kiosk that may serve a bank of chargers.

All new Level 2 that become operational after July 1, 2023 must be compliant with the payment hardware either on the charging station or a kiosk. By the compliance deadline for Level 2, charging companies will have had four years to design and manufacture stations that meet the requirements of the regulation.

In response to stakeholders during the 2019 process, the charging stations that exist prior to the two compliance dates will need to become compliant no later than July 1, 2033. This date allows the existing hardware to live at its useful life. If the station gets replaced for any reason prior to 2033, it will need to become compliant at that time.

As part of the regulatory development process in 2019, staff completed a standardized regulatory impact assessment to better understand the economic impacts of the requirements staff is proposing. As part of that report, staff estimated that compliant payment hardware would cost $370 with an annual maintenance visit costing round $270. These costs reflect the combined cost of both the EMV chip and mobile payment technologies, not just the chip reader.

Staff continue to track the cost of payment systems and recent new data suggests the marginal savings of removing the EMV chip portion of the hardware may only

stave around $70 per unit. That is roughly 1.1 percent of a Level 2 and 0.14 percent of the DCFC unit cost.

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STCD AIR RESOURCES ENGINEER PALMER: I will not turn to the technology review itself and discuss the questions we sought to address, the methods we used, key findings from the review, and our next steps based off of those findings.

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STCD AIR RESOURCES ENGINEER PALMER: Staff committed to monitoring the charging station market with a particular emphasis on the payment hardware and card market to understand if the program requirements continue to be appropriate. Based on Board direction in the fall, we expanded our work to look more bodily at barriers that drivers face when accessing charging systems including reliability.

This slide covers the questions that we sought to answer through the technology review: what barriers do drivers experience when using charging stations; what prompts their calls to customer service, to what extent do drivers experience inoperable charging stations, to what extent chip and contactless cards available and used by drivers, what payment methods are in use on charging stations.

Along with the above topics, staff sought to understand more deeply the needs of under and unbanked drivers and what payment methods assist in providing access to these groups.

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STCD AIR RESOURCES ENGINEER PALMER: Staff kicked off the technology review in October of 2020 with a public webinar. This webinar asked for public feedback on the topics that staff were proposing to cover as part of the technology review. We also incorporated input from the Board in October of 2021 to address a broader array of barriers, including reliability of charging stations.

Along with the webinar, staff engaged with parties in informal meetings throughout late 2020 and 2021. Staff also conducted a literature and data review on Federal Deposit Insurance Corporation reports, such as the study, how America banks, household use of banking in financial services, as well as other financial industry reports about banking.

Lastly, staff conducted surveys of electric vehicle service providers, credit card companies, and of drivers. Eight of 11 EVSPs responded to the survey with varying levels of completeness. The goal of the survey was to learn what current payment technologies are supported on stations, status of roaming agreements,

consumer payment preferences for existing payment options, transaction fees, network reliability metrics, and response time for downed charging stations.

Two credit card companies responded to the survey, but did not provide direct answers to those survey questions. The objective of the survey was to hear directly from the credit card companies on the deployment of tap cards in California, potential barriers to issuing tap cards, and when they expect to reach 100 percent market penetration.

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STCD AIR RESOURCES ENGINEER PALMER: The objective of the driver survey was to hear directly from drivers about the barriers they are experiencing, understand what payment methods they have and use, network membership status, customer service interactions, and sociodemographic data. This survey was distributed via social media and email lists from various groups.

The driver survey has a total of 1,290 respondents, 1,175 of which were from California. There are three categories of drivers who responded. This included 761 respondents who are plug-in electric vehicle drivers who use public charging, 259 PEV drivers who do not use public charging, and 155 non-PEV drivers. Of the 1,175 California respondents, 483 had an annual household

income of less than $50,000, which is 41 percent of total California respondents.

It is important to note that because the distribution methods focused primarily on those related to electric vehicles, respondents to this survey are not necessarily representative of the California population. For example, 65 percent of the respondents from California are electric vehicle drivers, whereas only about two percent of vehicles on the road today are ZEVs.

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STCD AIR RESOURCES ENGINEER PALMER: Let's talk about the results of this work. This slide summarizes the key findings culminating -- culminating from staff's stakeholder engagement, literature review, and surveys. Inoperable stations and payment issues are the most significant barriers to drivers. Membership requirements may be a perceived barrier for drivers in accessing chargers. Multiple payment methods exist, but most EVSPs rely on tap.

Tap-enabled cards represent a small segment of the cards in-use today nationally, but deployment is accelerating. Tap has the potential to expand payment options for un- and underbanked drivers, but barriers still remain. I will talk -- talk about each of these findings in more details on the following slides.

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STCD AIR RESOURCES ENGINEER PALMER: The driver survey asked PEV drivers who have used public charging stations the barriers they have encountered. Thirty-two percent of responses indicated membership requirements were barrier, such as they didn't have a membership and didn't want to sign up for another membership, twenty-four percent of respondents indicated charging station operability issues was a barrier, and lastly, 12 percent of our responses indicated they had payment issues.

To better understand barriers and the use of 1-800 numbers, the driver survey also asked if PEV drivers had to contact customer service? Seventy percent of respondents indicated they called due to inoperable stations and 20 percent indicated they called due to payment issues such as there is no way to pay with a credit card, not a member of the network, and general billing issues.

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STCD AIR RESOURCES ENGINEER PALMER: The driver survey also asked PEV drivers who used public charging stations why they had created a membership account with an EVSP followed by how many memberships the driver has. Seventy-six percent of PEV drivers who used public charging stations said they had a membership and 67

percent of these said they needed a membership to access a station. Sixty-two percent of respondents have two to five memberships.

One of the key components to open access is to ensure membership with an EVSP is a choice and not a requirement to use a charging station. The driver responses are indicating that the regulatory requirements, as they stand are still needed because drivers are feeling the need to rely on one or more memberships for public charging.

Given that SB 454 and CARB's EVSE Standards Regulation prohibit requiring membership to use a station, more work is needed to understand the extent to which membership may be a real or perceived barrier for drivers. For example, was membership truly required or did the driver simply not have the right payment method to use at the station?

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STCD AIR RESOURCES ENGINEER PALMER: One question on the survey of electric vehicle service providers asked what payment options their networks support. The responses showed that while the service providers offered multiple options, including membership and non-membership options, the foundational technologies these options are based on heavily reliant on the RFID reader, which enables

the tap experience.

The dominant payment methods in use on charging stations vary somewhat between DCFC and Level 2. Based on discussions and direct experience with service providers, staff is aware that most public direct current fast chargers, DCFC, do have an EMV chip reader. In some cases, a magnetic swipe reader is also available. With Level 2 chargers, staff found that most in operation today do not have an EMV chip reader.

In short, the findings indicate that it is feasible for EVSE to enable payment by both a chip-enabled card and tap forms of payment as they are currently offered on many DCFC chargers, but that L2s rely primarily on a single reader technology, which only supports tap form of payment.

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STCD AIR RESOURCES ENGINEER PALMER: A key issue in the technology review concerns the requirement in the regulation that EVSE be equipped with a chip reader. When the Board adopted the regulation, EMV chip was the most ubiquitous form of credit card technology and tap was still emerging. To ensure drivers could confidently access chargers when they needed, it is important to ensure chargers accept the form of payment that was in their wallets. Because some charging companies did not

support the chip reader requirement and until tap technology was sufficient, staff evaluated the deployment in use of tap-enabled cards specifically.

We consulted reports from the financial services industry and surveyed credit card companies to assess the deployment of tap cards, and we surveyed drivers as to the use of these cards. Through this work, we found that tap-enabled cards are a small segment of cards today, but deployment is accelerating.

Visa reported that the market share of tap payment cards is 15 percent nationally. MasterCard estimated that their market share for tap will be 25 percent nationally in the next two years. These are the primary data points that is convincing staff that it is premature to change payment requirements given the majority of card holders are unlikely to have this card technology until the mid-2020s.

It is noted that none of the credit card companies were able to provide California specific data. However, our driver survey did provide some limited information on California drivers. I want to emphasize, that the driver survey reaches early vehicle adopters, which is not wholly representative of the tap market penetration. In the driver survey, 70 percent of drivers said they have tap cards, but half of the drivers

indicated that they do not use them. Out of 819 drivers who own tap-enabled cards, 15 percent of respondents indicated they never use the tap technology, 37 percent of respondents indicated that they only use tap payment technology when present 25 percent of the time, indicating that nearly half of the drivers do not prefer to use tap cards for their regular purchasing habits. This clearly shows that while many drivers responded that they have tap, it is not a feature that they use.

--o0o--

STCD AIR RESOURCES ENGINEER PALMER: The driver survey asked respondents to indicate their incomes so that we could evaluate whether there are any difference in access between low -- lower and higher income drivers.

With respect to access to tap-enabled cards, 79 percent of respondents with income above $50,000 reported having tap cards, while only 57 percent of respondents with income below $50,000 did. CARB lacks the detailed data on the broad distribution of tap cards among Californians generally.

The data also -- are reflective of drivers who are engaged in PEV activities and who took the time to complete the survey. Because survey respondents tended to be technology forward based on owning or interest in electric vehicles, it is possible a broader disparity

exists amongst Californians more generally. Further work will -- would be needed to explore these issues and is important to consider as PEVs move from an early market technology to mainstream use.

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STCD AIR RESOURCES ENGINEER PALMER: We also sought to understand the needs of under and unbanked individuals. Interestingly, about 15 percent of survey respondents reporting having no payment card at all. According to the household banking survey by FDIC minimum balance requirements is a key factor in keeping unbanked households unbanked.

As the banking industry has changed, peer-to-peer mobile applications offered by companies, such as Venmo and Cash App are removing barriers to traditional banking by not requiring a minimum balance. These peer-to-peer apps demonstrate the potential benefits of tap technologies but barriers remain. For example, a driver cannot pay for charging using a peer-to-peer app. Peer-to-peer companies are starting to issue cards associated with their accounts that they could use to access charging, but it is not clear how many drivers utilize this option.

In addition, peer-to-peer payment companies heavily rely on smartphones that require Internet

connectivity, which depends on cellularly -- cellular network or WiFi. While there is broad availability of smartphones that tap-enable payments in general, the results suggest that drivers with low incomes may have less access to smartphones with the capability for tap payments.

In short, while the results find that tap payment technology can expand payment options for under and unbanked drivers, further work is needed to explore how they are or could be used for paying for charging. Understanding the payment needs of lower income drivers and drivers who are un and underbanked is especially important as electric vehicles move from an early market technology to mainstream use.

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STCD AIR RESOURCES ENGINEER PALMER: The technology review does not conclude staff's work on these issues, and I will now turn to describe our next steps to continue monitoring implementation of the regulation.

Staff will continue to track -- track tap deployment of credit card companies, including the national percentage of cards deployed that are tap and the percentage of transactions that use the technology. This information will come from a company's earning's report and public reports on usage of payment technologies.

Additionally, annual reports from the service providers, as required by the regulation, will help us assess how drivers are paying for a charging session in California.

Staff will work with the California Energy Commission as they develop metrics and a process for tracking station up and downtime. Staff are in the initial stages of planning and in the meantime, staff needs may solicit reliability data from the service providers.

To deepen our understanding of low-income drivers, staff will conduct listening sessions and continue to research payment access and use for under and unbanked drivers, including availability and use of different payment options. We also have forged a partnership with Caltrans on payment technologies and access, and will be participating in a Valley CAN initiative to study how drivers pay for charging sessions.

Finally, to enhance transparency and assure you and the public remain updated on this work, staff will launch a public website reporting data from this work and provide updates to the Board that synthesize the information.

--o0o--

STCD AIR RESOURCES ENGINEER PALMER: To conclude,

the EVSE Standards Regulation is one of many programs that facilitates the transition to zero-emission vehicle future. A full transition to the zero-emission vehicles will require meeting consumers where they are in making it as easy as possible to access charging.

Ensuring chargers allow for multiple payment methods that meet -- that meets the needs of a range of drivers, including low-income drivers, will be critical to facilitating the transition. When we think about equity and access, our judgment is that it is important to ensure all Californians, not just early adopters with the latest credit card technology, can access these vehicles. And the simple truth is that tap technology, even in its most -- its most common and affluent communities will not be broadly deployed for years to come, while the cost of ensuring comparability for most cards is minimal.

Moreover, as technology rolls out, drivers need to have the confidence that they can use the most commonly available payment technology, which is the EMV chip reader at this time.

Protecting access for all will give drivers confidence in public charging and enables the State to move away from the old infrastructure at a faster pace. We will continue to monitor the availability and use of payment technologies and we will come back to the board

with amendments to the regulation when appropriate.

That concludes my presentation for today. Thank you.

CHAIR RANDOLPH: Okay. Thank you.

We will now hear from the public who signed up to speak on this item either by completing a request to speak card here in the auditorium or a raised hand on Zoom.

I will now ask the Board clerks to begin calling the public commenters.

BOARD CLERK GARCIA: Thank you. We currently have two people who wish so speak pique at -- or two in-person commenters I should say who wish so speak at this time.

The first speaker will Marc Aprea.

MARC APREA: Thank you. There we go.

Madam Chair, members of the Board, Marc Aprea. I'm here on behalf of ChargePoint. Thank you for allowing us the opportunity to testify today. We all share a common goal of getting increased access to EV charging for all Californians. And we appreciate CARB's effort to conduct the recent EV Supply Equipment technology review. And while the technology review shared some meaningful insights, we believe that it missed some industry trends and understanding of consumer behavior regarding payment methods.

We also believe the review has not taken into account the significant impact of EV chip regulation on Level 2 chargers. We are here to ask that CARB to promptly open a new rulemaking to have a third-party conduct a technology review before the end of the year and for staff to conduct further cost analysis of this regulation with updated data. Let me explain why we're making this request.

One of the reviews findings concluded that access to tap technology is not widespread. However, the review missed a key marker for the payment industry that disagrees with this finding. A 2021 study done by PULSE, a Discover Card company, found that 94 percent of all debit cards will have contactless capability by 2023. In this report, debit card issues cited contactless debit cards as their top priority.

So how fast is this transition taking place? In 2019, only 11 percent of debit cards were contactless. In 2020, that number jumped to 30 percent. Last -- 64 percent last year in 2021 and projected for 2023 again 94 percent. Debit card issuer report was not cited by the technology review, nor did the technology review make a distinction between the issuance of contactless credit cards, debit cards, and the use of peer-to-peer platforms. Now, there was a reference to peer-to-peer platforms, but

there isn't a distinction in terms of how those devices are used and by what populations.

