MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

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SACRAMENTO, CALIFORNIA

THURSDAY, DECEMBER 8, 2016

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JAMES F. PETERS, CSR
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Ms. Michelle Shultz Wood, Air Pollution Specialist, Railroad and Marine Enforcement Section, Enforcement Division(ED)

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

STAFF:

Mr. Mark Stover, Branch Chief, Field Operations Branch, ED

Mr. Floyd Vergara, Division Chief, ISD

ALSO PRESENT:

Ms. Joy Alafia, Western Propane Gas Association

Mr. Marc Aprea, Charge Point

Mr. Will Barrett, American Lung Association

Mr. Sudarshan Bhatija, Stanford University

Mr. Jeffrey Brown, Steye-Taylor Center, Stanford University

Mr. Nicholas Chavez, School Transportation Coalition, California Association of School Transportation Officials

Mr. Walker Dimmig, NET Power

Ms. Tiffany Eng, California Environmental Justice Alliance

Mr. Matt Essex, A-Z Bus Sales

Mr. Michael Gravely, California Energy Commission

Mr. Michael Jarred, Assembly Committee on Natural Resources

Ms. Shrayas Jatkar, Coalition for Clean Air

Mr. Ryan Kenny, Clean Energy

Mr. Bill Magavern, Coalition for Clean Air

Ms. Deepika Nagabhushan, Clean Air Task Force

Ms. Urvi Nagrani, Motiv Power Systems

Mr. Brent Newell, Center on Race, Poverty & The Environment

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

ALSO PRESENT:

Mr. George Peridas, Natural Resources Defense Council

Mr. Ryan Schuchard, CALSTART

Mr. Tom Sheehy, Greenberg Traurig

Mr. Andre Templeman, Carbon Market

Ms. Diana Vazquez, Sierra Club

Mr. Alan Walker, Petroleum Engineer, Department of Conservation Division of Oil, Gas, and Geothermal Resources

I N D E X

I N D E X C O N T I N U E D

P R O C E E D I N G S

CHAIR NICHOLS: Good morning, everybody. We're about to get started. Some of us, including myself, just arrived, and we're just getting ourselves settled, so I apologize for being a few minutes late, but we have a quorum. I will wait to have it officially declared, but I know we do. And I want to welcome everybody to the December 8th, 2016 public meeting of the Air Resources Board, and ask you to come to order. This is the last meeting of the 2016. And perhaps for different reasons, I think all of us can say a good thing too. It was a good year, but we're happy to have it over.

All right. With that, let us all get together and say the Pledge of Allegiance to the flag.

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

CHAIR NICHOLS: All right. The clerk will please call the roll.

BOARD CLERK HARLAN: Dr. Balmes?

BOARD MEMBER BALMES: Here.

BOARD CLERK HARLAN: Mr. De La Torre?

Mr. Eisenhut?

BOARD MEMBER EISENHUT: Here.

BOARD CLERK HARLAN: Senator Florez?

BOARD MEMBER FLOREZ: Here.

BOARD CLERK HARLAN: Supervisor Gioia?
BOARD MEMBER GIOIA: Here.
BOARD CLERK HARLAN: Ms. Mitchell?
BOARD MEMBER MITCHELL: Here.
BOARD CLERK HARLAN: Mrs. Riordan?
BOARD MEMBER RIORDAN: Here.
BOARD CLERK HARLAN: Dr. Sherriffs?
BOARD MEMBER SHERRIFFS: Here.
BOARD CLERK HARLAN: Professor Sperling?
BOARD MEMBER SPERLING: Here.
BOARD CLERK HARLAN: Vice Chair Berg?
VICE CHAIR BERG: Here.
BOARD CLERK HARLAN: Chair Nichols?
CHAIR NICHOLS: Here.
BOARD CLERK HARLAN: Madam Chair, we have a quorum.
CHAIR NICHOLS: Thank you. I have a couple of announcements to make. First, I want to make sure that people know that we have interpretation services in Spanish available for the third item today. That is the revised Supplemental Environmental Projects policy. And I'm going to ask the Spanish language interpreter to repeat this in Spanish, please.
Good morning.
(Thereupon the interpreter translated.)

CHAIR NICHOLS: Thank you.

Just to repeat the last sentence, the head sets that are used for people who want to hear in Spanish are available outside at the sign-up table, and can be picked up at any time.

Anyone who wishes to testify should fill out a request to speak card. And those are also available at the table outside the Board room here. And it should be turned in to the clerk or a Board assistant prior to the commencement of the item, so we can put the list together.

Speakers should be aware that we will be imposing a 3-minute time limit on speakers. And we appreciate if people will state their first and last name when they come up to the podium. And also, if they will put their testimony into their own words, rather than reading from a prepared statement, because it's easier for the Board to fool. And if you have a written statement, we will read it as well.

For safety reasons, I am required to point out that we have exits at the rear of the room, and on the sides of the dais here. In the event of an alarm, we need to evacuate the room promptly and walk down the stairs, and evacuate the building promptly. I think that's it for the housekeeping announcements. So we can move right into the agenda.

And we're going to start this morning with an informational item to make sure that the Board, and those who follow our meetings are updated on the progress that has been made so far in implementing the zero emission vehicle commitment that is expressed in the recently approved consent decree that covers the 2 liter engines. This is an agreement between Volkswagen and the federal government and ARB.

Appendix C contains a commitment by Volkswagen to invest $2 billion in zero emission vehicle projects throughout the United States, 800 million of which will be invested in California. This is a separate sum paid by -- I'm sorry, there is also a separate sum paid by Volkswagen into a mitigation trust. And California's share of that amount, which is the sum that's intended to be used to develop projects to mitigate the excess NOx that were caused by Volkswagen's use of a defeat device is about $381 million. That fund, the 381 million, is not part of today's discussion.

The consent decree establishes 4 principal areas of investment to promote and advance the increased use of -- increased use and availability of zero emission vehicles in the State. These include infrastructure, brand neutral public awareness, increased access to zero emission vehicles, particularly in low income and

disadvantaged communities, and a green city project. These are all major areas of investment to complement our State's zero emission vehicle program.

So I'm looking forward to the staff's presentation in more detail about how this is going to be implemented, and how we are advising Volkswagen about their investments.

So turn to Mr. Corey to introduce this item.

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair.

The consent decree approved on October 25th of this -- rather the 25th of this year represents the mitigation of environmental harm caused by Volkswagen's deception relating to the 2 liter diesel vehicles. And the consent decree is comprised of a main document and several appendices, as noted.

Appendices A and B specify the buyback and lease termination terms, as well as the requirements for any vehicle emissions modification. Appendix D sets up a mitigation trust to address all past and future excess emissions of NOx from the 2 liter subject vehicles.

Whereas, Appendix C, about which the Board is being briefed today is a binding commitment by Volkswagen to invest in ZEV projects in the United States, including an enhanced and specific commitment in California.

The consent decree does not resolve claims

relating to 3 liter vehicles, claims for civil penalties for 2 liter or 3 liter vehicles, or any potential criminal liability. And as noted, Appendix C requires Volkswagen to invest $800 million in ZEV projects over a 10-year period in California. You'll hear about the types of projects that are eligible in just a moment.

Collectively, the projects will support the next generation of zero emission vehicles that will be sold in California helping to grow the State's burgeoning ZEV Program, and will help lay the zero emissions foundation for achieving the State's air quality and climate goals.

No with that, I'd like to ask Analisa of the ECARS Division to begin the staff presentation.

Analisa.

(Thereupon an overhead presentation was presented as follows.)

ECARS ASSISTANT DIVISION CHIEF BEVAN: Thank you.

Good morning, Chair Nichols and members of the Board. Today, I will be providing an overview of certain elements of the Volkswagen settlement agreement, in particular Appendix C, the ZEV investment commitment.

My presentation will then provide a summary of California's proposed guidance and suggestions to Volkswagen regarding their investments. And finally, I'll go over the timeline and next steps.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: On October 25th, 2016, the United States District Court for the Northern District of California approved a proposed partial consent decree between ARB, EPA, Volkswagen, and the United States Department of Justice. The consent degree partially resolves Clean Air Act and California State claims against VW for equipping its 2 liter diesel vehicles with defeat devices. This consent decree fully mitigates the excess emissions from 2 liter diesel cars on the road and the environmental harm from the violations.

There are 4 elements to the consent decree. Each element is described in a separate appendix. The consent decree does not resolve any claims for civil penalties. That is forthcoming, nor does -- nor any claims concerning 3 liter diesel engines, nor does it address any potential criminal liability. Thus, the partial consent decree is not a penalty.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Appendix A is the buyback, lease, termination, and vehicle modification recall Program and Appendix B is the vehicle recall and emissions modification program. Together, they describe the procedures that VW will use to offer its affected consumers the option of either, one, a buyback or

lease termination, or 2, the option of an emissions modification in accordance-with-the-technical specifications prescribed in appendix B, if approved by government agencies.

The consent decree also allows consumers to choose to do nothing. The bulk of today's presentation will be about Appendix C. It specifies the terms and framework for Volkswagen's zero emission vehicle investment commitment. As described in the previous slide, the consent decree does not resolve penalties that may be associated with this case. As such, the ZEV investment commitment is not a penalty.

It is an agreement by the parties that VW will invest in activities aimed at advancing and promoting the use of ZEVs. As a VW investment, they will be directly expending the funds and may own, operate, and profit from their projects.

Appendix D, the environmental mitigation trust, is intended to fully mitigation all past and future excess NOx emissions from the 2 liter vehicles. Under the terms of the consent decree, VW must pay about $381 million into a mitigation trust over a 3-year period for projects to replaces older and dirtier heavy-duty diesel vehicles, and equip in California -- and equipment in California with cleaner vehicles and equipment, including advanced zero or

near zero emission technologies.

I want to make clear here the difference between appendix C and appendix D. To put it plainly, appendix C is an investment by VW administered by VW and with oversight from ARB. And appendix D is funded by VW, but held by a trustee and administered by a lead agency for each State.

Before I begin talking in more detail about the ZEV investment commitment in appendix C, I'll provide a bit more detail about the separate mitigation trust, which will be established by appendix D.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: For appendix D, the mitigation -- the environmental mitigation trust, VW is required to pay $2.7 billion nationally into a trust with about 800 and -- sorry -- 381 million allocated to California.

This money is intended to fully mitigate the total lifetime excess NOx emissions resulting from the illegal defeat devices in the 2 liter diesel vehicles. The trust will fund specified mitigation actions to replace older, dirtier heavy-duty vehicles and equipment with cleaner vehicles and equipment.

The consent decree specifies 9 eligible mitigation action categories that can be funded. They

include scrap and replace funding for on-road, freight, and drayage trucks, transit, shuttle, and school buses, ferries and tugs and off-road freight equipment, shore power for ocean-going vessels, and about 15 percent -- or up to 15 percent of the trust may be used to fund light-duty electric vehicle charging stations and hydrogen refueling stations.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The Governor will identify a lead agency to act on the State's behalf in implementing California's allocation of the trust. Once the Governor has identified a lead agency, that agency's tasks will include:

Developing a thorough public process of beneficiary mitigation plan, that describes the overall use of funds; implementing the beneficiary mitigation plan, and the mitigation actions identified in the plan; and submitting semi-annual reports to the trustee on the implementation status of the mitigation actions.

A trustee is expected to be in place by, and mitigation trust is expected to be effective, in early 2017, potentially in February.

VW will deposit the required funds in 3 equal installments. The first installment was made in late November. We will return to the Board in 2017 with a

status update on appendix D.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: I'll turn now to a focus on appendix C, the ZEV investment commitment in California. To start off, I'd like to provide a sense for the framework ARB used when considering the ZEV investment commitment portion of the agreement last spring.

ARB wanted the ZEV commitment to support the growth of the ZEV market in California, and to do so by increasing infrastructure and awareness, 2 factors that have been shown to be fundamental to growing the ZEV market.

Consumers will not buy a ZEV if they don't know about them, and if they don't know where to -- they will fuel them. ARB will also -- also wanted the commitment to increase access to ZEVs across broader income sectors of California. Our guiding principles going into this agreement were shaped by:

The Governor's ZEV Action Plan; SB 350, calling for greater transportation electrification and increased access to ZEV transportation options for low income customers, including those in disadvantaged communities;

SB 1275, the 2014 Charge Ahead California initiative, to bring 1 million electric cars, trucks, and

buses to California over the next decade, and ensure that low income Californians who are disproportionately impacted by air pollution benefit from the transition to a clean transportation sector;

And SB 535, which also identifies the need to provide benefits from greenhouse gas emission reduction programs to disadvantaged communities.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Now, turing to the content of approved agreement, the ZEV investment commitment in appendix C includes the following:

A commitment to invest $2 billion over a 10-year period in ZEV-related programs. Of that $2 billion, $800 million will be invested in California. The investments will be carried out in four 30-month spending cycles. For each ZEV investment cycle, a plan will be submitted to ARB for review and approval, and the investments made will be reviewed annually by ARB and the third-party auditor.

The goals of the investment plan laid out in the consent decree, include supporting increased use of ZEV technology in the U.S. through investments that promote and advance the use and availability of ZEVs, investments that address an existing need or supporting a reasonably anticipated need, and investments that build or increase

public awareness of and access to ZEVs, which could include increasing access to low and moderate income consumers and disadvantaged communities.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The consent decree establishes 4 investment categories that support the goals of appendix C. These include ZEV infrastructure, brand-neutral education and public awareness campaigns, ZEV access programs, and a green city initiative. I'll walk through each of these in more detail on the following slides.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: In spending category 1, Volkswagen is allowed to propose investment projects in ZEV infrastructure. Eligible investment costs include design, planning, construction, installation, operation, and maintenance of ZEV infrastructure. This infrastructure installed should support and advance the use of ZEVs. And these installations may include:

Level 2 chargers at multi-unit dwellings, workplaces, and public sites; DC fast charger facilities accessible to all vehicles utilizing non-proprietary connectors; new heavy-duty ZEV fueling facilities; later generation charging technologies including high power DC

fast chargers, or wireless charging; and, ZEV fueling stations such as hydrogen refueling stations.

To help VW come up to speed in California's ZEV infrastructure landscape, ARB staff have introduced VW to the staff at the California Public Utilities Commission, the California Energy Commission, and GO-Biz. Staff have also made Volkswagen aware of the California readiness plans to assist them in siting charging infrastructure.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: In spending category 2, Volkswagen may invest in education and outreach programs. As we've learned from a number of studies, consumer awareness of ZEVs is very low. This is a clear barrier to growing the ZEV market. VW's education and outreach campaign investments are to be brand neutral efforts to increase public awareness while not featuring favoring or advertising VW's vehicles or services.

On the other hand, the consent decree does allow awareness campaigns materials to include the statement sponsored by Volkswagen, though it may not be prominently displayed.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The third investment category is increasing ZEV access. These investment projects are programs or actions that increase

public exposure or access to ZEVs. They may include programs that provide access to ZEVs without requiring purchase or lease of a ZEV. Example projects in this category include scrap and replace programs with a ZEV replacement -- this is an example program exclusive to California, ZEVS used in a car share program, ride-hailing services, and in the future, autonomous vehicle services.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The final investment category is the Green City initiative. This 4th category is exclusive to California also. The Green City initiative is envisioned as a concentrated implementation of many of the investment types we've already described, infrastructure, public awareness, and ZEV access. Examples called out in the consent decree include ZEV car-sharing services, ZEV transit services, and ZEV freight transport projects.

We had a few questions during our workshop asking about the scope of Green City projects. So I wanted to be clear that although a Green City program could include a broad portfolio of environmentally beneficial transportation projects, only elements of the program that are specific to zero emission vehicles and supporting technology can count toward the VW ZEV investment obligation.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: That wraps up the summary of what is contained in the ZEV Investment commitment. I'd like to talk now about the advice and guidance ARB currently plans to provide to VW as they develop their first ZEV investment plan proposal.

This is where the engagement with the public and our sister State agencies is and will continue to be reflected as it is finalized. Taking into consideration the comments from our public workshop, guidance provided here today, and from the written comments received through our open docket, we will compile a final guidance document to be shared with VW and posted on our website.

We expect VW to consider the guidance provided in developing their ZEV investment plan proposal, as it will reflect the goals and terms of appendix C, as well as the State's needs, priorities, and policy directions related to the programs that support the ZEV market.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: As identified in the Governor's ZEV action plan, ZEV infrastructure and public awareness are key to growing the ZEV market. As I said earlier in the presentation, if consumers don't know about the cars, and don't know where to fuel them, they won't buy them or lease them or use

them.

For this reason, we are identifying the first 2 investment categories as top priorities for the first 30-month investment plan. We also urge VW to make early visible progress on these 2 categories in the first investment plan. We would like to be able to count ZEV fueling stations and measure the public awareness campaign reach by the end of the first 30 months, rather than receive reports of planned fueling sites and planned outreach efforts.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: We expect the investments VW makes to be additional and complementary to the investments being made by government and the private sector. We recognize that there are many program and efforts that are resulting in infrastructure development, public awareness growth, and ZEV access. These include CEC's infrastructure grants, the utilities program to invest in ZEV infrastructure, the substantial private sector investment in growing charger networks, and numerous local and multi-stakeholder efforts to support the ZEV market.

These should continue and VW's investment should grow the effort, making it bigger or broader, rather than take the place of existing programs.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The VW ZEV investment commitment has the potential to contribute to real transformation in California. We urge VW to think of that transformational change in 2 ways, first by making their investments in transformational technology, and to help move infrastructure and ZEV access to the next level.

Secondly, while the consent decree specifically requires that VW invest across a variety of geographic regions in the state. We urge VW to focus their investments in a limited number of communities that represent a variety of community types. Rather than a sprinkling of projects all over the State, we'd like to see enough investment in targeted communities to make a significant difference.

These investments have the potential to transform communities, particularly disadvantaged communities.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: And that brings me to our next recommendation. As one of the goals of the ZEV investment commitment is to increase access to ZEVs, it is important to make ZEVs a more accessible and attractive option for broader income groups within California. Therefore, we urge significant investments that are in and serve disadvantaged and low income

communities, particularly in infrastructure and access programs.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Although VW has expressed more interest in plug-in technologies, VW has many opportunities to invest in the early development of the hydrogen station network. Hydrogen infrastructure is important to California and achieves the goals of appendix C, because it supports technology diversity within our ZEV program, is scalable to larger vehicle types, today offers longer range and shorter refueling times, and as a result, assists with meeting our health based air quality standards and GHG goals.

Establishment of an efficient reliable and accessible fueling network will open up the market for fuel cell vehicles opening new opportunities for car makers, including VW, to successfully market zero emission vehicles.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Data collection and reporting will be important to achieving the terms and goals of appendix C for California in 2 fundamental ways for transparency and for learning. We need to be able to measure outcomes that result from the ZEV measure -- ZEV investments, how the goals of the ZEV

investment commitment have been met, as well as learn from the investments made.

We want to be able to track the effectiveness of programs and learn of any implementation durability or maintenance issues that arise. We also have the opportunity to inform future government funding programs from lessons learned through the set of investments. A good example of a technical area of learning is the implementation of vehicle grid integration projects. Should VW investments incorporate grid integration elements into their ZEV infrastructure, we look forward to working with them to further the development of the field to benefit California.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: We've received a number of comments from existing stakeholders indicating concern that the ZEV investments by VW may negatively impact the market in which they make their livelihood. We urge VW to make their investments in a way that does not interfere with or undermine established and emerging businesses in the marketplace.

Consistent with one of our first guiding principles, that investments be additive and complimentary, this principle more specifically urges VW to work well with others. Looking at California's needs

for infrastructure to meet our market goals, including the Governor's target of sufficient infrastructure to support 1 million ZEVs by 2020. We think there is plenty of opportunity for infrastructure investment for all players.

We also urge VW's investments to demonstrate social responsibility, and a full useful life sustainable business case. There are -- here, we are looking for thoughtful investment with good prospects for utilization, as well as long-term commitment to operations and maintenance support.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: I'll talk now about some of the priorities that we've identified for investment, as well as some examples of projects that we would recommend VW consider for investment that would achieve the goals of appendix C and support the ZEV market.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Based on the work we have done for the ZEV mid-term review's assessment of infrastructure needs, we've identified types of ZEV infrastructure in the following priority order:

One, multi-unit dwelling charging solutions to address the more challenging issues of providing at-home charging for those not living in a single-family home.

Workplace charging, including both level 1 and level 2. Workplace charging has multiple benefits, including expanding daily range for drivers, increasing awareness of ZEVs, and providing charging for employees that may not have access to charging at home.

Three, DC fast chargers. As the State has quite a bit of activity underway to fill out major corridors between metropolitan areas, we recommend DC fast-charger locations that serves secondary corridors and metropolitan sites that serve those drivers that may not have access to either workplace or home charging.

And public -- and fourth, public charging stations, especially at long dwell time locations like airports, medical facilities and office complexes.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: We also urge VW to consider infrastructure investments in hydrogen fueling projects, including both stations and market support projects that assist with station commissioning and standards development.

And finally, we would support investment in infrastructure that serves multiple vehicle sectors, like medium- and heavy-duty vehicles.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Some

examples of infrastructure projects that California recommends under appendix C and that would be valuable to the State include:

One, a workplace charging challenge offering grants or support for installation of chargers at workplaces;

Two, DC fast charge plazas, a modular build-out of 50 to 150 kW charging plazas with multiple charge points with pre-built capacity to upgrade to 350 kW chargers. Such stations would help address customer charging needs for those with at-home -- without at-home or at-work charging options;

Three, VGI, vehicle grade integration, standard implementation to jump start the VGI market development;

Four, plug-in vehicle -- a plug-in vehicle garage concept to fully electrify a parking asset that could evolve over time to serve car sharing and networked car programs followed by an upgrade to serve dispatched autonomous ZEVs;

Five, explore models like Burbank's curbside charging installation chargers in or along with the new high-tech parking meters that accept credit cards.

Six, hydrogen station investments, including several -- noting that several automakers have already supported early hydrogen station development by partnering

with station providers and financial backing early stations.

These stations are also partly funded by the California Energy Commission;

And seven, hydrogen station network support. Projects to support the growing hydrogen station network is underway that will support businesses going forward, including station commissioning, services, and hydrogen quality testing services.

Investments in the development of these services will greatly assist the creation of a reliable and sustainable market.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: As talked about earlier, increasing public awareness of ZEVs is critical to growing the market. It is a large task that would benefit from leveraging the work of others and partnering to create a larger overall program. For this reason, we recommend VW work with and partner with existing stakeholder efforts to create public awareness campaigns.

We expect the public awareness campaign efforts to market the attributes of ZEVs in a way that builds interest with consumers. And we would like to see measurement of the total reach and details about the media

streams used.

Finally, driving a ZEV has been shown to be one of the most influential elements of a consumers decision to buy or lease a ZEV. For this reason, we urge VW to include experiential marketing, including a ride and drive opportunities and vehicle displays showcasing ZEVs.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Increasing access to ZEVs will be an important element -- oh, sorry. Missed a page.

Examples of the kinds of public awareness programs we would support, include the funding of a contractor to provide ride and drive experiences or offering challenge grants to other stakeholders to bring funding into broader cooperative outreach programs.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Increasing ZEV access will be an important element of the ZEV investment commitment to California. This investment category, in particular, has tremendous potential to bring the benefits of ZEVs to greater numbers of moderate and low income Californians. We would prioritize projects, especially those that serve disadvantaged communities as listed here:

Vehicle scrap and replace with a ZEV programs,

community-based car share programs, zero emission shuttle services and transit, ride hailing services, and finally autonomous ZEV services demonstrations.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: As described previously, the Green City initiative could bring together many of the investment types already described into a focused geographic implementation. We would expect the investment to be transformative for this community.

Based on the guiding principles I outlined already, we therefore recommend the following be used in selecting a green city:

VW should select a city identified as a disadvantaged community; there should be opportunities to improve transportation and vehicle emissions across multiple vehicle types; we urge VW to leverage existing transportation plans and community efforts; and, in the end that VW consider the level of impact that can be achieved with their investment.

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ECARS ASSISTANT DIVISION CHIEF BEVAN:

Additionally, we suggest the following should be considered as VW narrows their selection of the Green City:

A city that is neither too large to create transformation nor too small to benefit a significant population; there should be significant need to improve air quality; and ideal location will benefit disadvantaged communities within the selected city; we expect the city to have the economic and demographic mix to support the planned initiatives, so that services provided will be well used; and the selected city should have some geographic separation or travel patterns that can be well served by the types of services to be provided.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: In addition to infrastructure and raising awareness, we expect a Green City to include several increased ZEV access components, such as ZEV car sharing, and ZEV shuttle services or transit. We would also like to see ZEV freight services and integration of technology transforming elements like vehicle grid integration and incorporation of renewable energy into ZEV infrastructure installations.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: I'll turn now to our process and next steps.

We conducted a workshop in Sacramento last Friday, December 2nd. Approximately 130 stakeholders were

in attendance. The workshop was also webcast, and we understand many stakeholders watched remotely. After giving a presentation, much like what we have presented here today, we took about 2 hours of constructive comments and suggestions from attendees from a broad cross-section of stakeholders.

Some of the main themes expressed by participants included:

Strong support for electric vehicle infrastructure, in particular DC fast chargers and chargers for multi-unit dwellings;

Support was also expressed for the use of renewable energy;

Many stakeholde4rs brought up the need to invest in infrastructure and vehicle programs that support disadvantaged communities, citing SB 1550's metrics of 25 percent of GHG funds spent in disadvantaged communities with a further 10 percent of funds spent in low income communities. It was also suggested that VW investments create jobs in disadvantaged communities;

Numerous stakeholders encouraged VW to invest in hydrogen stations and welcomed ARB's commitment to remain technology neutral;

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Comments

on the value of outreach and education were mixed. On the one hand there were those who echoed the recommendation to support multi-stakeholder efforts, and others that argued that investment in infrastructure would be more effective than raising awareness of ZEVs than a marketing campaign;

Several EVSE providers commented on competitiveness issues, such as the need to ensure that VW does not give away chargers, that they work fairly with contractors, and that a level playing field is maintained;

Stakeholders urged ARB to maintain significant oversight throughout the implementation of the investment plans;

And several stakeholders described opportunities to support medium- and heavy-duty ZEVs through deployment of vehicles and through investment in infrastructure to serve medium- and heavy-duty ZEVs.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: Our timeline going forward, now that we have conducted a public workshop and with input from today's Board meeting will be to continue to solicit comments from the public through December 16th, at which point we will combine and summarize all input received and roll it into a guidance and recommendations document for Volkswagen.

We will share that document with VW and post it

to our implementation webpage in early January. VW meanwhile will be opening a public input process of their own on December 9th inviting the public to share their suggestions related to the ZEV investment commitment directly with VW.

VW's input process is being carried out on a nationwide -- on a nationwide basis and will help inform their national ZEV investment plan as well as California's.

VW will submit their draft ZEV investment plan to ARB by February 22nd, 2017.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The draft ZEV investment plan submitted in February will include proposed projects, estimated costs, a timeline for implementation, and an explanation of how each investment relates to the identified goals in the consent decree.

This first investment plan will outline planned investments totaling $200 million. ARB will review the draft plan for its adherence to the terms and goals of the consent decree, and approve it or disapprove it in whole or in part. If disapproved in part, VW has 10 days to meet and confer with ARB, and if VW submits a new version of the disapproved parts for ARB approval, the process repeats. If the plan is disapproved in whole, VW must

submit a new draft plan and the process then repeats.

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ECARS ASSISTANT DIVISION CHIEF BEVAN: The investments to be made by VW are coming at a critical time as the ZEV market ramps up in the coming years. These programs and services have the potential to be transformative and highly supportive of California's efforts to grow the ZEV market and broaden the reach of electrified transportation for all Californians.

Finally, we look forward to keeping the Board informed about the ZEV -- the VW ZEV investment commitment.

Thank you for the opportunity to provide this update. I'm happy to answer any questions.

CHAIR NICHOLS: Thanks, Analisa. And I'm sure there will be questions from the Board. We also have 8 individuals who have signed up to testify on this item as well. I just wanted to underscore a couple of points since I was directly involved in the discussions that led to the creation of this appendix, because I think it's -- it clearly has had an interesting galvanizing effect on people's thinking about what you could do with money to help build the ZEV market.

Fact number 1 is that the $800 million is more money than has ever been invested in the history of the

ZEV Program by the State of California, so it's a very large amount of money. We get so used to dealing with big figures, I think that we somehow -- sometimes have a hard time putting them in perspective, but it does have the potential to be transformative, if it's spent well and wisely.

Secondly, the idea behind this program was primarily to recognize the fact that by diverting attention from the move towards zero emission vehicles with their green diesel program, which turned out to be not quite as green as it was advertised, that Volkswagen did have an effect on the market, which was not a positive one, and therefore it is appropriate for them to be now investing in this area.

But we also knew at the time, and it's becoming -- there's more detail coming out recently. I'm not sure how much has been published that Volkswagen has every intention of becoming a major player in the zero emission vehicle market, that they themselves are going to be producing several new models of electric vehicles, in addition to the one that they have now, which is the Golf, which is the only -- as far as I know, their only electric car that's available today.

They probably will be replacing that with something else, but they're looking at different types of

models. So there's a sense, which is, I think, understandable, of, gosh, they -- you know, they did something bad, and now they're benefiting from it. And the fact is that this investment, if it's done well, will benefit Volkswagen. There's no question about that. It will help them, you know, be a big player in the market, assuming that they have good vehicles that people want to buy or lease, but it's also going to help the entire market.

And so I think I just wanted to kind of underscore the fact that I think our job in all of this is to counsel with them, and where necessary, you know, be more aggressive about the fact that the investments that they're putting out through this fund need to be things that really do support the market as a whole.

There's another whole piece of this that's happening at the national level. It's not being divided up among the states, at least there's no intention, as far as I know, of doing that. This is going to be managed by EPA.

And so we also need to be kind of looking to complement what's going on at the national level, with this program as well, even though there's some pieces that are -- some investments that are unique to California, because we are both farther along than other places, and

because we're -- because we are being acknowledged, I would say, for the role that this whole -- this whole diesel scandal had on our State -- the effect it had on our State. So I just wanted to sort of start with that.

Board members, do you want to hear from the public first and then we'll ask our questions?

Okay. Let's go to Michael Jarred then from the Assembly Committee on Natural Resources. There's another --

MR. JARRED: On the other side?

CHAIR NICHOLS: You have to go to the other side. Sorry. Yeah. Only one microphone there.

MR. JARRED: Good morning. Hi. I'd like to make some brief comments. On September 1st, several Assembly members sent the Governor a letter on the VW settlement. Among other things, they asked for a public process. So I just wanted to thank you for the workshop last week, for the discussion today, and for actively soliciting public comments. I think that's important and appreciated.

In the September letter, the members of the Assembly also requested a significant investment in the scrap and replace with ZEVs. We still feel that is important, and ask the Board to emphasize that.

And in addition, for the public awareness piece, we believe that it's important that we piggyback on the

new ZEV models with extended range, so that we're increasing public awareness that there's new cars coming to market with much longer ranges, and also that investments are integrated with other investments, such as infrastructure, and SB 1275 investments.

And then to also make it truly brand neutral, we think any public awareness campaign should be run by an independent third party, not by Volkswagen.

And then finally, I'd like to say that coordination with other infrastructure programs is important. And I think you guys are already working with the CPUC and the CEC, but to really look for those gaps and to try and fill those areas that will not only need public charging stations, but also will benefit other programs, such as the 1275 programs.

So with that, that's all I have to say.

Thank you very much

CHAIR NICHOLS: Thank you very much for participating.

Ryan Schuchard.

MR. SCHUCHARD: Put this somewhere where I can see it.

Okay. Thank you, Chairman Nichols and Board members for holding this important meeting. I'm Ryan Schuchard with CalStart who has been working for 24 years

to advance clean vehicle infrastructure programs in California.

First, let me just say thank you to ARB staff for distilling this very nice summary of ideas following the meeting last week and since. And I'd like to just offer 3 thoughts associated with appendix C.

First, California has established programs that support electric vehicle market growth, including CVRP, HVIP, and the recently announced Energy Commission program to award CVRP-like funding for infrastructure. And given the recent decrease in cap-and-trade funding, it will be extremely helpful if these funds can be used to support existing programs.

Relatedly, they could be used to support important brand neutral EV outreach, such as that through Veloz, the new version of the plug-in EV collaborative.

Second, we'd like to underline the need for funds to be additional and complimentary and not -- and to take care not to distort the market. We're concerned in particular about the risk that funds be used that would roll-out charging equipment that would be at a discounted price and undercut existing providers.

It is true that VW is legally required to set up a new entity to distribute these funds, but there's no requirement that it set-up an EVSP firm and use these

funds to compete against others.

And third, and finally, if it does become too difficult for VW to use these funds to help their competitors in the car industry to sell their products, we can appreciate that. And the good news that there are many ways in which the VW funds could be used to support the industry in other ways that's not anti-competitive.

Just a few examples to support medium- and heavy-duty programs like HVIP and transit agency funding, the AB 1275 program which supports the used car market, the new Energy Commission program that I mentioned in a statewide coordinated workplace charging program.

So, in conclusion, the EV sector will take off, if there's a level playing field, and firms are allowed to compete in a fair and equitable way. We just need to make sure that the funds don't distort the market or undercut current programs.

So with that, thanks very much. And CalStart stands ready as always to engage with ARB and VW to deploy these resources.

CHAIR NICHOLS: Thank you, Mr. Schuchard.

Mr. Sheehy.

Tom Sheehy.

MR. SHEEHY: Great. Thank you so much, Madam Chair and members of the California Air Resources Board,

and staff. It's great to be here this morning. Appreciate just a couple moments.

I listened carefully and looked at the agenda carefully and understand this is all about appendix C. I don't have a statement to make today, but I do have a couple of questions. And if there is any light that staff or Board members can shed, that would be wonderful.

With respect to the $381 million mitigation trust fund established under appendix D, do we know -- and I understand that a lead agency hasn't been appointed. I appreciate all that. But do we know if that trust fund will, in fact, exist in the State Treasury? That is my first question.

My second question is, do we believe that it will require appropriation by the California legislature in order for those funds to exit the mitigation trust fund? Is there any light on this that anybody here, staff, remembers could share? I think it would be very good information for us all to know.

CHAIR NICHOLS: Yes.

MR. SHEEHY: I apologize. I'm here with Greenberg Traurig. I'm sorry, Madam Chair.

CHAIR NICHOLS: Okay. Yes. I'll ask Ellen Peter, our chief counsel, to answer those questions.

CHIEF COUNSEL PETER: So with respect to the

trust, it is going to be a trust that's set up by -- with the approval of the court. A process is going on right now to pick the trustee. It will be a combination -- the people who would be eligible are people like, you know, Pricewaterhouse, you know, kind of companies that are out there doing, you know, other mitigation trusts.

There would be banks that would be eligible. We're at the beginning of the selection of the trustee and writing of the trust. We are -- ARB is in consultation with U.S. DOJ. But as I said, the judge in the case is going to set up the trust. And this is very typical as for other environmental trusts.

So the money -- the first payment was already made. It was made to the court $900 million. The trust will probably be set up in the first part of 2017. We don't know exactly, because the court proceeds at its own rate. The money will go directly from Volkswagen, the second two payments, and also this first one will be transferred by the court to the trustee.

Now, the trustee is going to have a couple of obligations. They're going to make sure that the money is spent in conjunction with appendix D. And there's a list of projects that was alluded to before. And so those projects are going -- are specified. How that actually is run is depending on the terms of the trust, what the court

wants to do, and what the trustee wants to do.

So the trustee is going to be investing the money, because this money is just not going to sit there. The trustee is going to make sure that the projects that are selected are audited. The trustee goes out and makes sure that the projects are implemented. But how the money actually flows is unknown. The 381 million will not come to the State of California directly. It will be deposited as part of the 3 separate payments totaling $2.7 billion into the trust. Our share, our allocation of 381 million was based on the number of 2 liter vehicles that were in California.

So that's how we got our share. And the shares are all laid out in appendix D. But how it actually goes, we know the money will not go directly to the State Treasury. It will go to the trust. And then how it disburses out through the legislature, that's somewhat up to the -- what the trustee and the court orders to do.

MR. SHEEHY: Thank you, Madam Chair. I understand. So as I understand counsel then, if the money is not going to be deposited into the State Treasury --

CHAIR NICHOLS: Correct.

MR. SHEEHY: -- we believe it will not require an appropriation by the California legislature in order for that money to come out.

CHIEF COUNSEL PETER: Basically, there's some options there, in terms of the appropriation. The Legislature could actually -- let me take a step back. The trustee has to only appropriate certain projects. So there's various mechanisms that could happen.

But, for example, the legislature could say in advance, we want to have the money go to the certain kinds of projects. And then that's what the lead agency submits to the trustee and they go through it.

But the trustee will not give money directly to the legislature and it's because in other states that once it goes to the legislature, it goes to the general fund. So it's set up specifically to not have the money go to any of the State Treasury. It's not just California. It's because they just have the -- that's just the way they run these environmental trusts.

The legislature has lots of opportunities to weigh in on what projects and to work with whoever the lead agency is, but there will not be unspecified money flowing from the trust to the State Treasury.

CHAIR NICHOLS: So in some fashion, California gets to direct how the money is spent, but we don't actually process it ourselves. It doesn't go through us, as I understand it.

MR. SHEEHY: Madam Chair, thank you very much.

That was an excellent answer. Very helpful. Thank you so much.

CHAIR NICHOLS: You're welcome. Happy to clarify.

Mr. Aprea.

MR. APREA: Good morning, Chairman -- Chairwoman Nichols and members of the Air Resources Board. And thank you for allowing me the opportunity to speak before you today.

My name is Marc Aprea with the firm of Aprea and Micheli. And I'm here today representing ChargePoint the world's largest and most open network of EV charging stations.

ChargePoint is headquartered in California -- Campbell, California and was founded 8 years ago. The EV charging industry today is vibrant, growing, competitive, with many different business models, technology platforms, incorporating significant innovation.

VW's zero emission vehicle investment fund and the potential to accelerate EV adoption and charging in California and across the country is tremendous. Yet, how the consent decree is implemented will determine whether the goal is met, or whether we will fall short.

While we support more investment and competition in EV infrastructure, the draft guiding principles

presented in the slides here today are not adequate in our opinion. This -- the draft states that investments should not interfere with or undermine established and emerging businesses in the marketplace.