So I want to also address that the questions by some of the members were asked in terms of how do low income individuals make their payment, that that question was not addressed completely.

More importantly, as rapid as the payment technology is evolving, CARB will not be able to keep up with the changes without periodic updates on the technology review. And while we appreciate staff's comments today, we ask that the Board open up a new rulemaking. Thank you for your time.

BOARD CLERK GARCIA: Thank yo.

Next, we'll hear from Tom Knox.

TOM KNOX: Madam Chair and Board members, thank you very much. I'm Tom Knox of Valley Clean Air Now. As part of our work with helping low-income disadvantaged community residents transition to zero-emission vehicles, we're very interested in how we can make EV charging both home and public more affordable and more available. Thanks to the GO-Biz ZEV education program, this created the opportunity to partner with the California Integrated Travel Project, or Cal-ITP, to test how we can best use a debit card for our customers to have easier access to public charging.

The idea here is to get some real-world data. This is mentioned in the staff report that there is really a lack of understanding of the mechanics of how people are most comfortable with paying for charging, which really are the barriers out there. And this project wouldn't be possible without -- we have the opportunity to speak to many of the EVSPs as we were formulating this. All were very generous with their time and input. We really learned a lot about a very complex topic here. So really appreciate the support of the EVSPs during this process.

Cal-ITP then has been working with CARB staff on how we can align with the needs mentioned in the staff report to collect more data on how customers pay for EV charging. We anticipate starting this project within the next month or two. We'll work closely with CARB staff to share findings and then incorporate their input as the project proceeds.

So we really look forward to what we're about to learn here. We think this will be an important step to addressing any of the issues brought up in the staff report, so thank you, everyone.

VICE CHAIR BERG: Mr. Knox, before you leave, great to see you.

TOM KNOX: Thank you.

VICE CHAIR BERG: You know as we're weighing what

to do now, what would your be -- advice be to this Board, given that everything is emerging. We're trying so hard to get it right. And yet, we're hearing from some of the charging providers that it's increasing costs unnecessarily. And we do know that increased costs affects most low income. So do you have a bit of wisdom, given that we still have time, the Level 2 doesn't go until summer of next year. Thoughts?

CHAIR RANDOLPH: Keeping in mind that he carefully did not say anything about that issue.

(Laughter.)

VICE CHAIR BERG: I know. I was going to put him on the spot, because you have so much knowledge. And please just feel comfortable what you can share.

TOM KNOX: Thanks, Vice Chair Berg for your leadership on this. Thanks for the opportunity. We briefed you last month as we were starting to get this -- starting to get this nailed down.

So you have put me on the spot. This is a complicated issue and there are a lot of very good points being made by all the stakeholders here. We sympathize with the need to control costs. We also sympathize with the need to make this as broadly accessible as possible. I agree with the staff report's conclusion that there's a lot of data missing here. I would say -- I mean, our

whole orientation with Valley CAN is just get out and find what works with our customers. Have a lot of conversations, have hands-on experience. I'd rather answer that question in three months, if you don't mind, but I think getting some real world feedback from customers on how they're most comfortable doing this stuff.

I really appreciate Cal-ITP's focus on the underbanked. I think that's really a key point here is the really rapid expansion of services to the underbanked through a lot of these new financial service providers is opening up a lot of things that did not seem possible a year or two. I think this is a field that's in a very fast transition. I would hate to make future rules based on past facts. And so I would recommend that study is needed, progress is needed, and I'd rather lean toward fast progress and real world results, rather than imposing conclusions now.

VICE CHAIR BERG: I really appreciate that and we do have some time, so we really do look forward to what you are going to discover and especially the conversations that are going on in the three communities that you are interacting with. So thank you so much.

TOM KNOX: Thank you.

BOARD CLERK GARCIA: Thank you.

That concludes the in-person commenters for this item. I will turn it over to Katie for our remote commenters.

BOARD CLERK ESTABROOK: Thank you. We currently have 14 people with their hands raised in zoom. If you would like to comment on this item, please raise your hand now. Our first three commenters will be Leela Rao, Gillian Gillet, Miles Muller. Leela, you can unmute and begin.

LEELA RAO: Thank you, Chair Randolph and members of the Board for the opportunity to make comments on the EVSE technology review. My name is Leela Rao and I'm with the Port of Long Beach.

The Port has previously submitted a comment letter on the draft EVSE technology review, but we would like to reiterate our comments in a letter here today. As you know, the Port aims to transition its heavy-duty drayage truck fleet to the -- to zero emissions by 2035. Achieving this ambitious goal will require a significant number of new charging stations, many of which will need to be publicly accessible to support independent owner/operators without a home base for overnight charging.

The Port is concerned that the Electric Vehicle Supply Equipment Standards Regulation could inhibit the

deployment of heavy-duty truck charging in this very nascent market, an impact that was not evaluated in the technology review. The Port strongly urges CARB to clarify whether the EVSE standards regulation applies to charging stations dedicated to heavy-duty trucks, and if so, to evaluate the regulation's potential impacts on the heavy-duty public truck charging market.

While the regulation itself does not make a distinction between EVSE intended for light-duty versus heavy-duty, the underlying statute and supporting regulatory documents exclusively reference and analyze light-duty vehicles. If the EVSE regulation applies to the heavy-duty market, the Port is concerned that its requirements could stifle much needed public charging investments in these early years of the transition.

Due to the complexity of the public charging for Heavy-duty trucks, it's expected that private fleets will be the early adoptive -- early deployers of charging infrastructure at their facilities. These fleets should be encouraged to make their charging stations publicly available, at least part of the time, to independent operators who have no access to overnight charging.

EVSE Standards Regulation requirements however may deter fleets from doing so. The reporting requirements alone would likely be sufficient to deter

private facilities from making Heavy-duty EVSE partially publicly available, notwithstanding the added cost and complexity with requiring specific payment methods that may not be the most efficient or compatible with a semi-public heavy-duty truck charging business model.

The technology review does not address the EVSE Standards Regulation's potential impacts on the heavy-duty truck market, focusing entirely on passenger car drivers. If the EVSE Standards Regulation applies universally, the Port strongly recommends that CARB analyze the potential impacts on the heavy-duty truck market in the technology review.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Gillian, you can unmute and begin.

It looks like her hand went down.

Miles, you can unmute and begin.

MILES MULLER: Good morning, Chair and members of the Board. My name is Miles Muller speaking on behalf of the Natural Resources Defense Council. I'd like to start off by thanking staff for their work on the technology review and these regulations, which are aimed at addressing a critical barrier that EV drivers in California have faced for several years.

To meet California's statewide goals of creating

a mainstream market for electric vehicles and increasing access to those vehicles for low income households and residents of disadvantaged communities, it's imperative that all drivers have convenient and reliable access to electricity as a transportation fuel where they live, work and play.

CARB's existing regulations promote reliable access by requiring stations to accept credit card payment in the forms that would most align with customer expectation and open access. Customers should be able to pay for charging at these stations just as they would at gas stations or parking meters, not resigned to alternative payment methods, which many customers still currently lack.

Staff's report find that tap-enabled cards are not widely available and they EMV chip cards will continue to be the foundation for payment transactions until tap becomes more broadly deployed. Accordingly, the report concludes that changes to the EVSE Standards Regulation are not warranted at this time. We agree with this assessment and strongly support staff's recommendation.

Most pre-paid debit cards available today still lack contactless capability and the majority of prepaid debit cards still aren't compatible with mobile wallets like Apple Pay or Google Pay.

Although the landscape of payment technology is gradually changing, unbanked and un -- unbanked and underbanked drivers relying on prepay debit cards still face barriers to paying for charging without chip card readers. CARB's existing standards and commitment to continuing to evaluate barriers for all users at public charging stations with regular updates to the Board highlighting the progress of the industry are aligned with both the present and future of customer charging needs ensuring equitable access to charging as electric vehicle adoption expands to a broader and more diverse base of drivers.

We appreciate the opportunity to comment today and look forward to working with CARB on continuing to promote the achievement of California's climate, air quality, and equity goals.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speakers will be Daniel Barad, a phone number ending in 645, and then Kristian Corby.

Daniel, you can unmute and begin.

DANIEL BARAD: Good afternoon. Daniel Barad on behalf of Sierra Club California and our 500,000 members and supporters statewide expressing support for the findings and conclusions in the staff's EVSE Standards

technology review.

To facilitate the transition away from internal combustion engines towards a zero-emission future, not only do we need to significantly expand electric vehicle charging infrastructure as we heard this morning, we also must ensure that this infrastructure is accessible. This accessibility is particularly important for low- and moderate-income Californians.

The staff report finds that tap-enabled cards are now widely available and chip-enabled cards will continue to be the foundation for payment transactions until tap-enable -- tap becomes more broadly deployed. Therefore, the report concludes that changes to the EVSE Standard Regulations are not needed at this time.

We agree with this conclusion. Most debit cards and even many credit cards are not tap enabled and Apple Pay and Google Pay are not available to everyone, nor are they compatible with all cards.

As staff is committed to do, CARB should continue to identify barriers to charging and engaging stakeholders to ensure that vehicle charging is as accessible and equitable as possible. Again, we support the findings and conclusions in this report and we believe that changing the EVSE standard regulations would not be prudent at this time.

Thank you very much.

BOARD CLERK ESTABROOK: Thank you.

Phone number ending in 645, you will hear a prompt to unmute and then I will be announcing when you have 30 seconds left and then when your time is up. Please state for your -- your name for the record and then go ahead and begin.

Phone numbering in 645, are you there?

You might need to dial star six to unmute. All right -- oh, you're unmuted now.

SVEN THESEN: This is Sven Thesen calling in. Big advocate for these charging stations. And I want to go back to what Dan Sperling said and a number of other Board members about the compliments or -- no, not compliments, just the truth around Tesla's ease of use. I have both a long-range Tesla and a Leaf. And trying to DC fast charge the Leaf, I have not yet in five years not had a problem at the station to charge the Leaf. Either something is wrong with the app, something is not working at the station, the station is down, it is incredibly difficult to fast charge the Leaf right now. So anything you guys can do to reduce the unreliability of the current networks -- non-Tesla networks - and again that's been spoken about already - would be helpful.

Simultaneously, if there's a way - again, I know

they're working on a standard - to reduce the costs of those DC fast charging stations, because we are going to need them. And when you look at the -- further, when you look at the electricity cost of a DC fast charging station - we just did a survey in SoCal - it's double -- more than double the price of electricity than you can get on a TMU rate for residential. Specifically, it's on the order of $0.45 to $0.50 per kilowatt hour, which makes the cost of fuel well in excess of gasoline. So why would you switch to more -- a more expensive fuel? And that's, you know, $0.45 to $0.50 per kilowatt hour versus a SoCal Edison rate of $0.22, if you're in a residential situation.

So we -- by eliminating the payment methods and putting it on the vehicle, or on -- simply on a app is -- hopefully will reduce the cost of those chargers and reduce -- enable them to reduce the cost. But as been said earlier, that there needs to be some better business model, because just as was repeated, Tesla has a vested interest to keep these stations in operation versus the other EVSPs that may not, unless it's actually written in there. So thank you.

I would encourage all of you to experience this. You can Turo an electric car. I would encourage you on your next long distance trip to Turo a Bolt and experience

how difficult it is to fast charge on a DCFC, and then Turo a Model 3 and you can tell the sweet difference between the two.

Thank -- and if you -- oh, because if we're advocating this dog food, then we all need to simultaneously eat the dog food.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Can you please reiterate your name for the record

SVEN THESEN: Yeah. First name is Sven, S-v-e-n. Last name is Thesen, T-h-e-s-e-n. I have the nation's first curbside charger in front of my house. I've given away over a quarter of a million miles worth of EV driving.

BOARD CLERK ESTABROOK: Thank you.

SVEN THESEN: And especially that Level 2 station has never been down.

BOARD CLERK ESTABROOK: Thanks.

Our next speakers will be Kristian Corby, Bill Magavern, and Carleen Cullen.

Kristian, you can unmute and begin.

KRISTIAN CORBY: Good afternoon. Hi. My name is Kristian Corby. And I'm the Deputy Executive Director at the California Electric Transportation Coalition. So really want to thank CARB and the CARB staff and their

hard work on this issue. This is a really good report and we support staff's findings and conclusions. And we do have a couple recommendations that we think would help inform the market going forward.

So we recommend setting up a timeline for updates to the report and the regulation. And if not a formal update, perhaps just an annual informal report on progress in the industry. For example, we should seek to align with the U.S. Department of Transportation's federal guidance that will be coming out on the NEVI funding, which should be released in May. And it's -- it is expected to include guidance on payment methods. And then we also recommend CARB specify a standard that contactless payment technology should meet to be considered widely accessible to underbanked or unbanked Californians. Providing a clear standard would give the industry a little bit of certainty on the specific end goal that CARB wants the market to work toward.

And then finally we absolutely support CARB's continued investigation into whether or not membership is a real or perceived barrier to charging. And to that end, we recommend CARB consider a universal payment option by requiring like a user interface capability with a third-party payment application, such as ParkMobile or ParkWhiz. These have been really useful applications for

municipal agencies and private parties to pay for parking venues. And we see -- we've seen these systems be able to interface very well with back-office municipalities and other -- other systems. And they're already being used in hundreds of U.S. cities. So we -- we think that could be a very viable option to kind of ease the constraints around payment options.

So I just want to thank you again for your time and effort in this report and really look forward to working with CARB and CARB staff in all our various ventures going forward.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Bill Magavern, you can unmute and begin.

BILL MAGAVERN: Thanks, Madam Chair and members. Bill Magavern with the Coalition for Clean Air. We submitted a letter along with partners in the Charge Ahead California campaign. And I'm in agreement with the comments made earlier about my colleague Miles Muller with NRDC.

We joined with NRDC and others in starting the Charge Ahead California campaign eight years ago, because we think there's a real need to democratize electric vehicles in California and to make the cleanest transportation accessible to low-income Californians and

those in disadvantaged communities, who are harmed the most by the emissions from combustion engines, but in the past have been the last to benefit from the cleanest technology. And it's for these reasons that we support the recommendations in the staff report.

We do not think there should be any membership required to charge an EV just as there's no membership required to fuel a combustion vehicles at a gas station. So we agree with the staff approach to continue evaluating barriers for all users at public charging stations and make regular updates to the Board.

And I think it's a particularly wise decision that you're partnering with Valley CAN to do some of this information gathering, because Valley CAN has many years now of experience working closely with low-income customers and helping them to get into plug-in vehicles. And their empirical and data-driven approach will very much bolster this effort.

Thank you very much.

BOARD CLERK ESTABROOK: Thank you.