And while ChargePoint appreciates the intent behind this language, we believe it does not go far enough. ChargePoint urges 3 specific additions to the guidance document.

First, investment must stimulate innovation competition and customer choice, in charging equipment networks and services, and be consistent with SB 350. The State, as a matter of policy, has determined in SB 350 that State agencies, when developing guidelines, shall stimulate competition, customer choice, and innovation. And so we're making a distinction between interfering with competition versus stimulating that.

CARB must ensure that there is a balancing test established to review the benefits of proposed investments, and the potential for any unfair market advantages or disruptions in the market.

The California Public Utilities Commission has used a balancing test to review utility pilot programs. We also believe that investment must be brand neutral. Now, while that's been stated in the guidance document, we want to make sure that either directly or through use of

customer information and data obtained through ownership of its own single charging network that VW investment should not advance its own vehicle offerings over those of competitors.

Finally, 3, investments in infrastructure should be provided to site hosts and third-parties as rebates for charging stations. There are well established rebate programs available in the State, including the clean vehicle rebate program for drivers and the LADWP EV charging rebate program for infrastructure.

Rebates are the best funded structure for allowing customers the ability to choose charging stations they want to use, enabling as many possible charging vendors and network providers to enter the market, and enabling a positive charging experience for all drivers.

Rebates would also encourage skin in the game, that is leverage private funding through a match or having the site host cover a portion of the charging station or its installation.

In conclusion, ChargePoint strongly believes that these elements are vital to allowing California to take a major step forward ensuring that EV charging marketplace remains robust, competitive, and on the cutting edge of technological innovation.

I want to thank you all for your time, and we're

happy to continue to work with your staff.

CHAIR NICHOLS: Thank you.

MR. BARRETT: Good morning. I'm Will Barrett with the American Lung Association in California. Our organization recently released a report on the health and climate benefits and challenges associated with vehicle pollution. We found that California faces about $15 billion a year in health -- public health and climate challenges each year due to the fleet of vehicles on the road today.

We're concerned. Obviously, intentionally adding to this burden represents an unbelievable betrayal of the public trust, and provides a greater support for the need for California strong ZEV commitments and investments.

Our study found that a widespread transition to ZEVs in the coming decades would spur billions of dollars in public health and climate benefits. And we think that moving forward, as the staff has laid out with California's specific ZEV solutions tailored to what we need here is critical.

Specifically, we appreciated the focus in the staff's presentation on early meaningful investments at the outset, and ensuring that the new investments made here are not displacing any investments that have already been made adding to existing programs.

A strong investment in disadvantaged communities consistent with California law making sure that the communities most impacted by pollution are going to benefit through this program.

Investing in medium- and heavy-duty infrastructure solutions, we want to see investments in ZEV trucks, freight solutions, transit buses and school buses. We think those are all important categories to include, as well as broadening the discussion to include hydrogen. We think that's an important element of the program, including both the ZEV charging and hydrogen infrastructure.

And finally, we support the strong emphasis on the public education campaign. The Lung Association is part of the California Plug-In Electric Vehicle Collaborative. We think this existing program is really well suited. And as they transition to the new Veloz nonprofit, we think that's an important foundation Veloz to consider for carrying forward this important work.

Similarly, we had a call yesterday with some of our partners in the New England states. We know that similar work is going on there. And we think that this momentum is building for good strong public education campaigns is vital.

Finally, I just wanted to say we continue to look

forward to working with you all to make sure as these investments go forward they're monitored, and that the promise that this scandal offers now is really carried out to the benefit of Californian's health in our environment. I want to make sure that the monitoring is there to make sure that we're actually getting the benefits that will be claimed.

So with that, just thank you all and Happy Holidays.

CHAIR NICHOLS: Thank you.

MR. KENNY: Hi. Good morning, Mary -- or Chair Nichols, members of the Board.

My name is Ryan Kenny. I'm with Clean Energy. We're the nation's largest provider of natural gas and renewable natural gas transportation fuel.

Just a quick comment. We're a little concerned that the investment decisions for appendix C are not mutually exclusive for appendix D. And it's a little early for investment decisions, but we're concerned about the spill-over from C maybe into D. And, of course, you know, we believe that the investment decisions 4d should actually focus on immediate reductions of NOx and focus on heavy-duty truck space, which, of source, is the largest emitter of NOx by percentage in the State.

So we do believe that the policies should focus

on a 0.02 NOx performance standard. That's technology and fuel neutral. And that the decisions that might be in C do not take up too much in D. That might end up happening. So with that, I thank you for your time.

CHAIR NICHOLS: Thank you.

MR. MAGAVERN: Good morning. Bill Magavern with Coalition for Clean Air. We appreciate all the work ARB has done on trying to redress the Volkswagen scandal, and have 3 major points to make this morning.

One is we urge ARB to use all of its authority under the consent decree to make sure that every penny of this investment is spent for the public interest in expanding zero emission vehicles and the infrastructure for them.

And we don't think that Volkswagen is a company that has earned the benefit of the doubt or any leeway, because let's remember the reason we're here is that they intentionally defrauded their customers, among whom I believe are at least 2 Board members.

(Laughter.)

MR. MAGAVERN: And even worse than that, they committed an assault on the health of millions of people, both in California and around the world. And they did that deliberately and knowingly.

So we think that you need to stay very involved.

And let me give an example of that. You have the principle that these investments should be additional and complimentary and also the consideration to avoid undermining existing and emerging businesses. And we completely agree with that. I think it's going to require sustained involvement by ARB to make sure that those principles are actually observed in the implementation.

Second point, we very much agree with the emphasis on expanding access to EVs and EV infrastructure for those communities that in the past have not enjoyed access to the cleanest vehicles.

And you're appropriately looking to the Charge Ahead law, SB 1275, as well as SB 350, and the laws on climate investments in disadvantaged communities SB 535, and recently updated with AB 1550. So appreciate your including those.

And I think we can look to programs like the light-duty equity pilot programs under the Charge Ahead law, like the popular scrappage and replace program, as well as we know that we need to make charging infrastructure more available in multi-family dwelling.

And thirdly, we support the inclusion of medium- and heavy-duty vehicles, because we know that, in addition to the light-duty sector, we very much need to electrify the heavy-duty sector buses and trucks. And these are

sources of a lot of the NOx, and, of course, NOx is the pollutant that Volkswagen most inflicted on us with what I believe actually is a crime. So I'm glad that criminal investigations are continuing and appreciate the work that you're doing here.

CHAIR NICHOLS: Thank you.

MS. VAZQUEZ: Good morning, Chair, and Board members. I just want to repeat what my colleagues from Coalition for Clean Air and American Lung just mentioned, but also add specifically and emphasize importance of really developing our secondary market. I know there has been mentioned of primary market in getting low to moderate income families, but we understand a lot of these consumers do not buy primary cars, so really looking into that.

And the data collection, I know there was mention of really having transparent data, but also, you know, I know it's an emerging market, but if we can focus our energies and research in that market and see how we can actually expand that for low to moderate income families, but also looking at the infrastructure within those communities, because one thing is getting them into vehicles, another thing actually getting them to understand how to charge these vehicles.

And as Bill just mentioned, really investing in

the heavy-duty sector, specifically on the bus fleet sector and our school buses that we're going to hearing in our next segment is how do we actually invest these monies. We understand it's a lot of money, but in the grand scheme of things, it's not really a lot in the next 10 years. So how do we actually have effective investments are going to really last beyond 2030 years of our life and really propelling this market to the next level.

And we just look -- really look forward to really working with CARB staff and also really the transparency that we want from VW, and really making sure that whatever they indicate in their plans is transparent with the public, with really the consumers, but also individuals who are going to be benefiting from this, and really having them understand why it happened, and how we can actually prevent this from happening again.

So thank you.

CHAIR NICHOLS: Thank you. That concludes the list of witnesses. Is there anybody else who didn't sign up but wanted to speak?

Okay. Then let's turn back to the Board and I'll start this direction here.

Mr. Gioia.

BOARD MEMBER GIOIA: Thank you. I wanted to sort

of address my comments to one particular issue. And let me first say, I strongly support the guidance providing greater investment in disadvantaged communities. So -- and I realized it's guidance.

So what I wanted to raise is how we define disadvantaged communities. As I think many of us have seen, there have been some concerns expressed over the CalEnviroScreen tool across the State. I'm very familiar with the issues that have been raised from the Bay Area, both Congress -- the legislative delegation in the Bay Area, as well as by the Bay Area Air Quality Management District.

There's a number of communities in the Bay Area like West Oakland near the Port of Oakland, parts of East Oakland, portions of Richmond and other areas of San Jose, and -- that are very low income, disadvantaged communities under the definition that the local air district provides, but are not included within CalEnviroScreen. And I think that's true in other parts of the State as well.

So what I really would like to strongly suggest and sort of hear back from staff is that the guidance that we provide to Volkswagen expand the definition of disadvantaged communities. I don't want to repeat the specifics that were in the various letters. You all have that.

So that it is not limited -- I think this is an opportunity. We're not bound by the definition of the CalEnviroScreen tool in our guidance to Volkswagen, but we do want to have the investments be in disadvantaged communities.

There are number of disadvantaged communities not within the CalEnviroScreen, so we should expand it under some kind of criteria. So I'd like to hear from staff how they would anticipate doing that, and how they would convey that in their guidance document.

ECARS ASSISTANT DIVISION CHIEF BEVAN: We look forward to taking comment from folks who have suggestions in that area. Tools that could be useful for that.

BOARD MEMBER GIOIA: Right. I did -- I forwarded the letters that came from the Bay Area legislative delegation as well as the Bay Area Air Quality Management District --

ECARS ASSISTANT DIVISION CHIEF BEVAN: Okay. I'll look at those.

BOARD MEMBER GIOIA: -- the Metropolitan Transportation Commission that sort of lay out some specific criteria and suggestions.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Okay. Thank you. We'll look at those.

BOARD MEMBER GIOIA: So let me understand.

It's -- so we're not bound by the EnviroScreen. So you would -- how do we sort of make this clear to Volkswagen, if we do this?

ECARS ASSISTANT DIVISION CHIEF BEVAN: So we do want to give them guidance that they --

BOARD MEMBER GIOIA: Yes.

ECARS ASSISTANT DIVISION CHIEF BEVAN: -- invest in disadvantaged communities. And so it's going to be important for us to help them define what that is.

BOARD MEMBER GIOIA: Yes.

ECARS ASSISTANT DIVISION CHIEF BEVAN: You're right that we're not bound. The consent decree doesn't contemplate a definition of disadvantaged communities. So resources that we can look at, tools that we can use, and share with Volkswagen would be extremely helpful there and we'll reference those.

BOARD MEMBER GIOIA: So we could say, it meets, for example, the CalEnviroScreen communities plus these other communities under this critieria or definition.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Right, yes.

BOARD MEMBER GIOIA: Okay. And I'd like to sort of stay involved and see how you develop that and provide that. I mean -- or -- and you should be in contact with the Bay Area Air Quality Management District to hear from

them and get further, sort of, guidance on that.

ECARS ASSISTANT DIVISION CHIEF BEVAN: That's very helpful. Thank you.

BOARD MEMBER GIOIA: Thanks.

EXECUTIVE OFFICER COREY: Yeah, I just wanted to add, Supervisor, I think your perspective help on that would be really useful, and there is a very intentional reference here beyond SB 535 --

BOARD MEMBER GIOIA: Correct.

EXECUTIVE OFFICER COREY: -- with reference to 1550, which also had --

BOARD MEMBER GIOIA: Right.

EXECUTIVE OFFICER COREY: -- low income and other elements that were introduced. So there is some flexibility here, so that would be useful in your help.

BOARD MEMBER GIOIA: Great. Thank you.

CHAIR NICHOLS: Okay. Yes, Professor Sperling.

BOARD MEMBER SPERLING: I'd like to support the basic thrust of the agreement in terms of getting a lot of money into charging stations. I know there's a lot of concerns about competitiveness, but the reality is that it's -- there is not a good business model for building charging stations. You just can't make money out of it, unless you find some niches where you're going to charge extortionist rates.

So we need -- and here we are only -- at 3 percent market penetration in California, and we already don't have enough stations. They're not happening. They're not rolling out. The investments are not being made. The PUC is limiting what the utilities can do. You know, that's another related question. But at the end of the day, the number one priority should be getting money out there as the -- as Chairman Nichols was saying, getting money out there for these charging stations. That's our top priority. We're going to -- we're going to suffocate the market if we don't do that.

And it's consumer -- and consumers don't want to -- I mean, consumers won't buy a vehicle, unless they see the charging stations out there. They won't use them much, and that's why there's not a good business model there, but they need to see them out there so it's almost for psychological reasons and for market development.

So, you know, I want to really emphasize I think this -- what we're doing in terms of getting a lot of funding here for charging stations. That's unequivocally good.

CHAIR NICHOLS: I'll turn down to this direction. Yes, keep going.

Ms. Riordan.

BOARD MEMBER RIORDAN: Yes. I just wanted to

highlight one item that was addressed in the speaker category, which was the secondary market. And I have talked to staff -- and by the way, staff, this was an excellent outline, and I appreciate it very much.

A lot of the people I know in the area of where I am are going to look for the secondary market. There's just no question. We need to help them by providing some charging stations, as Dr. Sperling said, but we also -- and it's very difficult, but many of the people who live in the inland counties, i.e. the San Bernardino and Riverside counties, travel significant distances for their work.

So we've got to find out where these workplaces are or workplaces that may have the opportunities to also take in some charging stations, so that they can get back home, because they're going to be using those early items that -- or cars that may not have the range that they need. So I just want to hopefully encourage you. It's a difficult task, but to try to have Volkswagen, or maybe we even can provide some help to them, to figure out where these people are working.

A lot of them are traveling from 2 counties into L.A. County to work. They may be traveling also to Orange County, but I tend to think they're more apt to be traveling into L.A. County. And if we can find out what

those patterns are and establish some opportunities, perhaps some parking structures, perhaps in -- on the workplace for charging stations. I think that would help us tremendously in encouraging people to get into that secondary market.

Thank you.

CHAIR NICHOLS: Thanks. I think that's a very good comment. It also sort of builds on the earliest comment from Analisa about data and information, because this is an area where we all need better information, everybody who's involved in this market.

Senator Florez, I think you had your hand up next.

BOARD MEMBER FLOREZ: Yes. Thank you.

I agree with everything obviously everyone is saying. I have questions about the presentation and some questions about some of the slides.

One of the things that kind of transcended the presentation was this notion that we ought not reward Volkswagen for being a bad player by, in essence, giving them advertising or trying to be as much as brand neutral as possible. How do we really hone that in, in terms of our guidance principles?

At some point, during the presentation, it seemed to -- I think I caught in one sense we were saying things

should be balanced, but yet at the same time, we were giving them some notion of some sort of advertising. How do we balance that to make sure that people aren't pulling into a Volkswagen charging area, you know, in some way, and Volkswagen gets to reap the benefit of that?

ECARS ASSISTANT DIVISION CHIEF BEVAN: So on the education and outreach, that's sorts of the first primary area where we might think about them reaping benefit or being direct in --

BOARD MEMBER FLOREZ: I think it was the sponsored by that kind of took me. So, you know, yeah.

ECARS ASSISTANT DIVISION CHIEF BEVAN: So the education and outreach is intended to raise awareness and spark interest in zero emission vehicles. It can't feature prominent -- can't feature Volkswagen's products prominently, compared to other products that are included in the advertising or marketing, but it can, at the end, say brought to you by Volkswagen, but again not prominently.

So just a flash screen.

BOARD MEMBER FLOREZ: And it says sponsored by Mary Nichols or --

(Laughter.)

BOARD MEMBER FLOREZ: -- sponsored by the California Air Board? Or, you know, I mean --

(Laughter.)

CHAIR NICHOLS: Well, maybe I could -- I could add a little bit to this, because I think the idea here is that, at least from our perspective, we are trying to steer, as I think at least one of the people who spoke indicated, in the direction of putting the funds into a larger campaign. Both we and the east coast 177 states are working actively to try to create public outreach campaigns.

If that happens, when it happens, because I think it's really a when now, I think the understanding is that the campaign itself will have a brand name, but then the members will all get recognized. So presumably, Volkswagen would, along with it -- and by the way, the -- what I've heard -- maybe it's from you. So if I'm just repeating it back, okay -- is that Volkswagen prefers not to be the major sponsor of any of these efforts. They want to contribute, but they would prefer not to be the major donor, because that has some backlash potential as well.

ECARS ASSISTANT DIVISION CHIEF BEVAN: That would be in the case of the multi-stakeholder projects, like the PEVC Veloz program or the north east states public education campaign, right, they -- they're more likely to be interested in being a member of that with many partners

contributing. But the education and outreach campaign that they would undertake themselves would be in the form of raising awareness, telling folks these cars are available.

There are examples of the -- almost like a public service announcement, but then brought to you by Volkswagen at the end.

And then to your question --

BOARD MEMBER FLOREZ: Yeah, it's still -- now, we're back to zero then again.

(Laughter.)

BOARD MEMBER FLOREZ: So brought to you by Volkswagen. I'm just wondering -- I really like the approach that the Chairwoman just mentioned as some sort of larger campaign, or some sort of -- you know, there are other competitors. I think we had a few of them testify today about that worrisome aspect of it.

So as we begin to put out, if you will, for their consideration, as I understand it, I would hope that we would hone in on that larger campaign and try to minimize, as much as possible, kind of the Volkswagen EV charging stations, something of that sort.

ECARS ASSISTANT DIVISION CHIEF BEVAN: So that's a separate issue is the charging stations. And those can be owned, operated, and profited from by Volkswagen. And

the idea there, this kind of gets at the concept that I may not have been entirely clear about, that this isn't a penalty. This is urging them to invest in this marketplace in these services. And so they're creating a brand really in the infrastructure world. And --

BOARD MEMBER FLOREZ: But aren't we helping select some of these areas. You just mentioned some key areas that I think any competitor would love to be in. And are we giving them that opportunity to, because of the settlement, enter into those types of areas where competitors either aren't ready or about to do -- move into that area, and giving them sort of preferential treatment?

ECARS ASSISTANT DIVISION CHIEF BEVAN: I don't know that we're giving them any preferential treatment. We're guiding them using the same publicly available information that others have in terms of --

BOARD MEMBER FLOREZ: But we're saying we're going to do this in the first 30 months. I mean, it was pretty clearly stated that our preference in this entire deal is to get this effort pushed within the first investment period, which is the first 30 months. And I'm just wondering if that kind of pushes them out there as a kind of either a first adopter or an early entrant? I mean, how do we reconcile a very big push in the first

Investment period where they have to be ready and to move in that area where maybe competitors aren't going to be able, and we're actually asking them to be in preferential places, which we all agree are great places. So how do we balance that?

ECARS ASSISTANT DIVISION CHIEF BEVAN: That is an interesting balance. And we are asking them to find the gaps in California where other people aren't investing or that there is great need. And in some cases, those are going to take some time to develop the business case for and find the hosts, and really get projects underway.

But we are asking them to be as diligent and as quick as possible in getting started, because we do really want to be able to measure what's been accomplished after the first 30 months.

BOARD MEMBER FLOREZ: Okay. Just 2 more questions. I'm sorry. I guess just to end that part of the -- my thinking, and that is if we're rush -- if we're pushing for 30 -- a first investment period of 30 months, if we have a preference of where we think these areas should be, if we're asking Volkswagen to meet that, we, in some essence, are pushing them in a direction where others aren't, where others might want to be. And I just want to make sure they're not in a competitive advantage and -- to players who haven't been bad players in this space. So I

just don't want -- I just want to make sure we're not pushing them in some sort of preferential way to areas.

Two other questions I have. And then a request of the Chair and to the staff. Obviously, there was a congressional hearing on this yesterday. One of the issues was whether or not, at least debated there, was whether there was a market assessment. And it seemed to -- the EPA seemed to be saying there was no market assessment on their level. Have we done a market assessment yet in terms of how we view this area, or are we kind of stating, you know -- our preferences, are they base on a market assessment or --

ECARS ASSISTANT DIVISION CHIEF BEVAN: A market assessment of what? I'm sorry. I didn't -- I wasn't able to watch the --

BOARD MEMBER FLOREZ: Of kind of the EV -- the EV infrastructure --

CHAIR NICHOLS: The future of EVs and the need for infrastructure.

BOARD MEMBER FLOREZ: Right.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Okay. Sure. Well, we have the advantage of having been engaged in a mid-term review for the last 4 years.

BOARD MEMBER FLOREZ: Yeah.

ECARS ASSISTANT DIVISION CHIEF BEVAN: And I've

had early access to some of the findings, especially in infrastructure. And so our recommendations are informed by what we've identified in our mid-term review assessment.

BOARD MEMBER FLOREZ: Okay. Great. They could have used you yesterday at the hearing.

(Laughter.)

CHAIR NICHOLS: I'm sure.

BOARD MEMBER FLOREZ: The other question I have was the data question that was raised yesterday in yesterday's hearing about, you know, how transparent is data, how can we share data? I think you touched on that in a slide, but maybe you can give us our version of that kind of data look?

ECARS ASSISTANT DIVISION CHIEF BEVAN: We haven't determined yet exactly what we're going to be asking Volkswagen to provide us in the way of data, but we do certainly want to know where are the chargers, are they being used, what are the issues that has come -- that have come up in terms of reliability, durability, up-time, things like that, to inform both how effective their investments have been, but also what we can learn from them to share with other entities that are investing in infrastructure, as an example.

BOARD MEMBER FLOREZ: Okay. I guess what was

said yesterday at least was that they have a 1 year or annual data window. That's a long time to not be able to access data. And I'm just hoping that as we start to think of our data needs that we're not kind of locked into that 365 day nobody gets to see it except for Volkswagen. So I hope that we are going to look at that as well.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Yes. We actually meet with Volkswagen twice a year to check in on the status of their projects, and expect to be in relatively constant communication with them.

BOARD MEMBER FLOREZ: Okay. Great. Last request. I think the -- Madam Chair, the Pro Tem may have sent a letter requesting some information from staff regarding 350, all of the legislation you just kind of went through, and to make sure that's somehow coordinated and matching. And I would just hope we could get a response back to the Pro Tem. And the legislature generally will have the same questions at some point in time, so we might as well get ahead of it. So I'm just -- if that's possible, that would be great.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Yes, that's in progress.

BOARD MEMBER FLOREZ: Thank you.

CHAIR NICHOLS: Great. Ms. Mitchell.

BOARD MEMBER MITCHELL: Thank you.

So I understand from the requirements of appendix C that we won't have direct control over what happens with this investment money, but we will have some oversight, which I think we should exercise to the extent that we can.

A couple of things mentioned in the programs that I think would be important to emphasize, is the scrap and replace program. We already have the EFMP Plus-Up program. And a scrap and replace program that VW engages in could certainly build upon that program.

And also, Bill Magavern mentioned an important point is that when we are trying to get more EVs into disadvantaged communities, we really need to be thinking about the charging for those vehicles. And so it becomes even more important to find a solution to the multi-family dwelling charging problem. And that isn't easy, because, as you know, a lot of condominium owners have to have that connection directly to their condominium or to their apartment, so that they're charged for that electricity, so -- but there are other ways I think that it could be done with credit cards or with some other way to charge that electricity.

And I think it's really important that we kind of lead the way in some guidance on how that could be done. But those 2 things go together, the EVs into disadvantaged

communities and their ability to charge.

The other thing that I think we have neglected is the moving forward with electric vehicles in the medium-duty range. And there is so many tradesman out there that are using these medium-duty trucks or vans, and they are, at least in Southern California, all over, 4 or 5 or 6 counties to deliver whatever services or goods that they are engaged in.

And also we've seen the sales of these kinds of vehicles have just gone way up with low gasoline prices, but there aren't many models in that range. And I don't know how we get -- address that or whether this money would be a way to address it, but it's something we should keep in mind.

The other thing I think, which is included in our plan, which is important that we are technology neutral. The infrastructure for charging, et cetera is -- includes hydrogen. One thing that is mentioned in the plan is these EV charging corridors. That is going to be critical to moving an EV market forward.

And I know we've identified some of these corridors already, so I would hope that that would be included in our guidance to Volkswagen.

With respect to the Green City's program, I encourage the engagement of the League of California

Cities, and CSAC to help, you know, guide those programs into the right places. And those are wonderful resources, the League of Cities could certainly help. They already have their Beacon Program, their green program, which could be very useful, I think, to VW as they move in this direction.

Thank you.

CHAIR NICHOLS: Good comment.

Dr. Balmes.

BOARD MEMBER BALMES: Well, as one of those 2 board members --

(Laughter.)

BOARD MEMBER BALMES: -- with the dirty Volkswagen, I literally, Ms. Mitchell, can share, I literally just got my offer letter for what they're going to pay for me to sell it to them -- so let it back to them. I want to -- well, first of all, to say that coming late in the game here in terms of today's discussion, most of what I had to say has already been said. But there's one point that I think I would like to bring more attention to, and it was alluded to in Analisa's presentation about sort of the tension between increasing the market for EVs by building infrastructure, which I totally agree is important, versus an awareness campaign -- public awareness campaign.

And I personally don't have the expertise to say how important that latter pieces is, but I think it's important. And it's come up multiple times in our discussions. This is a great agency that comes up with evidence-based regulations, but communication with the public is not our strong suit.

(Laughter.)

BOARD MEMBER BALMES: And so I think -- I think there is a role here for that. My experience with public campaigns is on the public health side. And the smoking cessation campaigns in California have been very effective. And when they've been relatively defunded with changes of administration, smoking cessation rates have fallen. And then when resources have been put back into an effective campaign, cessation rates have increased. And I have to say effective campaign. It needs, you know, slick advertising, which, you know, Volkswagen clearly can do.

(Laughter.)

CHAIR NICHOLS: Probably better than we can.

BOARD MEMBER BALMES: I think so. But I think where I'm sort of publicly questioning is how much goes to building infrastructure? And I think that's -- you know, it's very important. And I'm not trying to say it's not, but I think we -- how much -- we need to question how much

needs to go into advertising? And I don't know how clear we are in that guidance to Volkswagen on this. I don't know if anyone wants to make a comment.

CHAIR NICHOLS: We haven't divided the money up into pots and said how much has to go to each of those, if that's the question.

BOARD MEMBER BALMES: Yeah. No, I wasn't asking for a dollar figure, but sort of balance.

DEPUTY EXECUTIVE OFFICER AYALA: So maybe I can just add a couple comments to give the Board some reassurance, because you pointed to evidence informing our process. And the two things that I want to point out is the infrastructure in education and awareness are two of the principal barriers that a significant amount of research done by places like UC Davis and other academic institutions have pointed out to us. So it's strictly and purely driven by the evidence that we have come across. So that is what is guiding our decisions.

And the other thing is absolutely we want to achieve the balance that Senator Florez was talking about, in terms of it's going to be part of the process. This is going to be an iteration where we want to engage with the company, with the Board, with the public. And we are anticipating dedicating, and hopefully getting new resources, so that we can begin this tracking process.

And that is one way that we achieve this balance that we understand we need to achieve. But to the point about how much goes to infrastructure versus education, we want to, as part of the process, identify the ideal solution for that. We think we need to do both. And we completely agree with you that the first thing that we'd recognize is that we are the worst at communicating.

(Laughter.)

DEPUTY EXECUTIVE OFFICER AYALA: And the first thing we did is said that we had to go and hire a essential professional, somebody who can actually help us with the social sciences and the -- you know, what I call, the human dimension, because, you know, as an engineer, I'll be the first to admit, you know, we can do great things, but communication is not our fore forté.

BOARD MEMBER BALMES: Yeah, so that's -- that's reassuring --

(Laughter.)

BOARD MEMBER BALMES: -- but, you know, what I fear is that we need a lot resources towards infrastructure. And, you know, if we just give just a little bit to the public messaging, you know, that will be sort of, excuse my phrase, pissing in the wind.

ECARS ASSISTANT DIVISION CHIEF BEVAN: Maybe I can help with a bit of context. With the federal program,

the national level, the consent decree actually establishes a range of funding for the 30 -- each 30-month cycle of 25 million minimum, and 50 million maximum. So on the national level, we expect to see at least 25 million spent on public awareness of the 2 billion divided by 4. So maybe that provides a bit of a context or a range or order of magnitude --

BOARD MEMBER BALMES: Yeah. Thank you.

ECARS ASSISTANT DIVISION CHIEF BEVAN: -- of a sense of what they're going to spend.

CHAIR NICHOLS: Any other comments?

Mr. Eisenhut.

BOARD MEMBER EISENHUT: Yeah. We may be at the end of this discussion, so -- but I had -- I wanted to add, I guess, I'm a Field of Dreams guy. And so I think that an emphasis -- I would endorse Dr. Sperling's comment with regard to an emphasis on infrastructure.

And a second point. With regard to disadvantaged communities, I hope this -- when we look at that definition, and the possibility of inclusion or exclusion of communities that that's a statewide look not a specifically regional look. So I just add that comment.

Thank you, Madam Chair.

CHAIR NICHOLS: Thank you.

Ms. Berg.

VICE CHAIR BERG: Thank you.

The things that really stuck out in my mind from Chairman Nichols and also from staff was transformative. This is really a significant amount of money. But from all my esteemed Board members, I think we've spent it 3 times.

(Laughter.)

VICE CHAIR BERG: And that's what my biggest concern is. If we truly want transformative, we're going to have to help VW be able to choose an area that -- or areas that truly could be transformative, which means somebody's going to get disappointed.

Otherwise, the other option is really being the belle of the ball with money that you can help a lot of different things go incremental. So I do think it's important that we do be very specific on what we want, because otherwise all is we're going to hear back is what VW didn't do right. And that's not fair.

So I would really, really encourage, not only the Board, but staff, to be very clear. Do we want to be transformative? Then you need to put significant funds after a transformative outcome.

Do you want to help be incremental? Then we can go broad and help many things get to the next level.

Thank you.

CHAIR NICHOLS: Thanks.

Yes, Dr. Sherriffs.

BOARD MEMBER SHERRIFFS: Thank you. Just thinking about some of the comments. You know, initially, well, it's great that VW has a long-term commitment to EV. You know, aligned incentives are very, very important. It also suggests though is that there's been a lot of expression of concern about reaching multi-family dwellings, about EJ communities. I don't know what VW's market is? And it's important, I think, that for this to succeed, and partly the comments about, you know, to be truly transformative, I think we have to be focused, because there's not enough to do a little bit everywhere.

So we need to understand what VW's focus is going to be and think about where are the gaps, and where are we good at filling those gaps. And likewise, well, how do we steer them, even though they may not want -- it's not their vision. Yeah, but this is not to reward them. We're not here to punish them, but, you know, we're here to make this for the public good, for the public health to make up for that deficit that's been created by this.

So I think to do this well, to be coordinated, we really do need to understand where their natural incentives are to be moving in a direction, and where the gaps are going to be.

CHAIR NICHOLS: I think that's a very good comment. I think we should probably wrap it up at this point, but I do want to just add, first of all, our Board Member Diane Takvorian, who was not able to be here today because of a scheduling conflict did send me some notes. And she wanted to both congratulate the staff on the report, which she thought did a really good job of capsulizing what was heard at the workshops, and also to add one additional point on the public awareness side, which is that it needs to include a multi-cultural and multi-lingual outreach component especially in order to reach disadvantaged communities. And just, in general, in the State of California, I think that has to be an aspect of anybody's marketing campaign.

I also wanted to really second Dr. Sperling's comment about the big gap between the amount of infrastructure that's out there, and the amount that is needed to support the kind of growth that we're talking, about, we are -- we have a drop in the bucket at the moment, in terms of what we're going to be needing.

So I -- despite the fact that I know there is the concern about competition and innovation, and we don't want to be stifling those in any way, shape, or form, I think our major objective is to get the infrastructure out there. And that's particularly true from the consumer

perspective that we -- our job, I think, is to be thinking about the consumer and the potential consumers are making this easy for them. And the existence of infrastructure is part of the marketing of these vehicles in and of itself, seeing the charging stations out there, especially if they're working charging stations and people are using them is part of what gets people interested in the possibility of acquiring or using one of these vehicles. So I think there's a -- there's a synergistic effect here.

Anyhow, as we heard before, this is an ongoing discussion, and a lot of interest. The workshop, I saw the photo from the workshop. It was standing room only. You know, great interest on the part of many different stakeholder groups. So this is exciting and we look forward to getting updates from you all on a regular basis.

So I think with that, we should move on to our next agenda item, since this is just an formation item. We didn't have to take any action on it.

We should move on to the school bus issue.

And this is one that I'm really glad is coming back before us. And I know several Board members have been very active in working to try to accelerate and expand our program in this area. I want to point out that, you know, we have still a population of old school

buses out there that are unfairly targeting children, while they are being transported to and from school, as well as people who are simply, in some cases, standing in front of the school while the bus is idling or dropping off kids at school. They are really noticeably one of the less well controlled types of vehicles that are out there on the roads today.

So back in June we asked the staff to give us an update on funding that would be available and ways that we could accelerate school bus projects. We heard testimony at that hearing about the potential, but wanted to pin down the facts of the situation and develop a strategy.

So, Mr. Corey, would you please kick off this item.

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair.

So as you noted, in June, the Board tasked staff with updating the California school bus population inventory and developing a plan to clean up remaining dirty school buses in the State. Staff is in that process and is providing this update.

Staff surveyed the California school bus population in close coordination with the California Association of School Transportation Officials, and the School Transportation Coalition, as well as other stakeholders.

Staff goal is to identify remaining dirty school buses and to develop a plan to clean them up. The primary goal of cleaning up the school bus fleet is to protect, as we know, children's health.

So as part of the staff presentation, Danielle Chambers of the Compliance Assistance and Outreach Branch as -- of the Mobile Source Control Division will present the staff presentation.

Danielle.

(Thereupon an overhead presentation was presented as follows.)

AIR POLLUTION SPECIALIST CHAMBERS: Thank you, Mr. Corey. And good morning, Chair Nichols and members of the Board.

Today, I'll provide an informational update on the status of the California school bus fleet.

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AIR POLLUTION SPECIALIST CHAMBERS: In June of 2016 at a Board hearing for low carbon transportation investments, testimony prompted a discussion about school buses that need to be replaced in California. The Board requested staff to come back to the Board with an update on the school bus population in California and a plan for addressing the dirty buses in the state, and funding resources available.

School bus cleanup in California is a broad issue, and effects not only air quality, but is also a societal responsibility to protect the health of our children. This is an opportunity to reduce direct pollutant exposure to children, while educating them with their first experience of public transportation through their daily commute to school.

Today, we will touch on children's health and exposure studies, the history of ARB's school bus programs, the current California school bus population, and the funding resources available.

We'll conclude with some of the challenges and the steps we need to take to continue California's school bus cleanup efforts.

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AIR POLLUTION SPECIALIST CHAMBERS: We know that particulate matter, or PM, adversely affects human health, especially the sensitive portions of our population, such as children. The Children's Health Study conducted in 1992, confirmed that exposure to high concentrations of PM reduces lung development, and not only does it have immediate adverse health effects, but with continued exposure has lasting adverse health effects later in life.

Continued research has shown, as with the Children's School Bus Exposure Study, conducted in 2003,

exposure is greatly affected by the bus's own exhaust and the oldest dirtiest buses have the highest rates of in-vehicle exposure.

Additionally, the ARB has sponsored mitigation studies to research additional ways to reduce in-cabin exposure.

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AIR POLLUTION SPECIALIST CHAMBERS: As a result of these findings, ARB took several actions to reduce children's exposure to vehicle-related pollutants during their school bus trips. Under the truck and bus regulation, all school buses are required to have a particulate matter exhaust filter, either original manufacturer equipped or retrofit, or they must operate less than 1,000 miles per year.

School buses of any fuel type are restricted from school bus idling at or near public or private schools. Drivers are required to turn off engines immediately upon arrival at a school, and restart no more than 30 seconds before departure. And finally, school bus fleets must regularly test for excessive smoke.

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AIR POLLUTION SPECIALIST CHAMBERS: In addition to regulatory measures in place to clean up school buses, ARB and air districts continue to invest funding in school

bus cleanup. This slide shows the major sources of State, federal, and local funding that has been allocated to school buses over the last 15 years.

The Lower Emission School Bus Program was established in 2001. ARB staff in coordination with the local air districts and the California Energy Commission developed guidelines that set the criteria for the program for school bus replacements and retrofits, with the goal of reducing children's exposure to harmful diesel exhaust.

The Zero Emission Bus Commercial Deployment Project was approved in October 2016 to advance technology in the school bus fleet, and has been allocated to fund 29 battery electric school buses in 3 Sacramento school districts.

To date, more than $500 million has been invested to clean up over 10,000 school buses.

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AIR POLLUTION SPECIALIST CHAMBERS: In order to determine how many school buses still need to be cleaned up, a variety of factors must be taken into account, including the age or model year of the school bus. We know, based on engine emission standards, that older school buses emit more particulate matter than newer school buses. We must also determine if the school bus has a particulate matter exhaust filter. Particulate

matter exhaust filters reduce PM emissions by at least 85 percent. And annual mileage tells us if buses operate reduced mileage on an annual basis. Therefore, they emit less PM.

Low-use school buses often serve as backups and are most commonly the oldest school buses in the fleet.

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AIR POLLUTION SPECIALIST CHAMBERS: To fully understand the inventory, we need multiple data sources to define the California school bus population. No one source gives us a clear answer of what needs to be done to clean up the school bus fleet. The 2014 CHP school bus inspection data is our primary data source for determining school bus population.

School buses are required to be inspected once every 13 months to legally transport children. This is our most complete data source, but we need more key information on retrofit PM filters and annual mileage.

To supplement the CHP inspection data, staff compiled information from other sources, such as lists of State funded school buses, and those funded through local air districts, information from the truck and bus regulation reporting system and DMV registration data.

Our last source was a direct attempt to get information directly from the school districts via a

school bus fleet survey.

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AIR POLLUTION SPECIALIST CHAMBERS: At the end of August 2016, ARB, the California Association of School Transportation Officials, or CASTO, and the School Transportation Coalition put together a school bus fleet survey for fleet and maintenance supervisors.

The survey was distributed to over 600 fleet supervisor contacts, as well as distributed in the CASTO monthly newsletter and through the California Department of Education contact list.

Staff followed up with phone calls to the transportation managers and emails to district superintendents. As of December 2nd, we have received approximately 250 surveys, which total approximately 7,200 school buses.