Carleen Cullen, you may unmute and begin.

CARLEEN CULLEN: Yes. Good afternoon. Hi. My name is Carleen Cullen and I'm the Founder and Executive Director of Cool the Earth, a non-profit focused on carbon mitigation. I am honored to have served as Governor

Newsom's EV Policy Advisor for his Gubernatorial Campaign and applaud his bold leadership in advancing the ZEV market.

I am here today to share findings of a recent reliability study we undertook with UC Berkeley and share recommendations for solutions to meet the needs of drivers. We tested every open system DC fast charging plug in the Bay Area. Our study found that 27 percent of the 657 plugs failed to charge. Only half of the functional chargers completed payment by credit card chip in the first attempt. This conflicts with the rosy picture painted by charge providers who report uptimes of 95 to 98 percent.

Causes of 23 percent of the failures were unresponsive or unavailable screens, payment system failures, charge initiation failures, network failures or broken connectors. We performed a random evaluation of 10 percent of the stations about eight days after our first evaluation and found no overall change in functionality. We have embarked upon an additional follow-up study.

We make the following recommendations. First, the findings suggest a need for shared, precise definitions of and calculations for reliability, uptime, downtime, and excluded time. New State contracts must have both enforceable conditions and penalties for

noncompliance. There must be evaluation and verification of uptime performance by a third party. We believe the CE -- CEC should be responsible and the lead agency to develop the criteria in the contracts.

Secondly, we believe the payment methods EMV, tap, plug and charge, and mobile wallet are evolving very rapidly and recommend that a third party conduct additional technology reviews within the next six months.

Additionally, in light of the 50 percent failure of chip in the first attempt, we would recommend that CARB study why there are so many failures. It appears the payment ecosystem at the station, including back-end technology is much more complex than has been anticipated, and suggest the issue may need to be addressed by the likes of our national labs or similar entities. It is of no value to have a point-of-sale regulation in place while at the same time drivers experience frequent payment systems failures.

Lastly, we believe CARB and CEC should convene key stakeholders, including non-profits such as ours and others, that represent the driver perspective. It is imperative we have reliable infrastructure for all drivers, especially those in our low-income communities who rely heavily on these systems.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speakers will be Annabel Drayton, Jay Friedland, and Natalie Nax.

Annabel, you can unmute and begin.

ANNABEL DRAYTON: Good afternoon, Chair Randolph and members of the California Air Resources Board. My name is Annabel Drayton and I'm a Policy Associate with the Northwest Energy Coalition and I'm calling in today from Seattle, Washington.

The Northwest Energy Coalition advocates for clean, affordable, and equitable energy across the four northwest states and has been working to increase access to the benefits of various zero-emission transportation options.

I want to thank the California Air Resources Board for their leadership in establishing Electric Vehicle Supply Equipment, or EVSE Standards. These standards help ensure the most accessible payment options are made available to current and future users at public electric vehicle charging stations. The EVSE Standards are of broader importance, as California can drive the market in a manner that helps increase access, and the region is looking to California to continue leading on this issue with Washington State currently undertaking a rulemaking to adopt minimum payment method standards at

public electric vehicle charging stations.

Similar to California, it has become clear in Washington that not all residents, especially those who rely on a personal vehicle and are under or unbanked renters, high mileage drives, or live -- or folks living in multi-family housing have access to convenient, reliable, and affordable electric vehicle charging.

California's EVSE Standards are one strategy to address this issue and provide a framework for other states, like Washington, looking to support more equitable zero-emission transportation options.

The Northwest Energy Coalition supports staff's recommendation and we urge the California Air Resources Board to maintain the current EVSE Standards and uphold the foundational payment method requirements.

Thank you for your leadership and for the opportunity to comment today.

BOARD CLERK ESTABROOK: Thank you.

Jay Friedland, you can unmute and begin.

JAY FRIEDLAND: Good afternoon, Chair Randolph and ARB Board members and ARB staff. My name is Jay Friedland and I'm with Plug In America, a non-profit advocating for hundreds of thousand of EV drivers. Today, I'm representing a broad coalition, which includes EVSE manufacturers, environmental groups, and consumer

organizations. And we speak for a broader group who want to become EV drivers, especially those in underserved communities.

We were the original sponsor of SB 454 in 2013, which created the EVSE Regulation before you. We've been working on this consumer protection issue for more than a decade. All along, ARB staff has worked diligently to balance the concerns of all stakeholders.

Imagine you just purchased a used EV with the help of CARB incentives and pulled up at a charger, but found out you didn't know how much it cost or if it would take your money. And then in order to fuel you had to first download an app, call an 800 number, or join a club just to fill your car. SB 454 was created to make sure this didn't happen.

EMV card readers, credit, debit, and prepaid, are the most basic way of never leaving any driver stranded at a public charger. It's what people have in their wallets. In their recent annual report, Electrify America indicated that one-third of their transactions came via cards.

We're here today to encourage, not relitigating, the important work that ARB -- that the ARB Board and staff have accomplished. We need to first ensure open and universal access to publicly available charging stations, especially since many of them were installed with public

taxpayer fund. And second we need to consider the needs of disadvantaged communities, not all of whom possess smartphones, credit cards, or bank accounts, yet who want to buy EVs to save on their transportation costs.

As ARB staff's data shows, these underserved computers -- consumers do not yet have broad access to prepaid contactless cards and may not for a number of years. As a quick example, Social Security payments are now finally being made with prepaid EMV chip cards. They do not have tap.

Let's take a moment also to discuss reliability of the public EV charging networks. Plug In America recently surveyed 5,500 EV owners and 1,400 consumers intent on buying an EV. The number one concern of those drivers, 25 percent said broken and non-functional chargers. This wasn't caused by card readers, because most of today's chargers don't have them. EVSE hardware vendors tell us communication failures are likely the cards -- cause, like the recent 3G network shutdowns, which equally impact tap or app-based payments. We need to establish fundamental standards on EV charging reliability, if we hope to reach California's EV goals.

The regulations opponents you'll hear from today want you to believe that the cost to add card readers would place an extreme burden on them. But while other

fuel options still have card readers, EV charging needs this basic access feature. Isn't it reasonable to provide real open access meeting consumers where they are rather than where the industry says they will be?

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speakers, I'll go ahead and read off the rest of the list here today, will be Lisa McGhee, Chris King, Akash Singh, Francesca Wahl, Gillian Gillet, and Emily Saserny. Lisa, you may unmute and being.

LISA McGHEE: Hi. My name is Lisa McGhee and I'm had on behalf of GreenPower Motor Company and our medium- and heavy-duty fleet customers. Much of my EV demonstration activities include many hours and experience of public charging use.

How many of the 1.1 million chargers today support medium- and heavy-duty? How many of the 6.4 million by 2030 will support medium- and heavy-duty including the EV technology advancements, such as: higher Level 2 outputs; high voltage fast charging; wireless charging; cable length for large vehicles; app filters to support medium- and heavy-duty access, such as ingress, egress, garage, and height limits; the OEM make of a charger due to the many medium- and heavy-duty interoperability challenges that exist today and that we

need to know what is the make of the charger; public charging fleet rates with volume discounts; innovative real time and dynamic rate design integrated into public chargers.

How many of the 1,250 survey respondents were fleets? There has already been a gap. Let's not forget the commercial ZEV mandates and 85 percent of the population of the medium- and heavy-duty fleets, which are small medium-sized, private-sized fleets and drivers.

Today, public charging rates do not support medium- and heavy-duty fleets having a fuel switching benefit as per SB 1000. Interoperability medium- and heavy-duty vehicle charging issues are excessive. This type of reliability issue can be resolved. The charger and medium- and heavy-duty vehicle OEMs each need to work together to perform interoperability testing. And the charger OEMs should provide free testing to medium- and heavy-duty vehicles OEMs.

Tap card access may not have -- may not have the same respondent levels until exploring more broadly and once you consider medium- and heavy-duty fleets. I see the fleet access of broadly using RFID or tap cards.

EVSE standards and next steps. Medium- and heavy-duty fleets should develop metrics for the medium- and heavy-duty and track the fleet use. Track small in

size private fleet utilizations. This may likely end up as a larger sector that will depend primarily on public charging unless other large entities share their hubs or there is another mechanism developed.

Equity and access. There is a gap of fleet engagement and medium- and heavy-duty standards, including and specifically the small- and medium-sized fleets and private entities. The lessons of fleets need to be integrated and standards supported immediately. Standards make technology affordable and scalable for all.

Thank you for this opportunity.

BOARD CLERK ESTABROOK: Thank you.

Chris King, you may unmute and begin.

CHRIS KING: Thank you. This is Chris King with Siemens again. Siemens has been actively involved in the initial rulemaking on this topic and we participated in the workshops, provided comments, and testimony. We've remained active and we participated with staff on this technology review. We feel staff has done an excellent job of assessing this topic.

We bring the perspective of being an EVSE manufacturer as well as extensive experience globally. In Europe, open standards and open payment systems have led to more rapid EV adoptions, higher consumer satisfaction with public charging, and higher utilization of public

chargers to the benefit of those providers.

In contrast here in the U.S., public charging has been the subject of walled gardens. Only Tesla drivers can use Tesla's extensive and great network. And for other public chargers, drivers have to download multiple apps and enroll with each separate network provider to use them. These barriers have slowed EV adoption, according to multiple market surveys. Our view is that fueling EVs should be as easy as fueling ICE vehicles.

The vast majority of gasoline purchases continue to use credit cards and not require any kind of membership. Card readers also improve equity, because consumers can use credit, debit, or even prepaid cards, such as those used by Supplemental Nutritional Assistance Program recipients or Social Security as Jay was mentioning. The overall effect of card readers actually is to take down these walled gardens.

Finally, as a manufacturer, we already provide DC fast chargers with card readers, no ish there, and see no unreasonable cost increase to provide the card readers for Level 2 AC chargers. Card readers themselves cast about $400 compared to a DC fast charger cost of $20,000 or more, and even an AC charger costs that range from $2,500 to $8,000 or so.

So for these reasons, we agree with and strongly

support staff's conclusions and recommendations of -- further support the recommendation that this not be relitigated at this time. And thank you very much for the chance to comment.

BOARD CLERK ESTABROOK: Thank you.

Next is a Akash Singh. You may unmute and begin.

AKASH SINGH: Good afternoon, Madam Chair and members of the Board. Thank you so much for providing this opportunity for public comment. My name is Akash Singh and I am the Western States Policy Advocate at the Union of Concerned Scientists. I'm writing in support of the proposed requirement that EVSEs have both a credit/debit card chip EMV reader and mobile payment options.

Access to charging is critical in enabling, sustaining, and expanding transportation electrification. To ensure access, we simply must have multiple payment methods at charging stations. While a plethora of individuals have access to digital wallets, app based payment systems, and tap payment systems, not everyone has access to smartphones and/or has the capacity to use a smartphone to enable EV charging.

Using a widely available technology like card readers that are found in nearly every gasoline pump remove the barrier to access for many drivers. The

proposed requirement to have a chip reader does not preclude the use of just tap or mobile payments. It simply adds an equitable choice to accommodate more EV drivers.

In addition to increasing access, having multiple independent methods for payments means that there is simply a greater likelihood that an EVSE will be usable in the event that one or other methods are temporarily unavailable to a driver.

Chip readers are not some new or challenging technology. EVSE companies have had adequate lead time to incorporate readers, and as we look to broaden the EV market, having the simple zero friction payment methods -- method is incredibly important for access.

Thank you so much to the Board and especially the staff who put so much work behind this report. Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speaker will be Gillian Gillet. You may unmute and begin.

GILLIAN GILLET: Hello. Thanks for giving me another shot while I worked out the technology.

Chair Randolph, Vice Chair Berg, and Board members, thank you for this opportunity to comment. I'm Gillian Gillet, Program Manager of California Integrated Mobility at Caltrans.

The Integrated Travel Project, Cal-ITP provides technical assistance to State and local agencies in removing structural barriers in transportation to make travel reliable, cost effective, and inclusive.

Our focus has been on standardizing trip planning and payments. Last year, we introduced direct payments by bank cards on five transit services in California followed by procurement with the Department of General Services for all transit systems in the United States to obtain the interoperable technologies to accept contactless payments, so you can pay for transit the same way you pay for coffee.

Scores of more transit agencies are applying to do the same thing. While we've started with removing barriers in transit, in meeting with our colleagues at ARB, we offer technical assistance and our team's global payment expertise to public EV charging. So I'm here today to say on the record that Cal-ITP supports ARB's interoperability and equity focus on reducing barriers to accessing public EV charging and hopes to partner with staff on financial inclusion regarding which the State is a critical agent and catalyst of change.

Bank cards are how the vast majority of Americans pay for goods and services today. And so we agree that ensuring that Californians can pay for EV charging with

the card that is already in their wallet will ensure interoperability across EV service providers and geographies for those Californians, the same as in transit.

We are excited to work with your team on the reporting periods and the next stages of this evolving regulatory process and also hope to jointly develop recommendations that could be used to -- improving the next phase of ARB's Clean Cars for Now[SIC] and other government benefit programs.

For example, we are working with Valley CAN, Valley Clean Air Now, to test the use of reloadable contactless debit cards for low income EV drivers in the San Joaquin Valley to pay for zero-emission vehicle charging at public stations.

The goal of this and other demonstrations is to gather standardized data about how bank cards are used in paying for travel with the view of information sharing and generating policy and program recommendations to improve access to mobility and improve financial inclusion in California, which is the core issue here.

We are excited to contribute to this important process. Thank you for this opportunity and my team and I are here if you have any questions.

Thanks.

BOARD CLERK ESTABROOK: Thank you.

All right. We have two more speakers for this item and that is a phone number ending in 556 and then Susanna Sanders.

Phone number ending in 556, please state your name for the record and then you may begin.

NATALIE NAX: Good afternoon. Can you all hear me?

BOARD CLERK ESTABROOK: Yes, we can.

NATALIE NAX: Great. My name is Natalie Nax and I'm speaking on behalf of the Electric Vehicle Charging Association, also known as EVCA.

EVCA is a non-profit trade association comprised of 15 companies across the EV ecosystem dedicated to increasing EV adoption through innovation, competition, and business model inclusivity. EVCA greatly appreciates ARB's raising this issue of charger reliability. There is also a lot of activity happening on this topic already at both the federal and state levels.

First, three of our members are sponsoring legislation this year to address EV charging reliability and also the Energy Commission is conducting a robust stakeholder process to increase reliability requirements. Second, the PUC is discussing the importance of reliability requirements via filing form from PG&E and

also the Federal Highway Administration is currently developing reliability requirements for EV charging funds for all 50 states, including California. So given these existing processes, we believe that the State is taking meaningful concrete action to address this topic. And we would be happy to brief ARB Board members in more detail about these processes and incorporate their concerns and feedback into our work on this issue.

BOARD CLERK ESTABROOK: Thank you.

Our next speaker is Susanna Saunders. Susanna, you may unmute and begin --

SUSANNA SAUNDERS: Good afternoon. My name is Susanna Saunders and I want you to know that I was one of the main testers for the UC Berkeley study. So I got a really up-close look at the 27 percent failure rate for the DC fast chargers. And my -- my thoughts are that in order for this transition to happen to electric vehicles, we must have a reliable charging system. Along the way, I met many frustrated drivers and heard their stories. These standards must be enforceable with a mandatory 97 percent uptime. And my suggestion would be that there needs to be an escrow account for maintenance, which accounts for a large portion of the cost of these machines to ensure it gets done.

The cables are not long enough and that is a big

problem. I'm having to back in to reach many of the chargers and it is frightening to not want to hit a pole or a car on the opposite side of the parking lot, and having to back in. So my suggestion would be that the design needs to be so the cables can reach all the cars.

I met a older couple along the way who were trying to charge. It was hot. They couldn't read the screen. They had a Mach-E Ford. They were trying to plug in. The charge would not initiate. The husband was getting very frustrated. He started yelling at the wife. And I just thought how sad that here is this couple that has done the right thing and chosen a car that will have zero emissions and won't cause air pollution and they're having this frustrating experience and that's very common.

So I also wanted to say that I saw myself first cut cable yesterday, because I know that the copper -- so that is very expensive and something that people are going to try and steal, so that's something that needs to be start thinking about, maybe retractable cables.

And I also want to say that a large part of the failure rate is for the credit card readers. And I think we need to plan for the future where most people have smartphones that the apps work better. So my -- so that's something we need to think about in planning for the future that one thing I've learned is that the credit

cards have to go through multiple software and connection issues, and it causes a large part of the problems. And all of the charging manufacturers will tell you that the apps have a better initiation rate.

And like I said, the design of the chargers and -- must be fixed. And we must go back and fix the existing charging stations. You know I talked to many frustrated folks along the way, and this is just something that has to be fixed. The existing charging stations have to be fixed and the new ones have to have enforceable standards. They will not do it on their own and there needs to be pressure and I sincerely hope that that will happen to ensure that we transition to electric vehicles.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our final speaker is Francesca Wahl. Francesca, you may unmute and begin.

FRANCESCA WAHL: Good afternoon, Chair Randolph and members of the Board. My name is Francesca Wahl. And I'm here today on behalf of Tesla. As you may know, Tesla currently has about 270 fast charging locations with over 4,000 fast chargers in California and about 40 percent of those sites are actually located in disadvantaged communities.

We greatly appreciate staff's diligence in

undertaking the technology review. As we know, it was a very time-consuming and intensive, yet very worthwhile, effort.

We did submit brief comments on the technical review articulating our support for the review process generally, and more broadly looking at technology availability for EV charging and drivers across the state. To provide a more seamless charging experience over time, customer payment technology innovation continues to be necessary.

In our comments, we specifically focused on some technical recommendations, two of which I'll briefly discuss here. The first, which has also been articulated by other speakers today, is the need to conduct ongoing technology reviews with an emphasis on gathering additional data on the availability, as well as the usage of the various payment mechanisms, and also starting to look at distinctions potentially between fast charging use cases and applications and Level 2 charging. Each of those are related to different dwell times whenever you're sitting there for 30 to 45 minutes or several hours, and there may be some distinctions that need to be looked at in the context of the payment methods used for each technology type.

The second recommendation would be to also

evaluate an opportunity for a potential third-party assessment to ensure that the technology review or future reviews do not become overly burdensome and time consuming for staff and also to ensure additional clarity can be incorporated.

This technology review and staff's next steps, as outlined in the presentation today are great first steps in providing more insight into the payment technology, is that as you've heard from many of the speakers, there's still a lot of questions outstanding. All EV drivers need to have confidence that they will be able to use a charging station reliably across the entire state. And this has been a key principle of the design for the Tesla fast charging network. So we appreciate the opportunity to provide brief comments today and staff continued work on this issue, as it's extremely important for driving EV adoption broadly across California.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Chair, that concludes the commenters for the item.

CHAIR RANDOLPH: All right. Thank you very much. Questions or comments from Board members?

By the way, this is an informational item, so no need to officially close the record.

All right. Board Member De La Torre is first. Who else raised their hands though?

BOARD MEMBER HURT: I did.

BOARD MEMBER SPERLING: Me too.

BOARD MEMBER DE LA TORRE: Okay. Thank you, staff. Thank you for going through this yet again. You know, the data still shows what it showed before and we keep having this conversation. And the folks are complaining about it. And it's a problem in search of a, you know -- or it's a solution in search of a problem, whatever the saying is.

I'm frankly as frustrated as I've been the other times we've had this conversation. We're talking about something that may or may not exist and may or may not be an issue, et cetera, et cetera. Cost and quality are an issue. We heard it over, and over, and over again today during the public comment. Cost and quality are issues for charging. Quality meaning reliability.

That's my concern. That's what I want to be focused on. That's where we need to be expending our energies, you need to be expending our en -- your energies with our collaborators at the PUC and the other agencies that have a hand in this. So I hope that this is the last time we have this conversation for a while and we can zero in.

I know there are three others studies not done by us that are out there in the cost and quality reliability space. Staff shared those with me. I'm not going to talk about them right now, but -- but that's where we -- we need to be looking at the results of those kinds of studies and what do we do about it, because as I've said before, we're the ones who are pushing this technology. And there cannot be a situation where we're promising something and what consumers are seeing out there is very different.

So again, as many times as this thing comes up, I'm going to focus on the two things that do matter to consumers, not some inside baseball arguments by vendors.

Thank you.

CHAIR RANDOLPH: Board Member Hurt.

BOARD MEMBER HURT: Thank you, Chair. So I guess on the other side of your comments, I'm going to jump to, you know, since I've joined this Board last year, I've seen the power of CARB's policies and regulations that activity help signal or push the market in appropriate directions. And I'm curious whether this is another opportunity, a moment in time in the payment market that we can signal what is the gold standard that centers people with enhanced customer service promotion, and whether we can do this today by refining this standard.

You know, what is the most ideal and equitable accessible way? And based upon that resource -- research, how are we focusing on the under and unbanked individuals.

At the last meeting, I asked for more details around that. I still haven't seen enough. I think the survey is a great start and I'm actually really blown away at how many people with ZEVs took the survey and they have an income under $50,000 and they responded.

I'm wondering what those ZIP codes are, but, you know, the baseline is affordability and easy access. And I'm wondering, you know, peer to peer, and apps, and tap and pay, and contactless versus this chip EMV. And I know you said we've kind of already talked about this over and over, but the market is evolving and I think we have to keep talking about it. But one thing I haven't heard a lot is how are we going to bring everybody along with those who are unbanked again and underbanked.

And I think we do have some models and I'm glad folks from Caltrans called in in the public transit sector. What are they currently doing? What's working and what's not working for low-income households and the modes of travel that they use? What are the lessons that we can learn on the way that they pay to travel. And I think we already have a lot of that data in our local transportation agencies that we can look to and model.

I'm glad that we are talking about equity, but I don't know if that survey gets us there. And I hope -- I like the recommendations -- the staff recommendations to do more, but I hope that we can also take into consideration that, you know, we also don't want to waste money on unnecessary costs, even though it may be not very much to put in an E -- a chip reader, because that is one less charger maybe that could be put out there. And we know exponentially we need a ton of chargers. So I know that's kind of asking you all to kind of thread the line on like the safety of using the EMV chargers, and saying, well, it's not that much to add on the cost, but I'd also tell you that that's less chargers where it could be going to, more chargers in disadvantaged communities.

And I just look forward to the data and the research that's coming out. And I hope we solicit input directly from our AB 617 communities, those that are CalEnviroScreen communities, and again just underline borrowing ideas from what's currently working in public transit and how we can mimic it and make it better.

But I do think we need to evaluate this now and see what it looks like in a year's time, because it may be a better solution than what we've put forward now.

And I think in Europe there's a lot of like different ways that folks are using to pay and it's not

with a chip reader -- EMV chip readers, so we need to understand and analyze that as well.

Okay. Thank you, Chair.

CHAIR RANDOLPH: Dr. Sperling and then Board Member Kracov.

BOARD MEMBER SPERLING: I have nothing to say.

CHAIR RANDOLPH: Oh. Oh, sorry.

Board Member Kracov.

BOARD MEMBER KRACOV: Yeah. I was going to ask why the survey didn't ask whether the chargers were causing marital problems, but that's a --

(Laughter.)

BOARD MEMBER KRACOV: Okay. So really appreciate staff coming back on this. It was raised I think during public comments, you know, four, five months ago and you promised to come back and you did. So, you know, really appreciate that consistency and follow through.

You know, we still have sort of this difference of opinion even after the release of this survey. I know, Ms. Gress and her team, you know, are aware of that. So I wanted to try to drill down a little bit to see if we can kind of get at the heart of the issue. You know, I heard all of the commenters today, you know, they want more access. They want it to be reliable, Board Member De La Torre, and they don't want it to be too expensive.

I think everybody wants that. We need a proliferation of these, especially the Level 2 chargers, which are so important in the disadvantaged communities and really I think a key to solving our equity piece.

So, you know, it comes down to sort of this cost issue. The folks from the industry, the vendors as another Board member called them, are saying that including the card readers adds substantially to the cost, especially for the Level 2 chargers, which may be, let's say, are five, six to ten thousand dollars, but adding the cost of the card readers is, you know, three or four thousand dollars.

So what I'd like to drill down a little bit and maybe ask a couple questions of staff, whoever the appropriate person is, is, you know, what -- what is the difference in cost between a charger with a contactless versus the cost of a charger with contactless and the card reader? To me, that's the fundamental thing here. If the card reader indeed is a lot more expensive, let's come to terms with that and figure out how it affects the cost and reliability questions. If it's not much more expensive, well, then that's a different story. But there's got to be a reason why industry keeps coming to us and indicating that there's a problem with the cost of these card readers. So can we drill down on that a little bit?

STCD CHIEF GRESS: Sure. Happy to. Jennifer Gress, Chief of the Sustainable Transportation and Communities Division.

I'll just start by saying we believe the actual cost of the -- of implementing the reg with the payment system requirements will be much lower than we -- we estimated as part of the original rulemaking and certainly lower than what stakeholders are claiming today.

So I'll start by saying when we did our economic analysis -- and lot of what we're seeing from stakeholders are relying on information from that economic analysis, when we estimated our cost, we -- we estimated the combined cost of chip and tap together. And so removing the chip requirement is not going to significantly reduce costs, because we could -- we looked at that together.

Now, to kind of tease apart a little bit, I'm going to talk about equipment costs and then operations and maintenance costs. So for the equipment costs, we originally estimated about $371 per unit combined tap and -- and chip reader. So more recent data that we've been asking from vendors kind of trying to differentiate what's the cost of a payment system that is chip plus tap versus tap only?

And what we're seeing is about $70 difference, roughly, based on initial more recent data. So that's

equipment costs. Looking at maintenance costs --

BOARD MEMBER KRACOV: So it's $70 cheaper to have without the card reader?

STCD CHIEF GRESS: That's right.

Now, looking at maintenance costs, and this was one thing that we estimated in our economic analysis, it's about $270 per year to maintain the payment -- the payment equipment on a charger.

And when we did that calculation, we assumed -- that cost came from basically a trip out to the charger to take a look at the payment equipment only. It did not include, you know, the -- kind of the broader charging equipment. It was just to look at the payment -- the payment technology.

So again, that cost was one trip to get at both tap and chip. And we think that, you know, that cost is the same, whether you have a chip and tap versus just tap. Furthermore, we believe that in actuality that most companies most of the time will probably combine a service call to a charger to look at both the equipment as a whole and the payment equipment, right?

When we did our economic analysis, just assumed those would be separate tips, because we were only -- we were only requiring in our regulation payment methods. So if a charging company combined their maintenance of the

system as a whole and the -- and the payment technology, we would look at much lower costs altogether associated with the regulation.

And then the last thing I'll say is one of the -- to help reduce costs of the regulation, one thing we allowed for is companies to comply with the payment technology requirements using a kiosk. So it doesn't have to be that every charger has a chip read. It can be the case that there's one kiosk that serves a bank of chargers. And that's another way that the charging companies can reduce their costs.

BOARD MEMBER KRACOV: Thank you, Ms. Gress. So did our survey discuss any of these cost questions or the survey was focused on a different topic, correct?

STCD CHIEF GRESS: Yeah. We had three different surveys, one of drivers. We didn't really ask about cost of payment technologies. The second survey was of the credit card companies, and the third was that the charging companies -- let me look to staff. I do not believe we asked any questions about the -- their cost of payment technologies.

STCD CHIEF GRESS: Okay. Yeah. We did not ask for that in the survey.

BOARD MEMBER KRACOV: Thank you. Just a few more questions then, Chair. So our conclusion is that -- so

the maintenance costs over time are much larger than this initial $370 cost, but it's our conclusion that over time either the visits that deal with problems with the card reader would be combined with normal visits to the location, right, or that you're not going to have a lot of special trips just to deal with the card reader issues, which are going to really inflate the costs, is that our conclusion?

STCD CHIEF GRESS: Yeah, our -- what we're anticipating is that companies by and large will do maintenance of the payment equipment when they do maintenance of the charging station as a whole. And they will not be separate costs as we estimated it in the original rulemaking.

BOARD MEMBER KRACOV: Do you have a sense, or maybe you can respond, I think it's a fair question, why do -- why do you believe we're getting such pushback from industry, if that's the case? If it really doesn't matter whether you have the combined system or just the tap, why is industry or -- and certain segments of the vendors so concerned about this?

STCD CHIEF GRESS: Well, it's hard to say for sure. I think there have been different concerns expressed to us over time. Initially, part of the concern was, hey, we've already designed our systems to be tap

only. This is -- in -- with respect to Level 2 in particular. And so we would have -- we need -- we would have to like redesign them and that's going to take time. And at the time we were doing the rulemaking, we heard that concern, and therefore extended the initial compliance deadline, so that they would have more time to redesign their systems. So by the time the Level 2 requirement is in effect, it will be four years from the --

BOARD MEMBER KRACOV: So we gave extra time.