We will continue to compile survey responses into our final data set, as they come in.

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AIR POLLUTION SPECIALIST CHAMBERS: We know there are many stakeholders interested in school bus cleanup, so we reached out through a public forum and one-on-one meetings. We held a public workshop in early November, in which 188 participants were in attendance. At the workshop, we discussed and gathered input on preliminary

data results, current and potential funding sources, and cleanup prioritization.

In addition, we have held numerous one-on-one conference calls with various stakeholders, including local air districts and CAPCOA, school districts, school bus sales and retrofit installers, as well as several associations.

We appreciate the support and engagement from our school bus partners, and we look forward to ongoing cooperation and partnership.

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AIR POLLUTION SPECIALIST CHAMBERS: After compiling the school bus data sources, we broke down the school bus fleet of 25,400 school buses by fuel type. Approximately, 65 percent are diesel fueled, and make up our main area of focus and concern.

Obtaining more detail on the school bus fleet has helped us understand how we can prioritize the cleanup. We'll look at the school bus population in more detail on the next slide.

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AIR POLLUTION SPECIALIST CHAMBERS: This slide demonstrates the breakdown of the various categories that make up the school bus population in California. Let's start with the bottom 10 percent of the school bus

population. This is the portion in gray. We need more information to categorize these records. Key information is missing, such as gross vehicle weight rating fuel type, engine model year, or the compliance option.

As we continue to gather more data, we continue to see this category discrete -- decrease and disperse among the other categories.

The next category, shown in blue, makes up approximately 34 percent of the school bus population. This category includes fuel types, other than diesel, such as gasoline, natural gas, propane, hybrid, and electric school buses. These are not a primary concern for PM exposure.

Another 36 percent of the school bus population shown in green is made up of those diesel school buses that have PM exhaust filters installed, whether it be a retrofit or an original equipped filter that comes down standard 2007 and newer model year engines. Because these school buses have significant PM controls, they are not a priority for cleanup.

The next portion, shown in yellow, makes up 15 percent of the school bus population. This category includes those school buses that are currently in compliance with the truck and bus regulation, but are nearing the end of their useful life. While they are not

the highest priority for cleanup, they are an upcoming priority.

And finally, the top 5 percent, shown in, red designates the immediate priority category of school buses that are unfiltered. This is the dirtiest category of school buses in the fleet. We will talk about these last 2 categories in more detail on a later slide.

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AIR POLLUTION SPECIALIST CHAMBERS: Overall, California has made great progress to ensure that children have the opportunity to ride clean school buses to and from school. From the Children's Exposure School Bus Study to the regulations that are currently in place, along with the funding investments that have been directed to school buses, we have significantly accelerated the turnover of the school bus fleet, and have reduced PM exposure for children.

We need to focus on the 20 percent of the school bus population that includes the immediate and upcoming priority categories of school buses shown on the previous slide.

The data distribution shows us that school bus cleanup is a statewide issue, rather -- ranging throughout both rural and urban areas. Although a lot has been done to clean up the school bus fleet, school district, air

districts, and ARB still have more work to do.

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AIR POLLUTION SPECIALIST CHAMBERS: There is a wide range of project options for school bus cleanup. This slide shows the estimated cost for various school bus projects listed in order from the least expensive to the most expensive.

Projects range from $20,000 for a retrofit PM filter up to 130 to 185 thousand dollars for conventional replacements.

And finally, battery electric zero-emission school buses, ranging from 225 to 400 thousand dollars.

You can see that cleaner new technology options are available, as long as the funding resources are available.

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AIR POLLUTION SPECIALIST CHAMBERS: Based on the project costs that were listed on the previous slide, PM exhaust filters are the most cost effective option for cleaning up school buses. For comparison purposes, for every 1 conventional diesel school bus replacement, $165,000, 8 school buses could be retrofit at the cost of $20,000.

While everyone would prefer to get a new replacement bus, PM exhaust filters will continue to play

a role in cleaning up the school bus fleet where feasible.

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AIR POLLUTION SPECIALIST CHAMBERS: We will move on to some potential funding sources available to fund school bus projects. School districts have the ultimate responsibility for ensuring clean and healthy transportation for students. The funding sources on this slide represent air quality funding sources to support school districts in cleaning up their school bus fleet, including advancing technology.

The chart shows the potential funding sources and breaks down the amount of funding for each source, the project's types that the source will fund, and indicates if the funding source is designated only for school bus projects.

While each of these funding sources can be used to clean up school buses, each source has its own set of stipulations. Most of these sources fund more projects than just school buses, and school buses must compete against other priorities for funding.

I want to highlight the low carbon transportation investment funding, which is designed to promote clean transportation and reduce greenhouse gas emissions. In October of this year, $10 million was approved for the Rural School Bus Pilot Project. This funding source

prioritizes funding for advanced technology replacements in small air districts, but will also fund conventional replacements.

Because advanced technology projects are prioritized, and because of the high cost of technology, fewer school buses will be funded through this source, but will contribute to advancing the school bus fleet into the future. This is the only source listed that is exclusively dedicated to school bus projects.

Next, I will highlight the Carl Moyer funding, which is used at the discretion of the local air districts. Approximately 10 percent of the Carl Moyer funding is dedicated to the State reserve. ARB staff is currently coordinating with CAPCOA to determine how to use this funding in the 2017-2018 fiscal year. School bus projects are one potential project category. And we heard at the workshop held in November that many school districts want to understand ways to combine the various funding sources available. We will be working with the air districts and partner State agencies to foster this knowledge where possible, because many of these programs allow for co-funding and leveraging opportunities.

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AIR POLLUTION SPECIALIST CHAMBERS: The next part of this presentation, we will discuss the priorities we

identified earlier. The top 5 percent of the school bus fleet is an immediate priority, and an additional 15 percent is an upcoming priority that will require expeditious action over the next few years.

The minimum number of school buses listed in each category are estimates due to a portion of unknown data in our data set. These numbers may be higher than what is shown.

The estimated cleanup cost listed is based on conventional diesel replacements and PM filter retrofits, and does not take into account the use of advanced technology.

We will discuss each of these categories in more detail on the next 3 slides.

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AIR POLLUTION SPECIALIST CHAMBERS: We'll start by discussing the immediate priority school buses. This category includes those school buses that are compliant under the truck and bus regulation, but have received extensions, and therefore do not have PM exhaust filters installed.

This category includes those buses that have received an extension for either a recalled PM exhaust filter, and are currently awaiting the replacement filter substrate, and those buses in which there is no PM filter

technology available.

The filter recall extension will expire August 1, 2017, and the extension for no technology available willing expire January 1, 2018.

The timing makes this category a priority because once the extensions have expired, many of the State funding sources are no longer eligible due to legislative restrictions. For the school buses that had the recalled filter substrate, sufficient SEP funding is available to replace all the filters if the bus can accommodate a new retrofit.

However, due to physical restraints or exhaust characteristics, it is assumed that some buses cannot be retrofitted and those buses will need to be replaced. The total estimated cleanup cost includes the hire cost of replacing up to 50 percent of these buses.

The next steps include utilizing the existing school bus SEP, as well as encourage local air districts to prioritize and fund replacements of school buses that fall into this category.

For funding within ARB control, staff is looking for ways to frontload our expenditures to be able to replaces these school buses. There are various potential funding sources, but each have specific limitations and constraints on how and when the funding can be used.

Staff will continue to investigate all possible avenues to obtain the necessary funding in a timely manner.

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AIR POLLUTION SPECIALIST CHAMBERS: We will continue the second category of immediate priority school buses that are currently out of compliance with the truck and bus regulation. The vast majority of school buses are in compliance with the truck and bus rule. However, our recent analysis indicates about two and a half percent are out of compliance.

This category includes a handful of pre-1977 model year school buses, which had an earlier deadline to be replaced as of January 1, 2012, because these buses pre-date all federal safety standards for school buses. This category also includes buses that could be retrofit with a PM filter, but do not have one installed and have passed their compliance deadline of January 1, 2014.

The next steps for this category include working with local air districts and school districts to help bring them into compliance. The Enforcement Division is currently working with some school districts, some as a result of complaints from the public and will continue to work with non-compliant fleets to bring them into compliance.

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AIR POLLUTION SPECIALIST CHAMBERS: Finally, we will discuss the upcoming school bus cleanup priorities. This category of buses are compliant under the truck and bus regulation, but are approaching the end of their useful life.

The different types of school buses included here fall into 3 subcategories. Some are filtered 1994 and older buses, others are low-use buses that operate less than 1,000 miles per year, and finally, some are unfiltered lighter diesel buses.

Because the low-use buses in this category are typically the oldest and dirtiest school buses in the fleet, we want to encourage the turnover of these buses as soon as possible. This category must be taken into account now, because it could take some time to secure the funding necessary. Next steps include supporting school transportation advocates to secure school bus funding moving forward, in order to continue to advance the California school bus fleet.

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AIR POLLUTION SPECIALIST CHAMBERS: We must take into account the various challenges of cleaning up the school bus fleet. Overall, there is limited funding allocated to school transportation. Both school districts and air districts have multiple funding priorities. Air

districts cannot always prioritize school bus funding, because school buses are not usually the most cost effective projects.

In addition, not all air districts collect DMV fees. Therefore, local funding is not available for school bus projects in some districts. And because this SEP funding is variable from year to year, there is not a guaranteed amount each year for school bus cleanup. ARB has a limited role in influencing these challenges.

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AIR POLLUTION SPECIALIST CHAMBERS: In terms of what ARB can do, it's clear that we need to focus on cleaning up the unfiltered school buses that staff designated as an immediate priority. These are the redesignate categories on the slides you saw earlier.

We plan to continue to educate school bus officials on the school bus requirements, funding opportunities, and ways to combine or leverage funds available, continue to support the school bus SEP moving forward, as well as continue enforcement of the school bus provision of the truck and bus regulation.

ARB staff will promote clean technology and support opportunities to foster peer-to-peer knowledge sharing of fleet experiences with advanced technology. And we will assess the demand and encourage future

allocations of local carbon transportation funding, such as through the rural school bus pilot project.

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AIR POLLUTION SPECIALIST CHAMBERS: We know it's important to bring together all available resources to ensure clean transportation for the children of California, and working with our partners is critical in that effort. To that end, we plan to further refine our school bus inventory and share our findings with CAPCOA to determine appropriate funding opportunities. We will also encourage the designated lead agency of the VW mitigation funds to consider an allocation for clean school bus transportation.

And we plan to work with school transportation advocates to assist in efforts to secure school bus funding in the future.

We know that the school bus fleet will continuously need to be turned over and a sustained funding source for school bus transportation is the most ideal solution to address this issue. ARB staff are ready to help in any effort to establish more funding and are committed to cleaning up the California school bus fleet and make the fleet as clean as possible.

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AIR POLLUTION SPECIALIST CHAMBERS: This

concludes the presentation, and we'd be happy to answer any questions that you have.

CHAIR NICHOLS: Thank you.

I think you've done a really good job of assessing the situation and giving us the background information that we had requested, but I want to disagree slightly with one of the comments that you made. And that is that I think ARB does have a role to play in prioritizing this particular topic, bringing attention to it, and upping the level of concern. It's one of those things that we're making progress, we're working, and I know you are doing a lot to reach out to others, and I'm sure we're going to hear from some people who come forward in a minute about both the opportunities and the challenges, but I think this is going to take a much more concerted effort to really get some place in a reasonable period of time. And I'm impatient.

(Laughter.)

CHAIR NICHOLS: I also think the only way to really accelerate the progress in a meaningful way is to set some targets, and come up with a plan for meeting them, including sort of identifying what's needed, and then trying to figure out a way to go after the funds.

So this is an area which I think was really brought home last June by our 2 newest Board members who

have a specific focus and background on environmental justice. Both of them had really raised the issue of whether we were doing enough in this area. And so I'd like to invite Dean Florez to just say a few words, at this point, if you would.

BOARD MEMBER FLOREZ: Yeah, thank you. I do. Great presentation, by the way, and good analysis.

I would say one of the things we need to do with this analysis is really find an opportunity with our government affairs person here to proactively ask the legislature to hold a hearing on this.

I think we have really uncovered a lot of good data. The reason I say that is I did, at some point, put in legislation for bus cleanup way back in the day when we thought traps was the answer. And, you know, the world has moved so quickly from that point.

And I do agree with the Chairwoman that given your slide on the aging scale of these, it's a much more comprehensive problem than trying to just fund a swath of these, and somehow think that we're not going to have to continue to fund.

And, of course, the point on your slide that says that some air district don't offer that opportunity of dollars, given DMV fees, is another thought process that the legislature should really tackle in trying to figure a

more holistic way to do this.

I know it's probably too late to get into the Governor's State of the State, but I would say that this would be a great thing for the Governor's office to consider and lead and the transportation folks as well, along with the air districts.

So I would say for the Volkswagen settlement dollars we were just talking about earlier, I would say that that should be some part of this, and some mix of this. I'm not sure what that is, but it certainly doesn't solve the comprehensive problem, as the Chairwoman said, of what we're going to be doing with an aging fleet going forward, till we turn these all the way over.

And I will say that one of the comments made earlier that would be transformative is clearly, I think, what Diane and I were talking about. And really, we were stirred to action because our Chairwoman said I'm shocked that we have so many buses on the road that way. And so we kind of sprung into action, along with obviously the other Board members, who all see this as a very big win.

So I would just hope we would spend a little time. I know I will spend a little time with the legislature trying to figure out what their ongoing program should be. I think they have to be part and parcel of the solution.

And I just want to thank staff for doing a really thorough job. This is very pretty but deep dive, I think, as we've gotten into the subject.

CHAIR NICHOLS: Thank you.

Dr. Balmes.

BOARD MEMBER BALMES: Well, I just want to compliment staff on really an extent deep dive, as Senator Florez mentioned. This is the kind of response that we like to see when we ask for more information. I mean, this is just comprehensive. A couple of things that came up in my briefing. In terms of dollars per ton, this is an expensive kind of remediation program. But when you factor in the health -- the potential health benefits and savings and health costs, I think the scale tips the other way sort of big time, because we're talking about kids here, and their lifetime -- their lifecycle with regard to disease risk, growth of lung function, as you highlighted in terms of the Children's Health Study data.

If lungs don't fully develop as they can, then kids are at greater risk as adults for suffering disability from lung diseases later on.

So I think, if we get kind of pushback with regard to moving forward aggressively with regard to school bus remediation, we -- because it's expensive, we should keep the health costs and health benefits in mind.

And then the second thing was, there's a slice of buses that are gasoline. And I know in one of the slides that's bunched in with cleaner vehicles, CNG, and -- yeah, there we go -- what is it, 15 percent are gasoline. And, you know, I know they're cleaner than diesel, but they're not clean, especially if they're older gasoline buses. So that's just another thing to keep in mind.

You know, diesel should be the target initially, but I'd like to see the gasoline buses go the way of all flesh as well.

(Laughter.)

CHAIR NICHOLS: Thanks.

Yes, Dr. Sperling.

BOARD MEMBER SPERLING: So I want to follow up on those two comments. And, you know, I did enjoy and appreciate the deep dive, but I'm going to suggest a little deeper dive. I think we need to bring a little -- I mean, if we're going to -- if we're serious about this, we need to bring just a little bit more science to this.

And Dr. Balmes started down that path, but I think the first question is, you know, what percent of children are using school buses? And then, of those, are they disproportionately low income or not? I mean, is this even more of an EJ issue than we know or think?

CHAIR NICHOLS: That's fair.

BOARD MEMBER SPERLING: Number -- so that's the first question. The second one deals -- starts where Dr. Balmes was going and exposure levels. I mean, it would be good to understand a little bit. I know there's been a lot of research done. You know, what are the exposure levels, both inside the buses and outside the buses?

And that leads to that third question about cost effectiveness. And if, you know, conventional measures of cost effectiveness, as Dr. Balmes said, don't -- you know, are misleading, let's do some better way based on exposure and adjusted for age of the kids. And if it still comes out as not so cost effective, maybe we ought to be getting creative about finding some other solutions to this problem.

I mean, you know, replacing buses that go 1,000 miles a year, I mean, that -- or retrofitting it, you know, there's probably a reason they only go 1,000 miles a year. And so maybe we need some more creative thinking about how to go about it.

CHAIR NICHOLS: One of the most difficult issues that I've been involved with in my time on the Air Resources Board, and that -- that covers a lot of territory is a situation where there was some church run after school program in Long Beach run by a minister who had gotten very creative about getting kids from the

neighborhood and bringing them in for a very good quality after-school program. And the reason why he came to our attention is because he was transporting these kids in buses that had been de-accessioned from other fleets, because they were too dirty and they didn't meet any standards at all. And he was hoping to get an exemption from us or for the -- from the legislature to be allowed to continue to use these buses, because that was all he could afford to do.

You'll be happy to know that the mists of time have covered the actual ending of the story. I think we ended up giving him more time to solve this problem, and also work to try to help get him funding to get better buses, which is really what the answer was in the long run. I mean, I can help but think that with some of these that there are foundations out there, and charitable organizations that, if we were to help start this ball rolling and really identify the targets, would, you know, come in and buy a cleaner bus for people. It wouldn't all have to be done with Moyer funds or something like that.

Supervisor Gioia, you had your hand up.

BOARD MEMBER GIOIA: So just a question/comment. And I appreciate when I got some briefing on this in the -- before from the staff. I asked whether what we looked at were sort of dedicated bus fleets or fleets that

are under contract to school districts. And that's what this includes.

BOARD MEMBER SHERRIFFS: Uber buses.

BOARD MEMBER GIOIA: Pardon?

BOARD MEMBER SHERRIFFS: Uber buses.

BOARD MEMBER GIOIA: Right, uber. Those special buses.

(Laughter.)

BOARD MEMBER GIOIA: In many areas around the state, especially in urban areas, school bus service is really sometimes part of a fixed route service or other service by the local provider. And I know -- so this didn't really look at that fleet, as I understand it.

And many of those urban areas have bus systems that are, you know, high quality buses, and less polluting and all of that, but some don't, and it may be -- you know, and I'm less familiar with them. I'm familiar with the ones in the Bay Area. So how do we sort of get a handle and look at those school bus services that are provided by a -- by some type of bus agency that's not covered here. And are there any gaps there?

So do we -- how do we understand that area, because there's a lot of -- I mean, potentially there's a lot of kids in this State that do, you know, the districts don't have regular school buses like this. So how do we

look at those and understand where the gaps may exist there, and how do we help fund? Because I think those kids should not be at a disadvantage.

And, you know, we've heard so much from transit agencies the struggle to keep transit service. And so the extra cost of getting new zero emission buses or lower polluting buses is important, but it's costly. So how do we address that?

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI:

Yeah, I'm -- I think that's a really good point. And this goes along with the point that Dr. Sperling made. We did, maybe what you want to call is, the first level deep dive, but there are so many layers to this that are interesting and worth pursuing.

We've started a greater coordination with some of the school bus associations. And I think coming out of that is not only what we focused on today, a prioritization of where some of that initial funding should go, because we can clearly identify dirtier buses, but what does the future of school bus transportation look like? One of the areas that clearly came out of this is we may be able to come up with a solution to address that sort of immediate knead and catch up, if you will, but sustained funding is what's absolutely essential.

What does sustained funding look like, and how

does it address the broader school bus program? And it's one of those areas we'll have to have on our list to tackle.