STCD CHIEF GRESS: So we have them extra time. You know, there's been a lot of speculation as to, you know, the financial motive of a card company wanting to stick with tap -- you know, a charging company wanting to stick with tap. It's - you know, I hate to share speculation, but, you know, when you have the tap technology, right, that's the same technology that you use when you -- when you're paying through a membership RFID card or a membership-based app, right? It's the same technology. And so charging companies can make it easier to use the app for the -- or their membership card. And that's a way they just get more information about the user. That's the speculation that we have heard for a long time. It's hard for us to conclude that that's -- that's right or wrong, but that is what we've been hearing

over time.

BOARD MEMBER KRACOV: Well, thank you very much for this. You know, to me, and I think some of the other Board members, you know, we do believe, and I think, you know, there are some other studies out there that show that the technology is going in a different direction. I go to Starbucks all the time. People, it appears to me, of all income levels and demographies are -- or demographics are using their tap.

It just seems that that's where the world is heading. I know that we are going to continue to study this in the future. I would like to have more data on the cost question. We need to proliferate these Level 2 chargers. And if putting an antiquated card reader in there is going to make it more complicated, more costly, and less effective to deploy these, we have to get to the bottom of it. So as we're continuing to do these studies, Ms. Gress and staff, as we're continuing to survey the charging companies in the next iteration of this, I would like us to drill down further on this cost question, so that we know we're not, you know, shooting ourselves in the foot a little bit here. Does that make sense?

STCD CHIEF GRESS: Absolutely. We're happy to do that.

BOARD MEMBER KRACOV: Okay. Thank you.

CHAIR RANDOLPH: Okay. I think the cost conversation is really helpful. I mean I don't know what the real sort of rollout timeline is going to be for tap technology to be ubiquitous, but I think what we have learned so far is that it's not today and it's probably even -- I mean, even some of the data from the credit card companies indicate that this is going to sort of -- there's going to be an uptake, but it's going to be within the next two years.

And I think it kind of gets back to a -- a basic sort of regulatory question of do we stop what we're doing now and tackle this question immediately, or do we father some more data. And then based on the information we learn from Valley CAN study, you know, from other studies, take a look at this in a year's time or whatever timing kind of makes sense based on the data we're seeing, and then take action at that time, because I do think that the fundamental purpose of the statue and then the regulation that was adopted in 2019 was to have as many payment methods as possible and to -- people, -- so people didn't feel locked in to using an app. And I think that purpose is still valid.

It is not -- it's not, you know, chip or contactless, right? I mean, we are -- they can do both, and -- and so I think where staff is going with collecting

more data and understanding I think it's a fair question to ask for maybe some more information about costs for the difference, because I'm sure if you had no credit card reader at all, that would probably be a significant cost savings, but I don't know that that's where we want to go in terms of accessibility for individuals.

So then kind of to Jen's point, it really becomes a -- what is the incremental difference in cost of having both the chip and the tap. And so recognizing that that Delta may not be particularly large and the -- and the access benefits might be significant, I think we need to be willing to spend a little more time recognizing the future. And I do think when we do finally amend this regulation, you know, I think we're going to want to think about ways we can build a little more flexibility into it, so that we don't have to always go back to the regulation as things change. I'm not sure if that's possible or not.

But I -- buy I just don't see this as an urgent issue that has to be tackled immediately. I think we can take the time to get some more data and to see how the rollout is occurring and what people's real lives experiences are.

And I'm not even going to go down the reliability point, because I think my Board members and members of the public made great points about ensuring the reliability of

the charging network is very, very important and I think we have a lot of work to do there.

BOARD MEMBER HURT: I have a question of staff. Yeah. To that point, it sounds like the Chair made the point that we want to give it some time and see what the data shows, and that we're not maybe in a rush, or any time within the next year. What timeline does staff see that, you know, just to kind of signal to stakeholders how long you think you can -- you need to gather? You know, what does it mean to be broadly recognizable? I think that was one of the languages used in one of the staff reports to me. Just curious.

STCD CHIEF GRESS: Yeah. In terms of when we anticipate coming back to you all, we're thinking next gives. That will give us enough time to work through the listening sessions, through -- work through the Valley CAN process and continuing doing more cost analysis. But in terms of when we think that the transition to tap will be complete, it's really hard for us to predict that. It's clear that the tap is accelerating, but is it three years away, is it five years away? We know we can't predict that.

BOARD MEMBER HURT: I understand. Thank you.

CHAIR RANDOLPH: Okay. All right. As noted, this is an informational item, so no action is necessary.

And so we will now move to open public comment for those who wish to provide a comment regarding an item of interest within the jurisdiction of the Board that is not on today's agenda. And the clerk will call on those who have submitted a request to speak card or if those of you who are joining remotely who have clicked the raise hand button or dialed star nine.

BOARD CLERK GARCIA: Thank you.

We currently have one in-person commenter who wishes to speak.

So John Blue. You

MR. BLEU: Can I move to the back of the queue?

BOARD CLERK GARCIA: What?

Do you mind if I move to the back of the queue?

BOARD CLERK GARCIA: You're the -- you're the only in-person commenter.

MR. BLUE: I understand there's some on-line commenters. I'd like to hear what they say first.

CHAIR RANDOLPH: How many do we have in person?

BOARD CLERK GARCIA: We have on person.

CHAIR RANDOLPH: Oh, okay.

MR. BLUE: I may not -- I may not even speak at all. That's my concern.

CHAIR RANDOLPH: All right.

BOARD CLERK ESTABROOK: We currently have 12

people with their hands raised to speak online in Zoom.

Our first speaker is going to be Gary Hughes. And then after Gary will be Dave Cook and Frank Donnelly.

Gary, you can unmute and begin.

GARY HUGHES: Thank you so much. Thank you, Chair and thank you members of the Board for this chance to speak briefly. My name is Gary Hughes and I work as the Americas Program Coordinator for the international organization Biofuelwatch.

And I just really wanted to very briefly try to give the Board here a bit of an update about what is going on with the conversion of refineries in the San Francisco Bay Area to manufacturing renewable diesel and eventually sustainable aviation fuel. The governance of the environmental review has been highly irregular. And just wanted to flag that on Tuesday, May 3rd, next week, there will actually be hearings of the appeals of the Planning Commission decision with Contra Costa County to certify the FEIRs of both the Marathon Neste joint venture at the Martinez's Refinery and the Phillips 66 biofuel refinery project in Rodeo.

Now, I know that Chair Randolph is aware of these refinery conversions. I heard the testimony during the joint legislative committee on transportation policies. And it, as someone who's been very involved with the

governance of this and the environmental review and recognized all the irregular -- irregularities with the CEQA review of this, I was a little bit discouraged to see references being made to these refinery conversions as being so central to California's plan for decarbonization, without any recommendation of community concerns.

There's, you know, a lot that needs to be said about how the Low Carbon Fuel Standard needs very serious review. And we think that the issues that are being raised during the environmental review of these refinery conversions in terms of the high emissions of the refining process itself as well as with all of the evidence that's building with the risks of deforestation from relying commodities like soy for making fuel, you know, all of our concerns have been basically ignored.

So I just wanted to flag for the Board here that, yes, next Tuesday May 3rd folks should pay attention and see what's going on. There's a few other dynamics with the way that high executives from the Air Resources Board actually came to the planning commission hearings on these refinery conversion projects and spoke in support of the companies was also a dynamic that, you know, really illuminates the irregular governance around these issues.

So thanks for allowing me to make this extra comment at what has been a long meeting. Thank you for

your service.

BOARD CLERK ESTABROOK: Thank you.

Next is Frank Donnelly. Frank, you may unmute and begin. We're going to pull up your slides. So just give it a moment and I will -- we won't be able to display the timer while you're giving your slides, so I will keep track and I'll let you know when you've got 30 seconds left and when your time is up.

(Thereupon a slide presentation.)

FRANK DONNELLY: Good afternoon, Madam Chairman, and fellow Board members. I'm Frank Donnelly currently the President of Tractive Power Corporation and former founder area of Railpower Corporation from my team 55 dominant -- battery dominant hybrid locomotives nicknamed Green Goats into service between 2004 and 2007.

Back in 2005, each locomotive demonstrated market readiness of battery powered switcher locomotives, even though the older technology, lead acid batteries, fell short of rail industry expectations.

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FRANK DONNELLY: My new company, Tractive Power, manufactures industrial switching locomotives from remanufactured locomotive components. The industrial switcher application involves the moving of short strings

of rail cars spotting one at a time while each is loaded or unloaded.

This is the lightest duty application and an excellent opportunity for a evolving and maturing battery systems specific to locomotives. As the chart on the right illustrates, these industrial switcher locomotives offer higher Tractive effort than most railcar movers, allowing the longer cuts of cars to be moved safely.

Our industrial switching locomotives come in variations from two axles to six axles, which each allow an additional 23,000 pounds of Tractive effort or pulling power.

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FRANK DONNELLY: Utilizing the CORE voucher this summer, we will demonstrate our first zero-emission industrial switching locomotive at a locomotive repair shop Diesel Motive in Cali -- in Stockton, California. This facility is located in an area that has a CalEnviroScreen rate of 87 percent and borders on an neighborhood at 97 percent. The locomotive that will be parked when this locomotive is in service is a small 1950 era AP9.

BOARD CLERK ESTABROOK: Thirty seconds remaining.

FRANK DONNELLY: I beg your pardon?

BOARD CLERK ESTABROOK: Thirty seconds remaining.

FRANK DONNELLY: Okay. Better than a hybrid Green Goat, these locomotives are zero emissions.

Okay. Next slide, please.

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FRANK DONNELLY: We believe the CORE voucher program with its three-year lease option is an innovative approach to promote low-emission locomotives as the Carl Moyer verification and scrappage requirements or hurdles that we could not overcome with our Tier 4 locomotives.

BOARD CLERK ESTABROOK: Thank you.

CHAIR RANDOLPH: Clerk. I'm going to go ahead and note that we will be closing the queue in two minutes. So if you haven't already raised your hand to get into the queue, please raise it within the next two minutes.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

And now I will call on Dave Cook. Dave, you can unmute and begin your portion.

DAVID COOK: Hello. Can you move to the next slide, please.

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DAVID COOK: The motive -- good afternoon, Madam Chair and fellow Board members. My name is David Cook and I work for rail propulsion systems. Electric locomotives

have been market ready since the diesel electric locomotive was introduced in the 1950s, but the rail industry now feels burdened by decades of incrementally less reliable and more expensive equipment in the pursuit of lower diesel emissions.

The simplicity of batter-powered locomotives used in the right applications could reverse this trend, but we need to find a way to accelerate the evolution of battery systems in these locomotives in a manner that is low risk to railyard operations.

The three-year lease option under the CORE program that delays the need to scrap and existing locomotive may be the tipping point to getting enough systems in service to promote rail industry acceptance.

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DAVID COOK: RPS is focusing on battery conversions specific to four and six axle locomotive conversions for yard switching and shortline applications, while industrial switching locomotives that (inaudible) --

(Multiple voices.)

DAVID COOK: -- with strings of rail cars one spot at a time, yard switcher locomotives move longer cuts of railcars back and forth across small railyards to sort railcars between different tracks. Yard switchers will

require more power and energy storage.

This picture is the railyard that our existing zero-emission switcher operates at illustrating a shift work of railyard switching operations. It also illustrates how locomotives in these applications could be wirelessly charged while in motion on one track allowing 24-hour operations without downtime for charging.

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DAVID COOK: The 999 pictured here charging has been operating one day every few weeks for the last year at a railyard located in an area with an EnviroScreen rating of 88 percent and a pollution burden of 93 percent.

Every day the 999 is operating, it is displacing a smokey 1950s GP9 locomotive. With a CORE voucher, RPS can both convert this railyard to regular daily zero-emission service and also allow our partner company Pacific West Systems to temporarily place the 999 at other California railyards in order to educate others on this technology and generate additional customers for zero-emission locomotives.

In the CORE program workshops that Tractive Power and my company participated in staff has expressed a reluctance to keep the manufacturer self-purchase option.

BOARD CLERK ESTABROOK: Thirty seconds.

DAVID COOK: RPS is requesting CARB leadership staff extend the manufacturer's self-purchase option and increase the voucher limit for the CORE Program. As the retail cost for higher performance zero-emission switcher locomotives may range up to $5 million, the current $500,000 cap will slow down the market penetration of higher performance battery switcher locomotives.

I'd be happy to any -- answer any questions and thank you for your time.

BOARD CLERK ESTABROOK: Thank you.

CHAIR RANDOLPH: Board Member Kracov.

BOARD MEMBER KRACOV: Just a quick follow-up. I hear from this stakeholder a lot in the South Coast. This is the CORE Program. Who on staff would be the person to speak to about the CORE Program?

DEPUTY EXECUTIVE OFFICER SEGALL: Yes. That's us. I was chuckling earlier, because I've never seen anyone so seamlessly give a presentation across two commenters.

BOARD MEMBER KRACOV: Right.

DEPUTY EXECUTIVE OFFICER SEGALL: But the larger point about the importance of zero-emission locomotives is a real one.

BOARD MEMBER KRACOV: Okay. So I could follow up with you afterwards?

DEPUTY EXECUTIVE OFFICER SEGALL: Yes. And I guess what I'll just say briefly, Board Member, is that CORE is modifying some of its guidelines that should provide broader access for certain kinds of zero emission switchers. I don't know about this particular project of course, but there is room there and we can follow up further.

BOARD MEMBER KRACOV: Thank you so much. I'll follow up with you after the meeting, Mr. Segall.

CHAIR RANDOLPH: Thank you.

Okay. Clerk, go ahead and continue calling commenters.

BOARD CLERK ESTABROOK: All right. Thank you.

Next will be Elliot Gonzalez. After Elliot will be Karim Tarraf.

Elliot, you may unmute and begin.

ELLIOT GONZALEZ: Hello. Good afternoon. My name is Elliot. I live in Long Beach, California. I'm a nation -- I work with the national organizing team of the Sierra Club and just in my personal life I'm a -- I'm a member of the Sierra Club. I'm an activist. Very concerned about the short time before the planet reaches a point of no return and what the International[SIC] Panel on Climate Change is saying. I just wanted to talk really briefly about the Scoping Plan and just a few issues that

I noticed with it.

One, that it doesn't call for the stopping of any new gas plants in all of the plans. And I just think that environmental activists have been very clear, the International[SIC] Panel on Climate Change has been very clear, that we must stop using fossil fuels, that includes gas and so-called renewable sources from cow exhaust is not stopping the methane -- the methane concerns.