BOARD MEMBER GIOIA: All right. So what's the plan to actually look at that?

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: Well, I think the plan is for us to have it on our list when we talk to the school bus associations and understand what is being done in this area. At this point, I don't --

BOARD MEMBER GIOIA: Or in talking with other bus agencies where you may not have a -- I don't know if they're part of -- like in the East Bay, AC Transit for example provides a lot of bus service. I don't know if they're part of a school bus association or not. So working through the normal transit associations as well.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: We will do that.

BOARD MEMBER GIOIA: Right. Thanks.

CHAIR NICHOLS: Yes.

BOARD MEMBER SHERRIFFS: Yeah, and I would just add it's great to hear -- we do need to dig even deeper in terms of the science. I think anecdotally, because I guess I'm here doing penance for my youngest daughter, who has asthma, and hated, hated riding in the school bus, and

also got headaches, and did not participate in some things, if she was going to have to ride on the school bus.

So it's a little hard to measure those kinds of things, but we do need to understand better the population that's using them, the direct as well as the indirect effects in order to build that coalition. And I'm glad that Senator Florez thinks --

CHAIR NICHOLS: What's your daughter's name?

BOARD MEMBER SHERRIFFS: -- we have that coalition in the legislature.

CHAIR NICHOLS: What's your daughter's -- what's your daughter's name?

BOARD MEMBER SHERRIFFS: What's her name?

CHAIR NICHOLS: Uh-huh.

BOARD MEMBER SHERRIFFS: Sarah.

CHAIR NICHOLS: Okay. So we call it Sarah's law.

(Laughter.)

CHAIR NICHOLS: And we use her picture.

BOARD MEMBER SHERRIFFS: She'll be thrilled. With an H. With an H.

(Laughter.)

CHAIR NICHOLS: Well, no, I'm teasing a little bit, but I do think that, you know, there's a -- there really is a human element to this. It's not just all

about statistics. And you're right, we need to find better measures of cost effectiveness as one of the outcomes of this project. So this again was an informational item, but it's an opportunity.

I'm sorry, one more -- two more actually. Just one. Okay.

BOARD MEMBER FLOREZ: I just have an additional request on the data --

CHAIR NICHOLS: Okay.

BOARD MEMBER FLOREZ: -- that Dr. Sperling had mentioned. One, and I can say this with maybe 14 years of -- I don't think we've ever had this deep of a dive on school buses, so I really, truly a believer in this particular cause. So I want to say going deeper, as Dr. Sperling mentioned, is absolutely vital. The deeper you can go and the more data sets you can provide, and the more data, I would just hope that we have an opportunity to have that at a legislative forum for policymakers who are going to be part and parcel of this on a non-bill, not a vote, not yes or no, not 10 minutes, but a proactive discussion about the State of the State of where the California Air Resources Board sees school buses going.

And I think it's a great opportunity for our board to interact with the legislature on an issue we've done a lot of research on, which I think they would be

very appreciative. So, one, I would hope we do that. I would also say Dr. Sperling's point -- I get back to what I was thinking about -- on those issues of EJ, I would start for every district that has a school -- a free school lunch program as kind of, you know, exactly where one might look at in terms of the ages of those particular buses. That always kind of leads me to a conclusion that sometimes I think is going to be correct, but sometimes isn't.

So I think Dr. Sperling is correct. I mean, my assumption would be all those free school lunch programs are devoid of, you know, any sort of good school bus, but you might be surprised. And so I'd like to hopefully be surprised once you dig into that data set.

CHAIR NICHOLS: Thank you.

Dr. Balmes.

BOARD MEMBER BALMES: Just one last point. I totally agree with Professor Sperling's desire to have more data. Again, it's one of the things I like about our agency is that we're data driven. I would say that -- that we do have information, which staff alluded to about exposures. You were asking for more exposure data. We know exposures on diesel -- old diesel buses it's bad. This agency has commissioned reports in this regard. And there have been independent studies from other groups as

well.

So I don't think we need a whole lot on exposure data in terms of old diesel buses. But how they're used is another story.

CHAIR NICHOLS: Okay. Thank you. We do have 6 people who actually said they wanted to speak to us on this topic. So if you want to come down, please, and we're -- we are being a bit slow this morning, but we welcome your comments as well.

MR. CHAVEZ: Honorable Board and staff, thank you for giving me the change to speak today.

I had something prepared. Well, first of all, I'm here on behalf of the School Transportation Coalition and the California Association of School Transportation Officials.

I just wanted to thank the staff for their work in putting together this study, and taking this deep dive into where school transportation fleet is today. And so going off the Board discussion on the question of the disadvantaged students and their -- how much they ride the buses, we've tried to put together studies -- statewide studies on figuring that out, but it's really hit or miss on getting that information from districts.

But one thing I have talked to on an anecdotal level from different districts is that the majority -- or

there's a higher rate of students disadvantaged who do ride those buses to school for, and other, anecdotal reasons as they tend to have parents who have work early in the morning, they can't take their kid to school. If there is a car in the family, that might be used. There's not two cars. Whereas, other more privileged families have the opportunity of taking their student off the bus and taking them to school, if there are some more emissions or other issues with the bus.

With that, I also wanted to just -- we just appreciate the information compiled in this presentation, and just putting all the information together on the existing funding sources, the cost of retrofits and replacement, and the breakdown of the current priority. That was -- that's very valuable for districts as there -- it helps them in their interest in addressing their own fleet needs.

I also applaud the staff in capturing the issues that the school transportation official face in addressing their feet -- fleet within the context of the competent -- competitive underfunded school district budget. Many times school districts are unaware of the information contained in this presentation. And if they do, and they are aware of the funding sources, they can lose out to other interested industries when they're trying to apply

for these funding sources.

So with that, we just encourage more specific funding sources for school districts, so they can competitively get those -- funding.

So with that, we just -- we just want to underscore the amount of resources that the staff put in to outreaching to the different school district fleet providers, and getting all that information together. They had a lot of calls, a lot of emails going out, just constant meeting with us, and making sure that everything was going as planned, and we were getting to the bottom of it.

With that, I just -- words can't express the full gratitude of the transportation community -- school transportation community, and the amount of focus and -- and in this investigation on school transportation in California.

With that, thank you.

CHAIR NICHOLS: Thank you. Thanks for being so responsive.

MR. ESSEX: Good morning, Chair Nichols, Board members and staff. I'm Matt Essex with A-Z Bus Sales and we're out of Colton in our Sacramento location here.

One question before I go into my prepared notes is to answer Dr. Sperling. One hundred percent of every

special needs child in this State is entitled to a ride to school.

Again, I don't know what that is in EJ, but, you know, that's a huge figure for our most fragile kids is they are all entitled. And I guarantee you there's a lot of old buses out there.

So Nico talked about the funding programs for school districts. And I can assure you they appreciate the funding for clean air school buses, especially since 2008. They also look forward to continuing this partnership with ARB to help clean up the air for kids.

Private school bus contractors transport a significant percentage of our kids as well, probably about 25 to 30 percent of them statewide. So that's around six to seven thousand buses out of the 25,400 that staff had talked about.

And a good proportion of those children are special needs, the ones we're just talking about. So right now there are no funding programs for private contractors, but history has shown a very large fleet in Southern California went from 0 to 30 percent using propane school buses, using a combination of differential and incentive funding provided by the local air district.

So we hope that the ARB can either help address this private contractor funding gap, either with funding

or helping to fund -- helping to leverage funding from other sources. Also, we know fuel neutrality is an ARB policy that gets us to our clean air goals faster. 2017 is going to see engines in production school buses that cert to the optional standards below 0.2 NOx today.

There are also funding projects in discussion to get even more school bus engines to cert all the way down to the 0.02 NOx level. Combining those 0.02 NOx engines with renewable fuels is going to help school buses -- or help school buses have fuel options other than electric to get to zero and near zero in the short term.

We continue to support the ARB and the clean air goals of the State. And thank you all for your time.

CHAIR NICHOLS: Thank you.

MS. VAZQUEZ: Good morning, Chair and Board members. My name is Diana Vazquez. I'm here on behalf of Sierra Club California, and just really trying to emphasize what we have talked about in the first segment is how do we actually invest these monies in a transformative way. And this is a perfect opportunity for these monies.

And I really want to repeat comments that were done by Dan Sterling[sic] and also Senator Florez is we need more data to really see where is the problems, and how we can actually help our more disadvantaged school

districts. And I'm really glad to hear the collaborative approach that CARB and the local air districts are working with the school districts. Been hearing a lot of lack of information, lack of access to the school districts. A lot of school districts are not thinking school buses, they're thinking other issues. But how do we help them to really elevate this measure.

And really, the comment that Chair Nichols mentioned is how do we actually start putting benchmarks. And just to give an overall view is we have been working with another coalition on advanced clean transit rule.

We -- the bus fleet in the school sector is double to the public transit fleet. And just to get something more -- just put it really in context is we're thinking -- we're really thinking about 25,000 buses. And then in the public sector we have 10,000 buses. So we can do it right in this sector. The rest of the sector is going to follow, and really looking at how do we actually leverage what we have right now to really establish something that's effective, because a lot of these schools are really depending on these buses.

But also, too, a lot of these school districts also contract these school buses for other means. So really looking at what are those other potential avenues that these school buses are actually getting into, because

the school district uses these buses as revenue. They actually contract with other third-party vendors. So just putting that in context and actually trying to get more information on how these buses are being used and what are the other forms that these buses are being used, other than the school districts.

Thank you.

CHAIR NICHOLS:

MS. ALAFIA: Good morning. My name is Joy Alafia. And I'm with the Western Propane Gas Association. Thank you for this opportunity to speak with you and for all the work that staff has done. I really appreciate it. And some of the information was enlightening even for us at our association.

I just want to highlight a couple of things about propane, and frankly where we are today, where we plan to be mid-term, and where we're looking to be long term post-2030, 2050, and how it aligns with some initiatives that you have at CARB.

So as was presented in the slides, propane has a very significant 6 percent market share of school buses. And it's in part because of the cost, but it's also because of lower greenhouse gas emissions, NOx emissions, particulate matter particularly when looking at -- at diesel.

And they also run quieter. We're heard from a lot of school bus drivers that they like the fact that they don't hear the loud roar. Instead, they're able to focus on the kids on their buses.

Near term, as was mentioned earlier, we're looking and pushing for some of the low NOx certification, so 0.05, very soon, and then 0.02. We're also, as an association, looking at -- this is a brand new thing for us as an association, but hybrid technology, plug-in hybrid opportunities with propane and electric.

Long term, we've committed to investing in renewables as well. We're looking at opportunities for biopropane. The National Renewable Energy Lab has produced a White Paper, and we plan to explore that even further. Biopropane is produced in the Netherlands, and we would like to make that commercially viable here in California.

So with that, I just wanted to paint the landscape of where propane is today and where we plan to be in the future, and hopes that we are eligible for continued support and funding from CARB.

Thank you.

CHAIR NICHOLS: Thanks for the update.

MR. JATKAR: Hi. Good morning, Chair Nichols and members of the Board. Shrayas Jatkar with Coalition for

Clean Air. I first wanted to thank the Board for elevating this issue back in June and directing staff to come back and share more information, and address the problem of school buses that continue to pollute at high levels -- at unacceptably high levels. And I want to thank the staff for the November workshop and involving the public and helping to figure out how we can overcome some of the challenges such as insufficient data, lack of funding, and look forward to continuing that discussion.

A couple of comments that I'll make. First is support what Chair Nichols had said about setting goals and a timeline for addressing this population of the dirtiest school buses. So while we do need more data, it is data, I think, to support that effort to create a good plan and identify good targets of the school buses that need to be cleaned up.

Second, is in terms of the criteria of how we prioritize this cleanup. It sort of perhaps goes without saying that, you know, looking at the emissions is most important as the place to start. And what we heard today is that not only looking at the age of the buses, but there's many factors because of how buses are used, so looking at mileage as well is very important, and thinking about how those buses are used.

I appreciate the comments about environmental

justice and disadvantaged communities. We think that it's appropriate to include that as part of the criteria of how these -- this cleanup is prioritized. And at the same Board meeting in June we heard that ARB's research showed that we have been effective at targeting cleanup in environmental justice communities. And we're achieving greater reductions in air pollutants in those EJ communities compared to non-EJ communities. Of course, pollution remains too high and greater in those EJ communities.

And then the last point is one that many of us have been talking about and I'm trying to figure out a different word than transformative or transformational, but it really is, I think, a good word to use here. But I would also just remind all of us that we support the State strategy to pursue zero emission technologies everywhere feasible. And near zero with low carbon renewable fuels everywhere else.

We think school buses, like transit, are ripe for electrification and that transformational change here is also moving towards replacement with zero emission buses. And, of course, we heard that there's a $7 million grant, 3 school districts in the Sacramento area. We should learn the lessons of that grant program to support greater and more widespread electrification of our school buses.

And lastly, I would just say that we should also think about other pilots that we could pursue in this area, such as vehicle-to-grid integration. These school buses are largely sitting idle for a lot of the time during the day, and there's more to be done perhaps on the sort of energy storage and vehicle to grid integration side. So thank you.

CHAIR NICHOLS: Great.

MS. NAGRANI: I'm Urvi Nagrani from Motiv Power Systems. And I wanted to thank you for bringing up this topic and having a good starting point to kind of delve into the data. There are a few key points, which I wanted to address in terms of how we can have more comprehensive date and analysis, beginning with how we talk about costs. When we were looking at the slide, which had the least expensive to most expensive solutions, that was upfront capital costs, specifically, and that did not include any of the operational costs, any of the maintenance costs, any of the long-term funding you would need to actually implement a solution.

This is very important, because if you're talking about, for example, a Class A school bus, you're looking at about $0.67 to $0.80 per mile cost of operation between your fuel, your maintenance, and ongoing work.

Meanwhile, with an electric, you're looking at

somewhere between $0.07 to $0.14. Now, that upfront capital cost looks like a huge barrier to entry, if you only see it as one cost as opposed to part of a total cost of an ownership model.

Now, that also has very different impacts for a school bus fleet that is managed by the school district, and has all of their operational costs in-house versus a private fleet, which might have access to private capital markets. So when we're looking at what is the cost and how can we act in that space, we have to keep in mind the financial constraints of who is operating the vehicle and how that impacts a deployment schedule.

And next point would be that specifically also you mentioned a large pool of funding, you showed some of the various areas that are both school bus specific and not. And I think there's a very key thing of while funding pools exist, the diversity of funding, the different constraints, and the different timelines create a knowledge barrier that makes it harder for school districts who don't have designated staff to chase after these monies to actually access them.

An easy first-come first-served approach that aligns with the school year helps fleets invest in a simple easily manageable way. If there are grants that the timeline kick-off, for example, with the recent CARB

grants for the City of Sacramento, and how that school bus deployment is going to work with Elk Grove and Twin Rivers, the delay in GGRF funds meant that we had to change the timelines. And the fact of the matter is all of those delays change whether or not a school bus goes into service at the beginning of the year. It impacts whether or not drivers are getting trained before the school year starts.

And when we're talking about a school district where your first goal is always going to be getting your kids to school. We have to be aware that we cannot add additional barriers to meeting that mission need.

And then lastly, I just wanted to caution you about using vehicle miles traveled as your key metric for usage. And the reason for that is a school district is going to put out however many buses they have to put out to get their kids to and from class. And one route might be many miles away and just do a few stops, and others might be doing a series of stops --

CHAIR NICHOLS: That's your time.

MS. NAGRANI: So hours of usage would be more appropriate. Thank you very much for your time.

CHAIR NICHOLS: Thank you. That was a very substantive presentation. And your comments about the way to calculate costs were very valid -- valuable. And I

think we will fold that into the thinking. So thank you.

We don't have any other witnesses signed up on this item. I don't think we need to say much more, other than to ask the staff to go back and pursue this item further.

BOARD MEMBER GIOIA: Can I -- Can I just add one more thing? Yes, one more comment after listening.

CHAIR NICHOLS: Go ahead.

BOARD MEMBER GIOIA: Thanks. I've spent a lot of time over the last 18 years working with local -- our local school district on transportation -- school transportation issues as a member of the Board of Supervisors and so, I've seen this problem firsthand for a long time.

And, you know, in the context mostly of a public system where there's public agency -- public transit agencies, but sometimes contracted services. And the message I hear over and over again, and I just want to amplify this is that this is a huge cost issue for schools. In fact, we worked on a program in the East Bay that developed free school bus funding for every kid in the school district on free or reduced lunch in a high school, in West Contra Costa. And then we funded it through a transportation sales tax.

And we heard over and over from school districts

about this challenge. So I just think it's really important to not put an extra cost burden on the school districts, who are already facing trying -- get students to school. We fund, even on our social service department, kids from low income families were having trouble paying for -- this is why did -- tried to do free bus service, pay for a bus to get to school, in missed school days.

So I just want to ensure that we're not doing something to force the school district to absorb a cost. Everything is a cost benefit, right? I mean, getting kids to school is their highest priority, and after-school programs, that was the other issue.

So I just want to just amplify that, and I appreciate hearing from folks from districts. And again, not to leave out those districts that have other school buses that aren't through the typical arrangements that we saw in this study.

CHAIR NICHOLS: Thanks. That's a useful perspective.

BOARD MEMBER SHERRIFFS: Can I? I'm sorry.

CHAIR NICHOLS: Did you want -- yes, please.

BOARD MEMBER SHERRIFFS: Just a couple. One, following up on that. Thinking about some of our revisitation and success with the truck and bus rule

thinking about capital costs and finding loan money, so that there are other solutions and other agencies that we need to look to to help with this problem.

And I just -- earlier discussions about how we're not very good communicators with the public. Well, a school bus emblazoned with, you know, low NOx, battery repowered, this is incredible advertising, an incredible way to tell the public that these technologies work. And I think they create pride in communities when people see these things, so that -- that's an important benefit that we need to think about as we move on these, is the advertising that -- the dollars that we gain.

CHAIR NICHOLS: Free advertising on buses.

Yes. Okay. Thanks. Does that conclude this?

Yes, it does okay. Let's take a short break for the court reporter, and everybody else to have a stretch and the staff to change places. And just come back in 10 minutes. Yeah, 10 minutes.

Thanks.

(Off record: 11:53 a.m.)

(Thereupon a recess was taken.)

(On record: 12:06 p.m.)

CHAIR NICHOLS: Okay. We're back in business.

Our next item is an update on the Supplemental Environmental Projects work that's been going on here at

the Board. This is another informational item, and it's from the Enforcement Division, which has been revising its policies on SEPs, as they call them, consistent with a new law that was passed in 2015.

Supplemental Environmental Projects, or SEPs, are intended to be environmentally beneficial projects that a person or an entity subject to an enforcement action can agree to undertake voluntarily as part of a settlement of the action and is a way to offset some portion of a civil penalty.

In late 2015, the legislature passed and the Governor signed AB 1071, which directed agencies within CalEPA to adopt a policy allowing the amount of a SEP to be up to 50 percent of the Enforcement Action. AB 1071 also required ARB to implement a public process to develop a SEP policy that benefits disadvantaged communities and to consider the relationship between the location of a violation and the location of the SEP.

Finally, AB 1071 requires ARB to make a list of eligible SEPs available to the public. So this is an update on the staff's work on this project.

And, Mr. Corey, would you introduce this item, please?