So I just wanted to say that Scenario 1 looks like a promising scenario in that it does promise carbon neutrality by 2035. But, in general, there's still, I think, a more robust discourse that needs to be had with the public. I don't think that this represents a public vision for a just transition. And that's really what the work of the Air Resources Board is to pell out exactly how does California go about a just transition? How do we stop all of these gas plants and retire them in a very short amount of time, and looking to how that's going to affect the economy and plan the economy accordingly.

So I just would like to say that I think that this type of discussion needs to be had out with the public and that the public has a lot of ideas on how to reach attainment and reach our climate goals. Solutions for the renewable future are here and -- and I do think that -- that there needs to be a greater public

discussion.

So CARB, at this point, is failing to appropriately address the environmental injustices that are going on. The climate reality needs to be fully expressed in a document. It needs to have vision and that vision must come from the public. So I just want to ask as a member of the public that CARB be more thorough in engagement and really make some space for the public to give its input on -- in terms of what types of Scoping Plan -- what is the general scope the Air Resources Board needs to be looking into in order to reach its compliance.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speaker will be Karim Tarraf. After Karim will be Ari Eisenstadt, Catherine Ronan, and Ashley Hernandez.

Karim, I -- we will be pulling up your slides for you. And when you see them, you can unmute and begin your comment.

(Thereupon a slide presentation.)

BOARD CLERK ESTABROOK: I will give a reminder when you have 30 seconds remaining and when your time is up.

KARIM TARRAF: Thank you very much for the Invitation to speak in front of the board. My name is

Karim Tarraf. I'm one of the four co-founders of a company Hawa Dawa based in Europe. A bit of background to myself.

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KARIM TARRAF: I grew up in Cairo, Egypt, a city that shows all the typical traits of an emerging economy. Both my parents were -- or are doctors for respiratory diseases. My brother suffered from childhood asthma. So I'm very well aware of how air pollution not only needs air quality monitoring in (inaudible), but it's about limited life quality, high health care expenditures, and episodes of asthma attacks where we try to find reliever medication and wondering what type of trigger caused that and when this trigger occurred.

So this question actually is a mirror image of the question I heard earlier is how does, you know, what we do equate to improved health. And the question lies in what type of data do we have

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KARIM TARRAF: So, of course, we're all familiar that we collect data with these large instruments, very delicate, very complex instruments that can really measure particulate matter, for example, up to the fifth digit

after the decimal point, but because of their del -- expensiveness, we cannot rule -- roll them out area-wide. And of course lower cost sensors and mobile sensors promise to fill this gap, but they fail to abide to the standards that we use to determine how air quality is judged being above threshold or lower than threshold and really assess the severeness of air pollution.

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KARIM TARRAF: And I want to point the Board to a -- towards a development here in Europe where hybrid sensor networks are now happening where, for example, our company was able to prove that with a hybrid sensor network and with a sensor network that we can achieve the same level of accuracy as -- accepted as well in the U.S. For example refer -- against the reference method and the equivalence method, so you can really have -- not compare oranges with apples anymore, but really have standardized data and really bring the data that you trust under surveillance of air pollution, and really answer the question on how this air pollution affects our health.

If you go to the next slide.

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KARIM TARRAF: And this -- the one after, please.

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KARIM TARRAF: And this allows us to answer questions like what you see on the right-hand side, how many people with diabetes, how many people with asthma, how many people with respiratory diseases, or cardiovascular diseases are exposed to NO2 levels, for example, higher than 40 micrograms. You can really dig down into the data on a postal code level or even on a street by treat level and understand in real time how does -- how does the policies that he CARB introduces really affect environmental justice and health as a whole. And you can also use the same data to really combine it with traffic information the types of vehicles are driving through here and it really has --

BOARD CLERK ESTABROOK: 30 seconds remaining.

KARIM TARRAF: -- that's one of the biggest challenges that California faces.

So if you go to the -- actually the slide before last, you can skip all through and just go to the slide before last.

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KARIM TARRAF: What we're looking for is a way to demonstrate the -- or in the pilot deployment the system as it operates in California and to prove that it can really achieve regulatory grade accuracy and support in identifying the hot spots, the so far -- the social

identification, as well as really deploying it in key locations, such as schools and hospitals, and really take the question of how does what we do equate to improved health really have numbers and data behind it --

BOARD CLERK ESTABROOK: Thank you.

KARIM TARRAF: Yeah -- instead of guessing.

BOARD CLERK ESTABROOK: Thank you. That concludes your time. We do have your entire slide show. We see that you've posted it to the docket, so thank you for that.

Our next speaker will be Ari Eisenstadt and then Catherine Ronan, and Ashley Hernandez.

Ari, you may unmute and begin.

ARI EISENSTADT: Hi there. Thanks so much. My name is Ari Eisenstadt and I'm a staff member of the California Environmental Justice Alliance. And I'm speaking on the Scoping Plan electricity sector scenarios today on behalf of the Regenerate California campaign. Thank you so much for the opportunity to provide public comment.

I'm here today because of the unjust nature of the Scoping Plan proposals. As you all are aware, CARB staff recently recommended adopting Alternative 3, which like Alternative 2 and 4, allows 30 million metric tons of greenhouse gas emissions from the electric sector through

2050. All of the Scoping Plan scenarios, even Alternative 1, propose new gas builds. In particular, Alternative 3 would require a projected 10 gigawatts of new gas-fired power capacity. This is equivalent to roughly 38 new midsized gas fired power plants.

California, like the rest of the U.S., has a history of disproportionately siting these power plants in low income communities of color, contributing to some of the highest ozone pollution burdens in the country. In order to have a Scoping Plan that operationalizes racial equity, we are asking that the Board demand that there be no new gas capacity in any of the electricity sector scenarios, and that all of the scenarios should reach zero million metric tons of greenhouse gas emissions by 2045.

The consequences of CARB's actions are extremely significant and you have the opportunity to lead the country and the world with ambitious Scoping Plan goals. Entertaining the expansion of fossil gas would do the exact opposite. The Scoping Plan is an opportunity to send a signal to agencies like the CPUC and to the rest of the country that we will no longer sacrifice communities of color.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Catherine Ronan, you may unmute and begin.

CATHERINE RONAN: Good morn -- good afternoon. My name is Catherine Ronan and I'm a member of the Sierra Club in California. I'm speaking today because I'm very concerned about what I've seen of the CARB Scoping Plan, which will be coming before you soon.

Right now, shockingly, all four alternatives proposed by staff call for more gas plants. We need to be ending our reliance on gas. Not only is burning methane a particularly dangerous way of emitting greenhouse gases, but it's also toxic to our communities, where these gas plants are located.

The scenarios also rely way too much on carbon capture, which is unproven at large scale. We have better alternatives to gas and carbon capture, such as more renewable energy including solar, wind, offshore wind, and geothermal resources, storage, energy efficiency, and demand response.

Moreover, Alternatives 2, 3, and 4 are all very similar and none of them are ambitious enough. They don't meet the requirements of SB 100 or of Governor Newsom's edict that every alternative reach a zero carbon electric system by 2045.

I believe that CARB can and should do better. CARB needs to present multiple pathways to address air quality concerns in the electric sector. And this

requires offering more than one scenario that provides tangible improvements in air quality for front-line communities. CARB can do this by raising the level of ambition in Alternatives 2, 3, and 4.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Ashley Hernandez will be next. After Ashley will be Sofi Magallon, Angie Balderas, and Francis Yang.

Ashley, you can unmute and begin.

ASHLEY HERNANDEZ: Hello. Thank you. My name is Ashley Hernandez. I'm a resident of Wilmington, California and an organizer with Communities for a Better Environment. We are a leading environmental justice organization in the state of California building people power and advocating for environmental health and justice.

I'm here speaking on the CARB Scoping Plan.

CHAIR RANDOLPH: Excuse me, Ms. Hernandez. I'm sorry to interrupt. Could you -- would you mind speaking up a little bit. We can barely hear you.

ASHLEY HERNANDEZ: No worries. I also -- I want to begin by urging the CARB Board to reconsider prioritizing public comment, because allowing residents to be online for a few hours to fight for our health is an unnecessary obstacle. And public comments should be a priority as well as uplifting the voices of impacted

residents. I'm calling because the CARB needs -- CARB needs to create an aggressive plan to prevent environmental injustices going on in our State and prevent the worst impacts of climate catastrophe in our serious climate conditions.

CARB wants to keep burning gas, and that includes investing in building more gas plants. Burning gas is a direct attack on those living on the front lines of toxic energy that harms -- harms the lungs and health of my community and our impacted planet.

I live in a refinery town and air quality affects so many of the peers, family, and members I've enacted with throughout the years. All of these folks can't be here today, but feel strongly as I do that creating a plan that allows impacted neighbors thrive rather than face aggressive forms of cancer, asthma, and much more should be important and be the priority.

I'm asking the Board to stop any new plants in all plans and ensure that all plans should reach a zero MMT by 2045, and need new scenarios because only one helps us reach the goals that will protect our most impacted communities.

It is inexcusable that CARB wants to keep all our communities attached to gas and even build new gas project. Solutions for renewable energy are here and we

need those investments to be done and delivered. And we need to invest in these alternative forms before spending any more money on gas and other harmful forms of energy that are directly situated in our neighborhoods.

The bottom line is that front-line EJ communities have a right to clean air and healthy lungs. Please make sure that the health of our communities is your top priority by rejecting all gas and helping our state move towards a clean and just energy future.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

The next speaker is Sofi Magallon. Sofi, you may unmute and begin.

SOFI MAGALLON: Good afternoon. Thank you for the opportunity to speak. My name is Sofi Magallon. I am a resident of Oxnard, California and I'm with the organization CAUSE. I am speaking on the CARB Scoping Plan electricity sector scenarios. CARB needs to create more ambitious plans and create the path to zero emissions to stop the environmental injustices ongoing in our states and for the health of both our people and our planet.

My community of Oxnard, California in the Central Coast has a population of about 75 percent Latino and is surrounded by fossil fuel plants, a Superfund site, and a port that continually leaches heavy levels of diesel

exhaust.

In 2017, Oxnard residents advocated to stop the building of a new 262 megawatt natural gas peaker plant named Puente and won this victory. Out of the four scenarios proposed by CARB, CARB staff formally recommended Scenario 3, the second least aggressive path, which does not shut down any of the gas power plants that currently pollute our neighborhoods and keep all fossil fuels gas plants operating.

The first scenario, which is said to be the most ambitious, reaches our climate goals by reaching a hundred percent carbon neutrality by 2035. However, this first most ambitious scenario still allows a build-out of six gigawatts of natural gas, which is equivalent to 23 Puente power plants that my EJ community fought so hard to stop. And CARB -- and CARB recommended the second least ambitious scenario.

In the CARB Scoping Plan, I am asking the Commission to stop any new gas plants in all plans and ensure all plans should reach zero MMT by 2045.

Thank you so much for your time and consideration.

BOARD CLERK ESTABROOK: Thank you.

Angie Balderas, you may unmute and begin.

ANGIE BALDERAS: All right. Good afternoon. My

name is Angie Balderas. I reside here on occupied Serrano land in the IE. I'm an organizer with the Sierra Club My Generation Campaign, and also the co-chair to the AB 617 San Bernardino/Muscoy.

I'm here to speak on a huge piece of the puzzle in order to get us to zero-emissions. We need CARB to create the road to zero emissions for the health of all our folks and our planet. I live in the IE where the air quality is -- well, how do I put it in a nice term. It's shitty. And it affects only -- it affects my family, me, my loved ones, my community very harshly, even in -- like for some folks it's death.

I'm really not looking forward to breathing issues and the doctor visits this summer, but that's the struggle of living in impacted communities like the IE. We are demanding the Commission to stop any new gas plants in all plans. Let's ensure a plan that should reach zero emissions by 2045 or sooner. That would be nice. We need new scenarios, because only one brings us here. Let's do right by our communities, our climate, and Mother Earth. Bring forth a community-centered CARB Scoping Plan.

And I've been -- CARB is really failing to -- our communities and to be community-centric. I've been hearing the words equity and equality tossed around so casually, so empty -- some empty words that you're all

just throwing around. Just -- I mean, start within your own infrastructure, your own -- your own agency. Like a simple thing as public comments, you all don't make it very inclusive for everyone. Step back and remember that not everyone has the privilege of getting paid to be here and sit around since nine o'clock in the morning.

Community has to take the time off. Community has to make arrangements in order just to fight and voice their concerns for you all to listen, and sometimes it falls on deaf ears.

So if you're going to be using words like equity and equality, don't talk about it, be about it. Let's do better. Let's be better. Come on, CARB, do better by the communities that you so are appointed to fight for.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next speakers will be Francis Yang, David Haake, and Andrew Craig.

Francis, you can unmute and begin.

FRANCIS YANG: Good morning -- I mean, afternoon. My name is Francis Yang. I'm a resident of unceded Tongva land in Los Angeles and part of the Sierra Club My Generation Campaign. I'm commenting today on the CARB Scoping Plan and really here to urge you all are air regulators and CARB staff to be ambitious and create the

road to a clean energy future.

Every day for years now, you've seen climate catastrophes. Even here in California, we're all familiar with wildfire season, which has turned into a constant wildfire state. Our water has dried up. We're concerned there won't even be enough in LA to get through the summer, and all the while communities breathe the air of our outdated, extractive, and toxic fossil fuel systems to keep the lights on.

We know that the solutions are here and we have the tools to heal our climate and people. But when I look at the four scenarios proposed, I see even more pollution in front-line communities. I see an insufficient response to climate catastrophe. I see my future's needs unmet and environmental justice postponed again.

As leaders of our state, we need you to stop any fossil fuel buildout. It feels so backwards to be asking you to stop this, when the conversation should be about retiring them rapidly. We need that road to zero greenhouse gas emissions ASAP. Even 2045 is late, according to any authoritative climate report.

And in Scenario 3, the one that CARB staff recommends is not a path to the future. It looks more like a dead end. CARB Commissioners and staff we need you to be bold and ambitious. Deliver us a Scoping Plan that

prioritizes environmental justice and meets the climate needs.

Lastly, to follow up with Angie, we have been waiting for hours to provide general public comment. And as some of you all have been discussing what equity looks like, it can look like bringing public comments at the beginning of the meeting so that everyday people who are unpaid to be here can say what they need to say and get back to their busy lives. We had requested this earlier, but were rejected. And this is not an inclusive nor equitable time for communities to engage and we need to do better.

Thank you for your time.

BOARD CLERK ESTABROOK: Thank you.

David Haake, you may unmute and begin.

DR. DAVID HAAKE: Hello. Can you hear me?

BOARD CLERK ESTABROOK: Yes, we can.