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair Nichols. So for the past 5 months, staff has held 14

workshops in 8 disadvantaged communities across the State soliciting input from community members and stakeholders to help formulate revisions to our Supplemental Environmental Projects policy. The revised policy we're presenting to you today describes the types of eligible SEP projects, preference criteria for prioritizing SEPs necessary and different ways in which SEPs may be funded.

We believe the proposed policy meets both the intent of AB 1071, and will lead to the funding of projects that will make a significant difference in disadvantaged communities. We'll also be presenting a list of eligible SEP proposals compiled from community members and stakeholders in disadvantaged communities.

Now, I'd like to introduce Michelle Shultz Wood who will begin the staff presentation.

Michelle.

(Thereupon and overhead presentation was presented as follows.)

AIR POLLUTION SPECIALIST SHULTZ WOOD: Thank you, Mr. Corey. And, good morning, Chair Nichols and members of the Board.

Today, I'll present staff's proposed Supplemental Environmental Projects policy, which updates ARB's current SEP policy to incorporate the requirements of AB 1071 signed into law last year.

In addition to the policy, I will discuss the proposed SEP process, the responsibilities of a SEP administrator, and summarize the types of proposals that we have received to date.

We are looking for your input today on the proposed policy and the implementation process. With that input, we will move forward, finalize the policy, and implement our new process.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: This slide provides an outline of what we will be discussing today. I will start with an introduction.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Our goal is to achieve compliance. We identify violations and work to reach a mutual settlement with the violator to resolve the case. Through the settlement process, we obtain compliance, assess penalties, and in many cases work with the violator to offset a portion of their penalty with a Supplemental Environmental Project, or SEP.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: The California Public Resources Code defines a SEP as an environmentally beneficial project that a person subject to an enforcement action voluntarily agrees to undertake

in settlement of the action and to offset a portion of their civil penalty.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Penalty money offset to SEPs within a given year will vary, based on the cases that are settled each year and the associated penalties. Because of AB 1071, and because we expect that many violators will choose to implement a SEP through the new proposed process, we expect SEP funding to be between $1 million and $5 million per year.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: The proposed SEP policy includes all of the following components specifically required by AB 1071:

A public process to solicit potential SEPs from disadvantaged communities; an increase in the maximum percentage of a penalty which a SEP may offset from 25 percent to 50 percent; a new requirement to keep a list of approved SEPs that may be selected to settle a portion of an enforcement action and to provide that list to Cal EPA annually. The first list of SEP proposals will be sent to CalEPA this month. And, consideration of the relationship between the location of the violation and the location of the proposed SEP with a focus on projects in disadvantaged communities.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Our goal today is to get your feedback on our proposed approach, including SEP selection and preference criteria. With your input and with input through our ongoing public process, we would implement the new policy.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: I will now talk about current Supplemental Environmental Projects.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: ARB currently funds 3 SEPs. They are: The California Council on Diesel Education and Technology, or CCDET, the School Bus and Diesel Emission Reduction Fund, and the Foundation for California Community Colleges Small Engine Maintenance and Repair Courses.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: The CCDET SEP was established in 2005 to support development and implementation of ARB's Heavy-Duty Vehicle Inspection Program and the Periodic Smoke Inspection Program through certifying opacity testers and diesel mechanics.

Today, it is a consortium of 6 community colleges that trains the next generation of diesel mechanics to maintain new technology diesel engines and vehicles.

Funding allows colleges to purchase engines, vehicles, software, and other materials for training purposes where they would not otherwise be able to do so.

These types of vocational programs have high expenses per student, and the SEP helps ensure robust training programs.

CCDET also certifies opacity testers for conducting tests consistent with cargo handling equipment regulations. These tests help ensure engine and after-treatment systems terms are functioning properly.

Finally, CCDET trains violators to comply with opacity requirements and conducts special projects, including the development of outreach materials for truck owners, operators, and mechanics on the importance of preventive maintenance.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: The School Bus and Diesel Emission Reduction SEP was created in 2011 to fund replacement filters for recalled Cleaire retrofit systems. Sufficient funding has now been collected to implement the replacement program. And this work is ongoing. The SEP also allows funding for vehicle replacements that go above and beyond regulatory requirements.

As discussed in the last item, significant

funding for school buses is needed. And while this SEP is helpful, SEP funds will not be sufficient by themselves to upgrade the school -- the statewide school bus fleet. School buses have been regulated through the Truck and Bus Rule since that rule was first adopted. Staff has successfully closed enforcement cases against school districts, which failed to meet regulatory requirements

Funding and enforcement efforts can work together to solve the school bus problem and protect children from exposure to diesel exhaust.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: ARB enforces the small off-road engine regulation and has settled numerous cases. Many of the companies involved in those settlements expressed interest in a SEP, but there was not an appropriate SEP with a nexus to small off-road engine settlements.

As a result, the Small Engine Maintenance and Repair Training SEP was established in 2014. The SEP is implemented through the Foundation for Community Colleges -- California Community Colleges, and fulfills the need to train future mechanics in the diagnosis and repair of small engines.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Next, I

will talk about community engagement.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: As we develop the updated SEP policy, we worked closely with residents and representatives disadvantaged communities. For the past year, we have dedicated staff to attend monthly Environmental Justice Taks Force meetings across the State to get an understanding of the enforcement issues within these communities, and to work through the task force to solve community issues. We used these meetings to get input on policy development.

In addition, we held 2 series of workshops to get input on project proposals and the updated SEP policy, including a total of 14 workshops in 8 locations, all of which had translation services provided. Our goal was to get as much input from disadvantaged communities as possible.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: This section describes our proposed SEP policy.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Our proposed SEP policy implements AB 1071. Implementing the policy will require a sustained commitment to a public process and a partnership with disadvantaged communities

to identify project proposals for funding. Under the policy, we would continuously solicit project proposals, post eligible SEPs to our website, and provide our list to CalEPA annually. CalEPA will maintain a library of eligible SEPs for all of the BDOs.

The policy defines SEP selection criteria and preference criteria to choose among SEPs, if necessary. It describes the categories of eligible SEPs and three methods by which SEPs can be funded.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Under the proposed policy, a SEP may be eligible if it meets all of the following criteria:

It furthers ARB's purpose by reducing the risk burden posed to public health, preventing future air quality problems or improving the injured environment.

The SEP has a nexus to the violation, either through location - the SEP improves air quality in the community where the violation occurred - or through the pollutant - the SEP improves air quality by addressing the pollutants involved in the violation.

Includes a detailed project proposal to ensure the project is technically, economically, and legally feasible.

The SEP does not benefit the violator.

And the SEP goes above and beyond regulatory requirements that are otherwise required by a federal, State, and/or local entity.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Nexus is an important part of the policy, and is used to match settlements to projects. Nexus is the relationship between the violation and the proposed project. Each violation occurs in a location and involves one or more pollutants.

Proposed projects and cases will be matched through location or pollutant by ARB as a part of the settlement process or by a SEP administrator after a penalty check has been deposited.

We believe that initially given the proposed projects received, there will be sufficient money to fund all projects, but the policy provides criteria should ranking become necessary in the future.

We also believe that projects in all geographic regions of the State will be fundable, because so many violations involving mobile sources have a statewide geographic nexus. For violations that have a strong location nexus, project funding will be considered where the violation occurred.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Under the proposed policy, ARB prefers SEPs that provide direct emissions or exposure reductions, benefit disadvantaged communities, provide community benefits, and/or provide multi-media benefits.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: A SEP proposal is required to be considered for funding. The SEP proposal will be reviewed to determine if the project meets the SEP policy criteria. The details of the proposal, such as the organization description and experience, project description, timeline, itemized budget and emissions benefit description will demonstrate if a SEP is technically, economically, and legally feasible.

Once the review is complete, and the SEP is determined to meet the requirements of the policy and is feasible, it will be added to the eligibility list. SEP proposals can be submitted on a continual basis. A SEP recipient can be anyone that submits a SEP proposal that meets the policy requirements.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: So far, we've received 14 proposals. Of these, one project will provide clear exposure reductions. The other projects would provide indirect emissions or exposure reductions at

varying levels, but would offer valuable community benefits. As we are evaluating each of these projects to ensure selection criteria are met, and to assure feasibility, we're confronting questions about which projects are truly appropriate for SEP funding.

For example, some projects would provide less air quality benefit, but provide improvements to community amenities. Park improvements, community gardens, and tree planting are examples.

In another example, some projects with broad community support would provide local scale air monitoring and/or educational programs, but would not provide direct emission reductions. The SEP selection and preference criteria will guide our decisions because they reflect the values that we, as an organization, place on different kinds of projects. We are interested in the Board's opinions about what types of projects we should value as most important.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: Once a settlement has been reached in an enforcement case, the violator will be asked to offset a portion of their penalties to fund a SEP as part of their settlement. If they agree to this, staff will ask them to choose a SEP from the eligibility list that has a nexus to the

violation as outlined in the SEP policy.

If they don't voluntarily agree to participate in a SEP, the entire penalty amount will go to the Air Pollution Control Fund. We believe, given a robust choice of SEPs, most violators will choose to participate. There are 3 ways that a SEP can be funded.

Our preference is to match case settlements directly to SEPs that can fully be funded. The violator will pay SEP money directly to the SEP recipient. When a SEP cannot be fully funded by the violator, they can deposit the SEP money into a SEP administrator's account. In this case, the SEP administrator will disburse the funds to the recipient.

The third option is for a violator to choose to design and implement a SEP themselves.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: When the violator has chose a SEP that can fully -- that can be fully funded by the offset penalty in their settlement, the violator pays their SEP money directly to the SEP recipient. In this case, the SEP recipient is liable for ensuring that the project is completed and is responsible for oversight, tracking, and reporting on the progress and completion of the SEP, as well as post-accounting expenditures to ARB.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: In cases where the offset penalty is not enough to fully fund a SEP on the eligibility list offered to the violator, the SEP money can be deposited into a SEP administrator's account. Currently, this is an option for the CCDET School Bus and Small Off-Road Engine SEPs. We are looking to establish a new SEP administrator for projects benefiting disadvantaged communities.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: A violator can also choose to design and implement a SEP themselves. In this case, the violator is liable through the completion of the SEP, as well as project oversight, tracking, and reporting to ARB. We do not anticipate that this option will be used very often, and typically see this happen about once a year.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: This section describes comments we received in the workshops and how we addressed them.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: During the workshops, we heard many comments from stakeholders. Communities want projects to improve the location where

violations have occurred, involve community members directly, support complimentary programs, and provide multi-media benefits.

Some stakeholders suggested we establish an advisory panel to review SEP eligibility. We believe the ongoing public process to implement this policy will serve this role, but we will continue to consider this idea as the policy is implemented.

Finally, many stakeholders believe violators should not play a role in project selection. We understand this concern, but under the law, violators must agree to a SEP.

Our role in the negotiating process is to guide violators to select among SEPs with an appropriate nexus to the violation. And our role in implementing this policy is to support disadvantaged communities in submitting SEP proposals that meet eligibility requirements.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: I will now summarize our presentation and discuss the next steps.

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AIR POLLUTION SPECIALIST SHULTZ WOOD: We believe the proposed policy meets the requirements of AB 1071, and sets the stage for funding new SEPs. We're interested in

your thoughts on the policy and proposed implementation. With your comments, we will finalize and implement the policy, provide a proposal list to CalEPA, and begin approving new SEPs.

We will be updating the Board annually on the implementation of the SEP program and the projects that have been funded.

Thank you.

CHAIR NICHOLS: Thank you. We have 2 witnesses who've signed up. If there's no comment from the staff, at this point, we'll turn to Brent Newell and Tiffany Eng.

MR. NEWELL: Thank you very much. Good afternoon Madam Chair, members of the Board. I rise to speak in support of the proposed SEP policy. It's implementing a law that directs funds to disadvantaged communities, yet also takes their project proposals as SEPs.

And the criteria for an acceptable SEP is written in such a way as to promote real community enhancements. The staff member who is making the Board presentation discussed parks. And there's one particular example that I'd like to highlight is a kind of SEP that is going to advance environmental justice by providing more access to parks and recreational opportunities in disadvantaged communities, yet also reduces the exposures that children will experience in disadvantaged communities.

It's a proposal in Rexland which is in Kern County. It has horrible air pollution, as you all know. And children who go to play soccer outdoors often face limitations from the air quality in the valley. You know, on bad air days, they're supposed to stay inside, right? Recess is canceled. This community wants an indoor soccer field constructed so that children in the community can go play soccer, not be affected by that horrible outdoor air pollution. They would not have to travel 20 miles to the nearest public soccer field in northeast Bakersfield. They would not have to go to a private soccer facility that charges $55 an hour, and requires them to come up with insurance -- liability insurance to use the soccer field.

So, you know, a project like this meets this very progressive SEP criteria, which not only requires that pollution be reduced, but exposures are reduced. Let's reduce exposures to children who want to be active and play soccer.

And it also directs benefits to communities like Rexland, where these kinds of facilities just don't exist. So a SEP policy that helps even the playing field when it comes to access to recreational facilities, but also protects children from exposures to harmful air pollutants.

So thank you very much

CHAIR NICHOLS: Thank you.

Tiffany.

MS. ENG: Hi. Good afternoon, Madam Chair, ARB Board members. My name is Tiffany Eng, and I'm here today on behalf of the California Environmental Justice Alliance, or CEJA.

I wanted to thank you for this opportunity to speak today, but also for the 2 workshops, both in August and October, that I participated in. It was a really good experience to give -- to both learn about the SEPs -- proposed draft SEPs policy and to give feedback.

The staff that you have are really great to work with. They addressed a lot of our concerns in response to our comments in a really practical manner, so we thank you for that effort.

We wanted to give a couple of points of feedback to the draft policy, mostly in -- as it attempts to fulfill the intent of AB 1071. We wanted to really emphasize the need to direct investments to the most disadvantaged communities affected by violations. And we know that ARB can do this by ensuring that SEPs prioritize the needs of disadvantaged communities first and foremost when approving of SEP projects.

First of all, we wanted to make sure that there's

a more nuanced and clear definition of community benefits in the criteria and guidelines. We know that is very open, but giving more definition would be really helpful, as well as benefiting disadvantaged communities, what exactly that could mean. We know that SEPs are intended to be direct, meaningful, and benefits that include community input or voices. So finding ways to have great community engagement and involvement or even partnership would be greatly appreciated.

Second, when SEP projects are listed on ARB's website -- and I think the ARB has done a really great job of doing that in the past -- of noticing the violator, the fine, and the project that's been addressed through the violation, if there could be descriptions of the SEP project with the amounts, and also have maybe even a public space to give feedback on certain SEP projects that community members can say which projects are really helpful to their neighborhoods or which might not be as helpful to the neighborhood. That could be a huge benefit to show that we really trying to have that nexus of linking SEPs to the projects that are most in need of being funded.

Third, while we understand that ARB will allow violators to propose and implement their own SEP, we, of course, highly discourage this on the record, mostly

because we really want to make sure benefits flow to environmental justice communities. And we want to see, if possible, ARB can kind of encourage SEP projects to be chosen that really do flow to EJ communities first and foremost.

Fourth, when ARB selects a third-party administrator, we hope that there will be 2 things. One is that third party administrator will have a lengthy and documented history of working with and partnering with environmental communities, and a history even of administering SEPs. We know that there's some foundations that have worked with different CalEPA agencies that are really great at doing that work, including certain foundations to make sure that those resources are flowing.

So we have a couple other comments I'll submit over a letter. But thank you so much for your time and we look forward to continue to work with you on this.

CHAIR NICHOLS: Thank you.

Well, thanks for your participation throughout the process. This is an opportunity if Board members have additional thoughts to weigh in at this point, or I'm sure you can give feedback to the staff also, but if you would like to make any comments.

Mr. Gioia.

BOARD MEMBER GIOIA: Sure. I just wanted to sort

of address 3 areas quickly. One, raise the same issue about how we define disadvantaged communities, as I mentioned on the earlier item, so I won't repeat that, because I don't think we're bound by the CalEnviroScreen.

Second, understanding that is -- is there a good faith effort always to try to find a disadvantaged community closest to where the violation occurred? How does that come out in the weighting policy. I mean, I think from an equity standpoint, the closer the use of the funds are to where the damage was done is really important. So if you can just briefly talk about that, I think that's an important criteria.

Third, the opportunity for community or citizen input and engagement in determining the SEPs.

ENFORCEMENT DIVISION CHIEF SAX: So, yes, I can answer. My name is Todd Sax. I can answer all 3 of those questions.

The first with relationship to defining disadvantaged communities, you are correct, AB 1071 doesn't reference CalEnviroScreen. And so we're looking at CalEnviroScreen as a measure of whether or not a community is a disadvantaged community, but a applicant, in their proposal is free to argue that they are benefiting a disadvantaged community, even if they don't fall within the confines of what CalEnviroScreen would

consider.

So we can go broader on that than CalEnviroScreen, and we're, I think, consistent with where you were coming from on the previous item.

With regards to your second question about a good faith effort for location, the answer is yes, there, will be a good faith effort on that. What's interesting about ARB violations that's different from violations at, for example, the Water Board or the Department of Toxics, is that a lot of our violations involve certification violations or trucking company violations, where a trucking company may operate all over the State.

BOARD MEMBER GIOIA: Right.

ENFORCEMENT DIVISION CHIEF SAX: And a certification violation could be sold anywhere in the State. And that cuts both ways for us. On the one hand, it provides less of a strong geographic nexus, on the other hand, it allows us to fund projects where there might not be very many violations.

Some of the areas we conducted workshops in were in the Imperial Valley and we don't typically see a lot of violations in those areas, but there are needs for funding there. And so we see opportunities to engage them on SEPs and potentially help support them through projects that have a statewide geographic nexus.

With your question with regards to citizen input we are committing to an ongoing public process to implement this. And so there will be ongoing opportunities for communities to participate through the ongoing workshops that we'll have to continue to drum up additional supplemental environmental project proposals.

BOARD MEMBER GIOIA: Thank you.

CHAIR NICHOLS: You know, it's difficult to -- I think you've covered the ground here well, and framed the issues. I think we're going to learn more in the application of the policy than we can -- we can't push much further in an abstract situation really until we're confronted with some choices and have an opportunity to kind of work them through. And I'm hoping that it may be even in the guidance or the policy itself, you could sort of commit to an evaluation based on, you know, year or 2 years worth of work to see how it -- how it comes out, because inevitably there will be things that come up that we haven't thought of.

CHAIR NICHOLS: Yes, Mr. Florez.

BOARD MEMBER FLOREZ: Maybe just on the comment that was our last presenter. So we have a pretty strongly worded letter from a member of our Committee. And I'm just wondering you said, Mr. Sax, that we're going to continue to continue to have ongoing conversations. Can

we make sure that we integrate a little bit of the EJAC concerns, as you move forward, just so we can go through them, and they feel a little more comfortable around -- about the connection between EJ communities and the work that you're doing, particularly around community benefit. I think it has been mentioned by the CEJA representative just to make sure we're in alignment there. I kind of get where you're going on it, but I think it would be great to see if we can get them a little more comfortable.

Thank you.

ENFORCEMENT DIVISION CHIEF SAX: (Nods head.)

CHAIR NICHOLS: Okay. Other comments?