DR. DAVID HAAKE: My name is David Haake. Thank you for the opportunity of speaking today. I'm a resident of Los Angeles and I'm speaking on the CARB 2022 Scoping Plan. I'm a professor at UCLA and a physician practicing in the Los Angeles area.

I'm speaking because Los Angeles continues to have the worst air quality in the entire country, particularly in our front-line communities. CARB needs to

be much more ambitious in stopping the environmental injustices ongoing in our city and to prevent the worst impacts of the climate catastrophe. It's extremely unfortunate and does not reflect well on CARB that despite our rapidly deteriorating climate CARB wants to keep burning gas and wants to build more gas plants.

Burning gas harms our lungs and the health of our communities. We need CARB to create the road to zero emissions for the health of both our people and our planet.

I'm calling in today, because I care about this issue, not only because I live here in Los Angeles, but because the poor air quality here is harming me, my family, and my community. I don't understand why all the scenarios in the Scoping Plan involve building new gas plants. The Scoping Plan is supposed to create a plan for reducing emissions, better health for the communities most impacted by environmental racism, and fewer costs for working families.

To do this, we need to close down those dangerous gas-fired power plants. Unfortunately, CARB staff is recommending a scenario that does none of these things. We need a scenario that moves us forwards not backwards. It's time that the California Air Resources Board steps up, does its job, and protects the air for me and the

millions of people living in the Los Angeles area.

Thank you very much.

BOARD CLERK ESTABROOK: Thank you.

Andrew Craig, you can unmute and begin.

ANDREW CRAIG: Good afternoon, Chair and Board members. And thank you for the opportunity to comment today. My name is Andrew Craig and I'm representing California Bioenergy. We are a company who partners directly with family-owned dairies throughout California, and we help develop anaerobic digesters on their farms.

And we want to just say we deeply appreciate the work of CARB and the leadership you've displayed over the years in taking the steps to seriously tackle climate change by developing the necessary incentives through SB 1383 and the Low Carbon Fuel Standard Program. These programs help to incentivize the capture of dairy biogas to be utilized for beneficial use as a renewable natural gas and for electric vehicle charging.

CARB, along with multiple international, national, and state authorities, including the IPCC, EPA recognize that methane reductions are the best, most cost effective, and will result in the most immediate cooling impacts than any other climate protection strategy.

Digesters are among the most, if not the most, cost effective means of achieving methane reductions on a

public dollars invested per greenhouse gas reductions achieved.

We currently have dozens of digesters operating and producing renewable natural gas, as well as a fuel cell project that is operated on dairies that's delivering ultra low CI electricity to power the electric vehicles that have been discussed today. This is technology that is ultra clean, creating electricity with virtually no emissions all while helping solve the climate crisis, create jobs, and improve the economic viability of the dairy.

So I just want to say that these programs that have been developed by CARB's -- CARB over many years to incenti -- incentivize digesters are working exactly as planned. We want to thank you for the workshop that was hosted on March 29th to allow the facts about digesters and their benefits be expressed. And we just -- you know, we stand ready with CARB to deliver on the much needed emission reductions and help continue the leadership of the state, who's leading the world and showing what it looks like to deliver climate solutions.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Our next -- our final three speakers from Zoom are Michael Boccadoro, a phone number ending in 371, and a

phone number ending in 645.

Michael, you can go ahead an unmute and begin.

MICHAEL BOCCADORO: Thank you. This is Michael Boccadoro on behalf of the Agricultural Energy Consumers Association. I just wanted to also call in and thank the Board and staff for the honest fact-based discussion that occurred last month on the important role that dairy digesters and other dairy methane reduction efforts are playing to reduce methane from livestock.

I cannot stress enough and, you know, support the comments of Mr. Craig a few moments ago that markets, including the LCFS, are critical if we're going to achieve the reductions the State is looking for. We can capture methane, but we have to be able to put it to productive use.

As Mr. Craig stated, our efforts are fully consistent. I think this is one of the key points from the workshop was what the United States government and administration are doing, what the European Union is doing, United Nations is doing, and also supported by leading environmental organizations as the optimal way to reduce methane.

Simply put, without digesters and markets for cost effective utilization of the renewable energy, our livestock methane reductions that the State is looking for

cannot and will not be achieved. We're leading with an ambitious 40 percent reduction. And we simply cannot get there without digesters. And we're well ahead of the rest of the world who are all working toward a 30 percent pledge. We cannot lose sight of that.

And I just want to conclude by saying digesters are not a silver bullet solution for all livestock operations, but they significantly reduce methane and they have shown documented substantial reductions in criteria air pollutants.

And really important, we cannot throw out the really, really good in search of the perfect. And we recognize that digesters do not solve some of the water quality concerns that are constantly being raised by the environmental justice community, but you can rest assured that your sister agency, the State Water Resources Control Board is actively working on a precedential order, as we speak. And the environmental justice community has been involved in that process every step of the way, along with the dairy sector. And they'll be putting out enhanced water quality requirements for dairies in California moving forward.

We already have the world's most stringent environmental regulation of these projects. That was shown time and time again during the workshop. And those

water quality requirements are going to get even more significant here in California going forward. So recognize that some of these issues not addressed by digesters are being addressed appropriately by the other agencies that have that jurisdiction.

Thank you and thank you for your leadership on this issue.

BOARD CLERK ESTABROOK: Thank you.

Phone number ending in 371, you will hear a prompt to unmute and then you may begin your comment. Please make sure to state your name for the record.

BILLY: Hello?

BOARD CLERK ESTABROOK: Hi. We can hear you.

BILLY: Hi. Is -- Awesome. Hi my name is Bill and I'm a resident of South LA. And I'm just calling in and, you know, very concerned about some of the things that are being discussed, particularly the fact that we're still pushing for more fossil fuels, when this is the time that we're in the middle of a climate crisis and we should be talking about zero emissions.

I also want to point out, you know, I live about two blocks away from the 110 Highway. Before that, I lived three blocks away from the 101. And before that, you know, my family in Carson lived about two blocks away from a highway as well. What I'm trying to say is that,

you know, the people who are going to be most disadvantaged from having more gas, and, you know, continuing to push fossil fuels are the people who are already disadvantaged and living in these communities. I think it's getting hard enough for working people to live in California, how expensive it is, how unaffordable things are. And a lot of people are moving and we just want to stay here and live here, but we need a clean safe environment. And if we're not talking about zero emissions, we're not talking about the future.

We don't want these problems to keep on coming up. And I think this is a really, you know, historic opportunity for the Board to make a statement and move forward and say that we do want a livable city, we do want a livable state, and that we do care about the people who live here, because increasingly like a failure of leadership is showing that it's the opposite.

So I just wanted to say that. Thank you for listening. And, yeah, I do hope that, you know, this is taken seriously. And I appreciate all the other callers voicing their concerns as well.

Thank you.

BOARD CLERK ESTABROOK: Thank you.

Phone number ending in 645, please unmute, state your name for the record, and you may begin.

You might need -- oh, yeah. It looks like you're unmuted.

SVEN THESEN: Hello. My name is Sven Thesen. Chemical engineer by training, business owner, taxpayer, and dad. I would like to read something by Martin Eberhard, co-founder of Tesla Motors from May 2007, 15 years ago.

"The Air Resources Board continues to show a bias towards hydrogen fuel cell vehicles and against the less expensive and more efficient battery electric vehicles. Tesla Motors believes this bias not justified by science or the evidence of actual vehicles and infrastructure.

"However, we are actually delighted by the way this bias find implementation in the ZEV mandate. For the results of this mandate is that all of our potential EV competitors, all of the big car companies, remain mired in non-productive and deeply expensive fuel cell programs keeping them out of the EV marketplace and indeed out of the serious ZEV marketplace entirely.

"Every year spent on a hydrogen fuel cell program by GM, Honda, Ford and the rest is another year that we at Tesla motors can build our technological and market lead in the

obviously winning technology, battery electric vehicles. We therefore sarcastically and enthusiastically encourage CARB to maintain the hydrogen bias and keep our competitors in the quagmire".

So let's just state some facts. This month -- excuse me the month of March this year, Tesla sold 111,000 electric vehicles. There are only 11,000 fuel cell vehicles on the road in the United States since, what, 2004? Elon Musk said, hydrogen fuel cell vehicles mind-boggling stupid. And we spend the money that we taxpayers are paying for fuel cell support on what's really solving the problem, please? Can we wise-up and accept that electric vehicles won the economic and environmental. It's just science people and economics. Just like that other caller just said, we're paying taxes for a technology that doesn't work. Can we please stop. It's just -- it's just inane and it's not good for our kids and the future of California.

Thank you.

BOARD CLERK ESTABROOK: Thank you. And then John, did you want to make a comment.

MR. BLUE: I'm good.

BOARD CLERK ESTABROOK: Okay. So Chair, that concludes the commenters.

CHAIR RANDOLPH: All right.

Thank you much very much.

That concludes our formal agenda items for today's meeting. However, we are not done yet. We will now transition to a ceremonial presentation recognizing our Executive Officer Richard Corey.

I have an important announcement to make. As you may have heard, Richard is retiring, which causes us a great deal of heart break. His retirement will be effective June 30th, but this is going to be his last Board meeting where he is front and center with staff, and so we wanted to make sure that we recognized him over his objections.

It's hard to --

BOARD MEMBER KRACOV: You can still come during general public comment.

(Laughter.)

CHAIR RANDOLPH: It's hard to imagine CARB without Richard Corey. He's been an integral part of CARB's operations for 37 years. He began at CARB in 1984, having graduated with a degree in toxicology from UC Davis. He worked in the early toxics program, including the then new Air Toxics Hot Spots Law in 1987. He rose steadily through the ranks and by 1997 was Branch Chief in the Research Division, where he led the Innovative Clean

Air Technologies Program while at the same time working on his MBA at UC Davis.

In 2004, when CARB adopted its first in the nation limits on tailpipe emissions of greenhouse gases, Richard played a key role in developing, communicating, and defending staff's findings on the need to address climate change and the economic impacts of the regulation. And this set the course for CARB's further initiatives on climate change.

So I it made perfect sense that when AB 32 was then signed, Richard, who was the Assistant Division Chief in the Research Division, was responsible for the Early Action Measure Report, which developed early action measures to reduce GHG emissions. And many of those early actions became programs large and small that continue to this day for ocean-going vessels plugging in to the electric grid when at berth to nation reading -- leading regulations to control HFCs, which are powerful carbon polluting chemicals used in refrigeration.

As the Stationary Source Division Chief, Richard oversaw the adoption and implementation of the groundbreaking Low Carbon Fuel Standard. After becoming a Deputy Executive Officer, Richard oversaw the first Cap-and-Trade auctions and received CARB's highest honor, the Global Award of Excellence.

Then in 2013, Richard became CARB's Executive Officer. In the nine years since then, CARB has grown under Richard's rock steady leadership as it developed and implemented a string of nation-leading programs and initiatives. This included tackling methane and other short-lived climate pollutants, the continued implementation of the Truck and Bus Regulation, development of the Clean Freight Plan, and the 2017 Scoping Plan.

And, of course, in 2015, there was the Volkswagen scandal, which propelled CARB onto the world stage resulting in settlements that set in place the nation's first statewide electric vehicle charging system.

Richard took a personal interest in the passage of the Tropical Forest Standard, oversaw the creation of the Office of Community Air Protection and the AB 617 Program, created a new position for an Executive -- Executive Officer for Environmental Justice, and brought Chanell Fletcher on board to inaugurate that role and establish the new Office of Environmental Justice and Office of Racial Equity.

With the pandemic hit, Richard provided a steady hand overseeing a successful overnight transition to telework and oversaw a fundamental reorganization of the divisions, which set in place a structure that set the

stage for CARB's current work to eradicate fossil fuel combustion and develop the most important Climate Action Plan yet, the 2022 Scoping Plan, which will set the roadmap to carbon neutrality over the next quarter century.

And lest we forget, Richard was there last November when we dedicated our new Southern California headquarters in Riverside with our newly established Deputy EO Annette Hebert at its helm.

Richard's is, by any measure, a remarkable career that is touched the lives of thousands of CARB employees, Californians, and people across the country and the world. Rising through the ranks, Richard has provided us all with an exemplary commitment to CARB's mission in deed and word, and has continually demonstrated a tenacity of purpose and meticulous follow-through.

To show our heartfelt appreciation, the Board has prepared a resolution, which is in actually extremely small print, because there's so much to say about your work and your dedication to the State of California, so I am not going to read all of the very small print, but I will say that it ends with this sentiment, be it further resolved that while we will miss the pleasure of working with Richard and his constant encouragement and guidance, we wish him a fond farewell and extend our heartfelt

gratitude for his unparalleled leadership.

So before we turn to Board members for their comments, we, not surprisingly, have some of Richard's previous colleagues and dear friends here to say a few words.

So I will turn it over to Katie.

BOARD CLERK ESTABROOK: All right. We will begin with Mary Nichols.

MARY NICHOLS: Thank you, Katie. And thank you, Richard for putting up with this with a good spirit and I how embarrassing and painful this is to you --

(Laughter.)

MARY NICHOLS: -- to hear all these wonderful things being said about you, besides the fact that you richly deserve them and more. You're not exactly the type to stand up and take a bow for yourself. I can see you're already flushing a little bit.

(Laughter.)

MARY NICHOLS: So we'll just have to put up with this embarrassing situation for a little while longer. But I was delighted to be invited to join the list of people who were invited to say a few words before the Board members themselves speak up and just to say how much I value the time that you and I worked together. I've said to you I think before, and I would say to anybody,

that the relationship that we had when we worked together was phenomenal. And it was really something that I think enriched the Board history and our ability to get work done was the fact that you did such a terrific job not only of anticipating and figuring out what the Board was going to need in order to act as a Board, but also of communicating to the staff, and being that pivotal point that made sure that everybody was able to express their concerns, and to have input in all the procedural sometimes thickets that we had to go through to get things done. But that we were able to accomplish so much is really I think a testament to your skills and the fact that this job just suited you to a T. You shaped it in a way that I think will be a tough act for anybody to follow.

And I'm sure whoever it is will do so in their own unique way and make their own stamp as people always do. But I think you really have shown how critical the role of the Executive Officer is, both as an internal manager of the whole process, and also as the face of the Board to the rest of the world.

So I just want to say on this particular occasion how much I admire and appreciate you and your work at CARB. And I can't say enough about the joys of retirement, because I haven't actually ever figured out

what I was supposed to be doing in retirement. And I suspect you're going to have some of the same problem. But as -- as time goes on, I think you will find that this chapter in your life was of amazing significance for the State of California and for the world. And I hope you will look back on it as fondly as I do.

So thanks and best of luck in your retirement.

BOARD CLERK ESTABROOK: Thank you, Mary.

(Applause.)

BOARD CLERK ESTABROOK: Chair, that's -- the other speaker is not on at this time, so if you want to take the Board and then I'll back and see if they've joined.

CHAIR RANDOLPH: Okay. Supervisor Serna.

BOARD MEMBER SERNA: Great. Thank you, Chair. And I don't know if she's still on, but thanks to our former Chair, Mary Nichols, for her words.

Obviously, I think we're all going to want to share, you know, expression of thanks and good will on the occasion of your retirement, Richard, but I just wanted to share a particular experience that I had. It was actually a charge that our former Chair Mary Nichols gave me a few years back, and it was to help in your review, and to provide you some feedback about your job performance.

(Laughter.)

BOARD MEMBER SERNA: And my task was to talk to my colleagues up here, talk to your executive team and others in the agency and get their impressions of your executive leadership. And almost to a person almost everyone that I spoke to had the same thing to say, which was you have an unparalleled work ethic, so much so that if there was any criticism it was that you worked too hard and you're going to ultimately burn yourself out, which I'm glad you didn't. I think we're all glad that you didn't.

But I think the fact that everyone around us around here saw that your commitment to the mission of the California Air Resources Board was I think internalized to a point where not only is it your profession to lead us, but I think you made it a personal -- a very personal objective for yourself too. And it shows in the work product, and it shows in your leadership, and your ability, and your skill set. And I agree with the Chair, Mary Nichols about you -- you know, you being a very difficult act to follow. I'm not sure how the next person is going to be able to do that.

But I certainly have learned a lot from you. I want to thank you for your leadership. I've had a chance to work with you almost a decade now and just want to wish you well.

Thanks

CHAIR RANDOLPH: Board Member Takvorian.

BOARD MEMBER TAKVORIAN: Thank you. Hey, Richard.

(Laughter.)

BOARD MEMBER TAKVORIAN: This is odd, because I think -- so much -- so many nice things have been said and I would agree with all of them. I just -- I think one of the things I think about when I think of you is how you have such an amazing depth of knowledge about seemingly everything that CARB is doing. I mean, I can't remember having asked you a question that you didn't have a very complete answer to. So I've always been amazed and a little bit intimidated by that. So I wanted to thank you for -- for your vast wealth of knowledge and for being so willing to share it early in the morning, late at night, on weekends. And I really appreciate that.

And amongst many other things to say, I think your contribution to advancing environmental justice with the agency is really something that we all want to thank you for. I'm very grateful for it. I -- Dean and I cam on as the first environmental justice representatives and you welcomed us. And we started work on the position that Chanell is in and that Veronica was in. And I really appreciated your attention to that and to understanding

that that was just the first in many steps that would be taken to really advance environmental justice with the agency.

And another indication of that from you is within a few months you were in San Diego in my car taking a tour of the communities. And I really appreciated the time that you took to really get to understand the challenges that our communities are facing. And I know you've done that in many other places around the state, so I think we're all very grateful for that, as well as all the other things that have been acknowledged. So thank you and I think we'll still have your phone number, right, so --

(Laughter.)

BOARD MEMBER TAKVORIAN: Okay. Thank you.

CHAIR RANDOLPH: Okay. Dr. Sperling.

BOARD MEMBER SPERLING: I'm going to just be very brief, because, you know, we all know how fabulous you've been, Richard. You've been an inspiration. You've been a bun mentor on real-world politics and policy. I appreciate that. You've been a leader. Helped out in the very beginning with the LCFS. Helped out on -- you know, early on with ZEVs, with the ICT, that's the bus rule, and so much more.

So whoever gets you next, Richard, is going to be very lucky. And I just want to wish you my good friend

the best including more fun, a shorter work -- workweek and more hiking, and good beer.

(Laughter.)

CHAIR RANDOLPH: Board Member De La Torre.

BOARD MEMBER DE LA TORRE: Where to start. Well, just the obvious. Thank you, Richard, for your service to the people of California, to this agency. The level of work that you've put in on behalf of the people of California is tremendous as has been cited. We could not have accomplished what we've accomplished in these last nine years, or whatever it's been, for you as the Executive Director. And I didn't really know you before you became Executive Director.

So I must say now -- Liane and I had a conversation. And to me, now it's -- you're the model, right? Your characteristics are just right for this position. So whoever it is that is going to follow has to have those characteristics, namely the work ethic, namely the availability to the Board, because, you know, you're herding cats all the time.

(Laughter.)

BOARD MEMBER DE LA TORRE: I mean, I acknowledge we're -- I'm one of them. So that is really hard to do, where you give each of us our equivalent share of the action, as a colleague on another board said. I want my

share of the action. Well, you're giving us our share of the action. And that is incredibly important, and it's fair, it's balanced among all of us.

Your work with the Legislature tremendous - that was not always the case - where we sent somebody over there to represent us and we knew that things would be okay, that there wouldn't be blow-back at something that was said or some -- something. That's never happened with you. So I have nothing but confidence every time you go over there to represent us, because again in all that time, I have never heard a complaint. I did before.

So that's really, really important for this entity for this agency to know that we're not going to mistakenly get into fights with the Legislature, because that can happen. There's -- you know, there's egos over there.

So -- and I know, because I was there.

(Laughter.)

BOARD MEMBER DE LA TORRE: It's not -- that's not a slight. So -- so that's incredibly important.

The -- your knowledge of all the things that we do, as Diane mentioned, is -- is amazing. I've had the same experience where, you know, some -- I'll talk to somebody or -- and I'll have some kooky, you know, idea thrown at me and I have no idea. And I'll ask Richard and

he'll fire off like, you know, three paragraphs on it. And so, you know, that gives us confidence to be able to be responsive to people, but also that it's the right thing.

And then finally, in terms of strategy, in terms of direction, you get it. You -- you see the path to get a solution. And this -- this organization has so much on its plate. And you're juggling all of these pieces constantly with an -- with an end in sight to accomplish whatever the policy is for this -- this issue, that issues, et cetera. And they are all ways moving. And that's a -- that's a testament to staff. Obviously, you're the ones doing the day to day, but it's also Richard shepherding these things in such a way that -- that we get them done. And then finally -- I said finally before, but I'll say one more thing.

(Laughter.)

BOARD MEMBER DE LA TORRE: We know we're going to get challenged and sued on a lot of things we do, so we have to do it right. And that starts with the science and you certainly know the science behind what we're doing here from your background. And I like to tell people our science is going to kick your science's ass.

(Laughter.)

BOARD MEMBER DE LA TORRE: And it does and that's

why we win those court cases, because the science is true, and then the policy comes directly from the science. And that's why we win in court.

And so you have combined all of those components and have led us to where we are now, which is the leading air quality and climate agency on the planet. And thank you. Thank you for all of it. It's going to be really hard around here without you.

EXECUTIVE OFFICER COREY: Thanks.

CHAIR RANDOLPH: Okay. Well, I'll just be really brief, because I have -- although I've known Richard for several years, he was always the guy who would show up at the -- at these interagency meetings and would like have all the right answers and be very informative. So that was my experience before I came to CARB.

And it's been my absolute joy to be taught the ways of CARB by Richard. And, you know, kind of -- kind of what Diane said, the -- any issue comes up, and like, Richard, what's the deal with this? And there's a, you know, 20 years of history, really interesting statutory background, and stakeholder background, and, you know, scientific background, and it's all there inside his head. So I like -- you know, it would be nice if you could just leave all of that somewhere in a box for us, because it's going to be really hard without it.

And the other thing it's going to be hard without his sense of humor. He's just a fun person to work with, a fun person to talk to in our check-ins. And I'm really having a hard time imagining, like many of you all, what CARB is going to be like without him. And I'm like one of the -- like hanging onto his ankles like don't go, don't go.

So we'll all need to get used to it, but I just want to appreciate your service to the State of California and the world in terms of really thinking broadly and expansively about how to tackle climate change. And I'm really excited to see the things that you end up doing next and the ways that you will contribute -- continue to continue to the world.

Anybody else?

BOARD MEMBER KRACOV: Keep that phrase about the science out of the legal briefs, okay, Ellen?

(Laughter.)

BOARD MEMBER KRACOV: So thank you, Richard, for your service to California and to this agency. You know, I probably know you the least of everyone who's spoken here. I just joined the Board about 14 months ago.

The thing I will always remember about you is that every conversation we had I learned something from you. And I always -- also remember that whenever I would

reach out to you and say, Hey, Richard I'd like to speak with you, you would always text back, okay. Do you have some time Sunday morning?

(Laughter.)

BOARD MEMBER KRACOV: Yeah, he probably has us back to back.

And I always learned something during those discussions. I haven't spent a lot of time with you personally. I know you were gracious enough in the middle, you know, of the COVID stuff to spend an hour or two with me over there at Azul over a beer. And I learned a lot then too about, you know, your history, about your view of the accomplishments of the agency, and, you know, your view about culture of the agency.

And, you know, this agency has a culture of excellence. You know I've seen that in all of the staff in the way that things come to the Board. And, you know, my understanding and experience is it's not always that way with other agencies in State government. There's something about the way things are done at CARB, and, you know, that culture of excellence comes from the top.

And I've also observed your style of leadership, not only with the Board members and herding the cats, but with the staff as well. And there are really lessons of leadership there that I hope to carry on in my own life

and interacting with others.

You know, and the last thing I'll say is, you know, I haven't been at the agency that long, but I see the body of work that all of you have done under Richard's leadership and that Richard leaves. You're leaving the agency in a strong good place, and with all these accomplishments, certainly leaving the agency, you know, better than when you started. And I think that's what we all hope to accomplish in our service here in our service to the State.

So you're going to be leaving, but at least this Board member is going to try to emulate some of these lessons that I've learned from you in the short period of time that we've been together. So no matter what, your work will certainly carry on, and I look forward to continuing to chat from you -- with you and learn from you in the future.

CHAIR RANDOLPH: Okay. Oh, Board Member Hurt.

BOARD MEMBER HURT: Yeah, just really quickly.

Thank you.

So I'm new to the Board, as Board Member Kracov is as well, and I am just so sorry to have not had the time, like so many others, to get to know you really well. But one thing about you is every time I reached out, you were very fast on responding to back to me. And like many

others have said, the knowledge that you have and you imparted was so helpful, so easy to understand in a language that I received and understood. I'm very thankful for that.

And I think someone said earlier about packaging. It's like we need to get a tape recorder - is that an old word - get it in front of him and do the Richard Corey monologues or something to understand all that you know and understand here in this building and the work that we've done. But you've been very committed and your legacy will live on in the programs that have helped a lot of people set the standard in the world. And I'm very thankful to -- to know what I do know of you. And hopefully I can call on you in the future to give me that plain language explanation about some of these very difficult topics and conversations.

And I just wish you much successes and happiness in the next project in your life. Thank you for your time and your service.

CHAIR RANDOLPH: Okay. Then I think we are now --

BOARD CLERK ESTABROOK: No, i've got --

CHAIR RANDOLPH: Okay.

BOARD CLERK ESTABROOK: I'm sorry.

CHAIR RANDOLPH: I was like, you know, what's

next.

BOARD CLERK ESTABROOK: I was looking in the virtual environment, but I didn't realize your next speaker was here in person.

CHAIR RANDOLPH: Okay.

BOARD CLERK ESTABROOK: So if you want to come up.

CHUCK SHULOCK: All right. Thanks. Good afternoon, Madam Chair and members. Hi, Richard.

I'm Chuck Shulock, long time CARB employee. I'm here as the Ghost of Board Meetings Past, I guess.

(Laughter.)

CHUCK SHULOCK: Before I start for myself, I actually also have something from Tom Cackette who wanted to be here, but, you know -- I think he's actually meeting with your heavy-duty staff at the moment, so...

(Laughter.)

CHUCK SHULOCK: A glimpse into your future, Richard. This is from Tom.

"I've know Richard for a long time. Didn't often work closely with him while I was at ARB, but his reputation was a very smart and very hard worker. I retired before he became EO, so my comments here come from his -- from the viewpoint as an outsider.

"As a consultant, my clients and I have worked with Richard on numerous mobile source issues. He always welcomed our input, clearly had mastered the mobile source policy and technical issues, listened to us, and always provided helpful responses and advice. Often, that is all stakeholders need and expect, a knowledgeable and professional engagement with ARB management, and Richard provided that.

"It is really impressive that he found the time to personally engage with so many stakeholders, given the plethora of his other obligations ranging from the Governor, Legislature, Board members, the budget, and especially the 1,500 ARB staff members who remain the best in government.

"In summary, my outsider observation is Richard did A plus job and ARB luckily -- lucky to have him as EO. It will be hard to fill his boots and I wish you luck on that. The air is not yet clean for all Californians, especially those living in disadvantaged front-line communities. And climate change remains an existential threat. Richard, you have so much to offer, so please keep engaged and continue to

help solve these challenges. And finally, also take time to enjoy retirement. My experience is it is great".

And I'll segue to Chuck now and it's -- it is great.

(Laughter.)

CHUCK SHULOCK: I'll just second that.

I had the pleasure of working with Richard on many issues over the years. When I think back I'll just zero in on one memory. It may be a bad one for Richard, but I'll say it anyway.

When I think back, what sticks out for me is the run up to the first AB 32 Scoping Plan. Richard was in the Research Division at the time, Assistant Division Chief, I believe, and as such played a key role in describing both the impacts of climate change and the economic impacts of the control strategies. Both of those dimensions were essential to build the record and withstand attack.

The economic analysis in particular was challenging. That was the first time CARB was adopting economy-wide measures. There were not good modeling tools available to project the impact of the Cap-and-Trade portion of the program. Meanwhile, we were under tremendous scrutiny from all sides. It was a very, very

intense undertaking. Richard managed that analysis through several iterations with tight deadlines, with good communication, and good humor, and got the job done.

On a personal level, he certainly made my job easier at the time and on a societal level helped to ensure that the program moved forward to successful implementation.

Richard, many thanks for your contributions. If I'm batting cleanup up here, and it sounds like perhaps I am, just on behalf of all Californians, you know, good work. Good job.

(Applause.)

CHAIR RANDOLPH: Okay. So the meeting is officially adjourned and we're going to do some -- Board members I want -- we're going to do some photographs with Richard to present the resolution. And then we'll have some more celebration after that.

Great. So thank you.

(Thereupon the Air Resources Board meeting adjourned at 3:27 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and was thereafter transcribed, under my direction, by computer-assisted transcription;

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 16th day of May, 2022.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
License No. 10063