If not, let's just thank you for the work and keeping us posted. I think I'm delighted to hear that there has been so much engagement with groups around the State, and that, generally speaking, not 100 percent but to a considerable extent, there has been strong support from the environmental justice groups for where you all are heading, as well as, of course, for the legislation itself. So it's nice to see that. Thanks.

ENFORCEMENT DIVISION CHIEF SAX: Thank you.

CHAIR NICHOLS: One more comment. Sorry, excuse me. Too close.

VICE CHAIR BERG: No. I just wanted to piggyback on our Chair comment. This is great for business as well.

This is a really good opportunity for business to participate and see the need of how important these projects are and what's going on in communities.

And so I'm very supportive from that perspective as well.

CHAIR NICHOLS. Okay Good point.

Okay. We have one more item, another informational item. This is a day for education and conversation. That's great.

So we're going to hear last about some of what the staff has been up to and thinking about carbon capture and sequestration.

Okay. So this is an update -- carbon capture and sequestration is, and has been really from the beginning of AB 32, one of the elements of our long-term climate strategy. As we work towards our 2020 goals, we're also looking at how we move beyond them and think further ahead, including to 2050.

And we have looked at a number of different studies and scenarios that indicate that, at some point after you've conserved, and changed fuels, and reduced emissions, that you still have a need to do something with the unavoidable emissions that are still going to be troubling us.

So this is something that continues to be

considered to be a critical area, and may well also turn out to be a way to save cost of achieving carbon reduction's ambitious goals, if -- if the technology works, and that's always the big if.

Just last month, the International Energy Agency released a report describing CCS as an integral part of implementing the Paris climate agreement, and highlighting the importance of carbon capture and sequestration to address power and industrial emissions, and outlining the necessity of this technology being utilized.

To many of us, it seems as though this has -- is a new and novel concept, and it has not been utilized to a great extent in California, despite efforts to identify potential projects. There actually are projects out there that have been in existence for many years, including one in Norway. And, of course, we have been seeing injection of carbon dioxide underground as part of enhanced oil recovery operations for many years really since the 1970s.

So it's a technology that is not unknown, but it isn't being deployed widely. And one of the major reasons for that is that there is no agreed upon strong accounting methodology for the benefits of these projects. So because of that, we've seen a absence of proposals for offsets coming in into our climate market for this kind of program.

There are a lot of applications for carbon capture and sequestration within fuel production industry and power generation that can reduce the impacts of fossil fuel use. And so it could be an important bridge to a lower carbon future. And it has the ability, clearly the potential, to yield some negative, even, carbon emissions.

So if California can find a way that meets all of our needs from an overall environmental perspective, and if we can do the accounting in a way that's satisfactory, this could be a very powerful way for California to continue its climate leadership. And because of that, we've committed to developing an accounting framework that would support the potential inclusion of carbon capture and sequestration projects in the climate program.

So today, this is an update on where the staff is on that project. It's not again being presented for any action today, but it's an opportunity for Board members to become familiar with what's going on in this area, as well as the public. And we'll -- we presumably will be hearing further on this in months to come.

So let's start now with the presentation. Mr. Corey, do you want to introduce it?

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair Nichols. So as we move towards our long-term greenhouse gas emission reduction goals, of 80 percent below 1990

levels by 2050, carbon capture and sequestration, or you'll be hearing it over and over, CCS, is widely considered a critical element to contain costs, address sources with few alternatives, and potentially, as the Chair noted, achieve negative emissions.

Staff has been beginning the work to develop a quantification methodology, which could be used by our climate programs and potentially other jurisdictions' programs to properly implement and account for reductions due to CCS.

This will allow California to continue its leading role in climate change mitigation and enable CCS projects in the short-term that will lay the groundwork for long-term widespread availability of CCS.

So far, staff efforts have been primarily focused on increasing knowledge and soliciting stakeholder concerns and public comments on the science, policy, and environmental and social impacts of CCS. Staff has completed initial workshops, technical discussions, stakeholder meetings, research and site visits.

I'll now ask Xuping Li from the Industrial Strategies Division to begin the staff presentation.

Xuping.

(Thereupon an overhead presentation was presented as follows.)

AIR RESOURCES ENGINEER LI: Thank you, Mr. Corey.

Good afternoon Chair Nichols, members of the Board. Today, I will be presenting an informational item on carbon capture and sequestration or CCS in short.

The objectives are to provide you background information on the technology, and update you on our progress and the plans on CCS related efforts over the next few years.

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AIR RESOURCES ENGINEER LI: As shown in this overview, we will cover several aspects of CCS today, including background, potential in California, and lessons learned from natural gas underground storage leaks, staff's design principles, and our next steps.

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AIR RESOURCES ENGINEER LI: California is a leader in climate reduction -- pollution reduction with ambitious greenhouse gas reduction goals. Carbon capture and sequestration is an important part of the state's overall long-term climate strategy. As we implement strategies to meet our 2030 goals, we must keep an eye on how we meet our 2050 goals. Many studies show that CCS is most likely necessary and can reduce costs to reach those goals.

As an example, last month the International

Energy Agency released a report describing CCS as an important part -- integral part of implementing the Paris climate agreement and highlighting the importance of CCS to address power and industrial emissions, and to deliver net negative carbon emissions.

Specific to California, the California Council on Science and Technology found almost all solutions to 2050 goals require CCS.

However, CCS projects have not been able to participate in California's climate programs due to the lack of quantification methodology, or QM.

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AIR RESOURCES ENGINEER LI: Recognizing the importance of CCS in the long-term, ARB has been following the technology and has recognized it in all ARB scoping plans. And in 2010, ARB along with the Energy Commission, and the Public Utilities Commission created a blue ribbon review panel to determine what was needed to allow and enable CCS in California.

Among other things, it concluded that ARB should be the lead agency to analyze and regulate greenhouse gas emission benefits from CCS projects. The remainder of their findings are available on our website -- webpage. In order to enable CCS projects to move forward, the Board and legislature have directed ARB and the staff to develop

a quantification methodology, which would define how CO2 reductions from CCS project should be accounted for in California's climate programs.

Staff has been spent the last -- the past year consulting with experts and coordinating with other State and federal agencies in preparation for development of the quantification methodology.

To date, we have held 6 technical discussion sessions with broad participation from industry, academia, and environmental organizations, including the Environmental Justice Advisory Committee. Staff will continue this engagement throughout the development process.

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AIR RESOURCES ENGINEER LI: This graph illustrates the different steps of CCS and CO2 utilization. First, CO2 is captured and compressed from large stationary sources, such as power plants, or industrial processes, including ethanol production, and gas processing.

A typical capture process for CCS is to flow the exhaust to gas from a combustion source, such as a power plant through a chemical solvent which separates and purifies the CO2 from the rest of the flue gas. Capture cost is the primary component of CCS cost, and capture the

cost largely depends on the composition of gas stream. Some industrial sources, such as ethanol production, have a stream of CO2 and water in the exhaust, and only require water removal to achieve pure CO2, which has a lower cost for a CO2 capture.

After CO2 is compressed, it is transported to a site where it can be utilized in a product or injected underground. One example of utilization is to use CO2 as a reagent in cement production. When injected underground, it is called geological sequestration. We will talk about this more on the next slide.

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AIR RESOURCES ENGINEER LI: This slide shows the multiple geological subsurface areas where CO2 can be sequestered. Generally, CO2 is injected either into deep saline reservoirs or active or depleted oil and gas reservoirs. These reservoirs tend to be thousands of feet beneath the surface deep enough that CO2 remains in place. A well designed injection site will have a thick impermeable layer above it, usually sale -- shale. So the CO2 cannot migrate to the surface due to buoyancy.

Most existing CCS projects deliver their CO2 to active oil fields, where CO2 is injected to enhance oil recovery. A portion of the CO2 injected is trapped in the pore space of the reservoir and cannot be recovered. The

rest of the injected CO2 is produced with the oil and can either be reinjected or sequestered or it can be transported and used in other injection projects.

We would like to point out that our current efforts are focused on geological sequestration of CO2, such as in saline reservoirs, or CO2 enhanced oil recovery projects. We plan to analyze and include utilization with CO2 during future efforts.

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AIR RESOURCES ENGINEER LI: CCS technology is currently available at commercial scale worldwide. None of the existing commercial scale CCS projects are in California, but some projects are associated with fuel production and may supply fuel to California market.

Currently, there are 20 commercial scale CCS projects with one commercial scale saline injection process in Norway on-line and injecting for about 20 years.

The combined injection rate of all the projects shown is about 40 million metric tons per year, which is about 10 percent of the annual greenhouse gas emissions in California. Although, the ma majority of the CCS projects inject into enhanced oiled recovery fields, 5 current projects inject into deep saline reservoirs.

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AIR RESOURCES ENGINEER LI: CCS projects are currently allowed and are regulated primarily by the U.S. EPA under regulations to protect underground drinking water, as well as greenhouse gas reporting regulations. These regulations require rigorous well integrity and monitoring of injection projects. The drinking water regulations serve as a proxy for climate protection under U.S. EPA's regulations.

The logic is that if CO2 does not leak into subsurface aquifers, it will also not leak to the atmosphere. Our quantification methodology will focus on California's climate programs and climate benefits, rather than clean water protection.

Main barriers for wide deployment of CCS include long-term liability, pore space ownership, landowner considerations, costs and the financing.

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AIR RESOURCES ENGINEER LI: Several State and federal agencies have oversight or interest in CCS. We have coordinated with all of these agencies, since they each of an important role to play. The U.S. Department of Energy is focused on CCS research, development, and demonstration in the U.S. U.S. EPA has established regulations for CCS, including the underground injection control and the greenhouse gas reporting programs.

In California, the Division of Oil and Gas and Geothermal Resources, or DOGGR, has primary authority for permitting Class II wells under the U.S. EPA Underground Injection Control Program. Class II well permitting regulates injection wells in oil and gas operations, including enhanced oil recovery.

Given DOGGR's expertise on injection and well related issues, we have representative Alan Walker at the table.

California Geological Survey has expertise in CO2 storage potential and site analysis. California Energy Commission and the California Public Utilities Commission have been tasked with the development and implementation of the emission performance standards for power plant. CCS can potentially play a role in this standard.

Finally, State Water Resources Control Board coordinates with DOGGR on well permitting and water quality issues.

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AIR RESOURCES ENGINEER LI: In addition to working with other agencies, staff has solicited inputs from non-governmental environmental organizations and the environmental justice community. Several environmental organizations are supportive of CCS as long as we include strong standards to ensure permanency of the CO2

reductions. Environmental justice groups have reached consensus, including impacts to landowners and increased local oil production from CO2 enhanced oil recovery projects. We will be considering these concerns as we develop the quantification methodology.

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AIR RESOURCES ENGINEER LI: To put into perspective the potential use of CCS in California, the State has significant amount of subsurface storage space potentially suitable for CCS. The California Geological Survey estimated subsurface reservoirs could sequester at least 30 gigatons of CO2, which is equivalent to 60 years of California's current greenhouse emissions.

CCS could be used either as a stand-alone strategy for climate change mitigation such as in refinery specific measure, or as a method of compiling with our climate programs, such as the LCFS or cap and trade.

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AIR RESOURCES ENGINEER LI: Essentially, any large point of carbon emissions could utilize CCS, including fuel production facilities and the power plants. CO2 capture cost is a primary component of CCS cost, and largely depends on the concentration composition of the CO2 stream. The more concentrated the CO2 stream, the less expensive it is to capture the CO2. If the CO2

stream is mixture of CO2 and water, such as in an ethanol plant or pure CO2 is already a byproduct, such as in gas procession, the cost of CO2 capture is significantly lower.

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AIR RESOURCES ENGINEER LI: We did want to address the Aliso Canyon natural gas leak, and how it is related to CCS. CCS projects are quite different from natural gas storage projects in terms of health and environmental risks, particularly due to differences in CO2 versus methane. However, the need for proper site selection, strong well integrity requirements and rigorous monitoring apply in both cases.

U.S. DOE and the U.S. Department of Transportation released recommendations for underground storage facilities after Aliso Canyon, and several recommendations addressed those points. We will consider those recommendations, as well as others.

In particular, U.S. DOE's National Energy Technology Lab has developed several best practice manuals for CCS, based on existing projects. Following these and other best practice manuals will reduce potential risks.

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AIR RESOURCES ENGINEER LI: Staff has identified storage permanence as a key area of focus, because

ensuring permanence will both maintain CCS climate benefits and minimize its environmental risks. A focus on prevention through proper site selection, site and risk management and regulatory standards will minimize risks.

As mentioned earlier, CCS projects are in operation today, and the CO2 enhanced oil recovery projects have been in operation for decades with no CO2 leaks have been recorded to date. Staff have and will continue to solicit input from experts and concerned stakeholders.

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AIR RESOURCES ENGINEER LI: Staff developed design principles to guide our CCS-related activities to ensure a robust methodology with environmental integrity. First, and foremost, we must develop a program that projects public health and the environment. We need robust greenhouse gas monitoring reporting, and verification that ensure reductions are real, permanent, quantifiable and enforceable.

As mentioned previously, we are focused on leak prevention and incorporating best practice for key factors that can minimize leak risks. CCS technologies span multiple scientific fields, so it is important to base our program on sound science, and to include other agencies in the development process.

Additionally, staff is committed to developing a robust program through a transparent public process. Lastly, our goal is for the CCS program to serve as a model for other jurisdictions.

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AIR RESOURCES ENGINEER LI: This slide reiterates the U.S. EPA process for CCS permitting and shows that ARB standards would build on those requirements. A CCS project can occur today. In the U.S., a project would need to first apply for and be granted a permit under the underground injection control regulations. In California, enhanced oil recovery projects are regulated by DOGGR. Whereas, saline injection projects are regulated by the U.S. EPA.

The process we're outlining today addresses the strict requirements of California's climate programs. ARB standards will be developed with expert input and build upon existing requirements. After development, we will be bringing the quantification methodology and other documents back before the Board.

I will describe those document -- products more on the next slide.

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AIR RESOURCES ENGINEER LI: The main product we have discussed is the CCS quantification methodology,

which would quantify the climate benefits of CCS projects. In addition to the quantification methodology, moving forward, we plan to develop a permanency protocol, which would ensure that any climate benefits of CCS projects meet the stringent requirements of our climate programs. Our plan is to integrate this protocol into the ARB climate programs that incorporate CCS. This protocol would be developed through our robust stakeholder process, and brought to the Board as part of rule-making amendments.

AIR RESOURCES ENGINEER LI: This slide shows the timeline for the quantification methodology and the protocol development. First, we would develop a concept paper describing our proposed plan at high level. We plan to release that document in the first quarter of 2017 with a subsequent work shop. We then develop a draft quantification methodology and the protocol by the second or third quarter of 2017, and hold additional workshops for these documents.

We plan to finalize the quantification methodology and the protocol by the end of 2017, and bring those items to the Board in early 2018.

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AIR RESOURCES ENGINEER LI: As mentioned earlier, CCS is a critical element of reaching our 2050 climate

goals. As we move towards our 2030 goals, we must not lose site of our 2050 goals. As such, ARB is engaged in long-term CCS activities, which include:

Exploring targeted mid-term adoption strategies to enable widespread long-term adoption; exploring enabling carbon negative technologies; investigating potential CCS direct measures, and considering incorporation of CO2 utilization into the quantification methodology and the protocol.

This concludes our presentation. We'll be happy to answer any questions you may have.

CHAIR NICHOLS: We do have 7 witnesses who've signed up to speak on this, so why don't we hear from them and then proceed to Board discussion.

So we have a list up there on the board. So if you -- you know where you are, come on down.

MR. GRAVELY: Okay. Sorry. Good afternoon, Chair Nichols and Board members. I'm Mike Gravely, from the California Energy Commission, Research and Development Division. I'm just here to support the efforts that have been completed to date and the continuation of these efforts. We had about a 10-year efforts with the Department of Energy called the West Coast Carbon Regional Sequestration Partnership, of which ARB was actively involved with us in that. And we did several projects

under there.

The research basically clearly indicates the need for this quantification methodology in this protocol. It is not a commercial product yet, but we continue to do research and focus in that area. So I think we would support, again, the continued effort and the development of and the publishing of this.

I think one of the key steps to the commercialization of this technology would be to have this methodology, because it takes away some of the uncertain questions of how it will be used in the future.

And again, so we do anticipate continuing to support the effort. And we're just hoping -- happy that you're doing this. And I think it is valuable for the community and the industry and the whole.

Thank you.

CHAIR NICHOLS: Great Thank you.

MS. NAGABHUSHAN: Good afternoon. Madam Chair and members of the Board. My name is Deepika Nagabhushan. I'm the California representative of the Clean Air Task Force. Most of my comments are going to echo the presentation that was given, and all the comments that have previously been made.

Clean Air Task Force has appreciated very much the opportunity to provide input to the ARB during the

many technical workshops that were held over the year in advance of this workshop -- this meeting.

I'm here with my colleague, Bruce Hill, who has presented at the workshop as well. Clean Air Task Force believes carbon capture and storage is a necessary technology for de-carbonating -- de-carbonization of the power sector. And apart from that the industrial sector has only CCS as an option to cut emissions.

CCS consists of carbon capture, transport, and storage technologies that have been in use for nearly half a century. And through CCS, CO2 is safely stored in deep geologic formations many feet underground, where there's thousands of feet of impermeable strata above it.

California is establishing this model of -- this model standard which is -- with which a CO2 injector for permanent storage can be securely stored, monitored, and accounted for, for the purposes of emission reduction. And this is an important process, because it will likely reach well beyond California boundaries.

And CATF believes that to help demonstrate a quantifiable, permanent carbon emission reduction a foundation of rigorous but smart and achievable rules must be set.

CATF believes that QM must include in-depth site investigation and site selection process that requires the

selection of only the most robust, secure, and low risk sites avoiding adverse local community impacts.

The site selection process must also require demonstration of the presence of redundant ceiling layers overlying the storage reservoir. And it should also require proven integrity of legacy wells in the reservoir.

QM should be accompanied by site-specific, risk-based monitoring requirements that are informed by the site investigation process. QM should also recognize the differing needs of CO2 storage in saline brines and through enhanced oil recovery and depleted oil fields.

Thank you.

CHAIR NICHOLS: Thank you.

MR. DIMMIG: Hello. My name is Walker Dimmig. I manage government affairs, environmental affairs, and regulatory affairs for a company called NET Power.

I'd like to thank the Air Resource[sic] Board for allowing me to comment today. NET Power is a collaboration between several large companies within the power sector, Exelon, a large Chicago-based utility, Chicago Bridge & Iron, a global engineering and construction firm, 8 Rivers Capital, a technology development firm, and Toshiba corporation, one of the largest turbine developers in the world.

NET Power has developed a novel means of carbon

capture from natural gas. The technology is not like the other CCS technologies with which members of the board might be familiar, not like the technologies that have been in the public eye more recently.

It uses a new power cycle that relies on a super critical CO2 working fluid instead of steam. It uses oxy combustion. And the result is the enables inherent low-cost carbon capture.

This is also a today technology. NET Power is currently buildings a demonstration plant, a 50 megawatt demonstration plant, down in La Porte, Texas. That plant will come on line later in 2017. We also are already currently developing several commercial plants, the first of which we hope to have on line in 2020.

We believe this technology can have a large impact in California. We virtually eliminate all air emissions from a natural gas power plant. We have greater than 97 percent carbon capture, and complete elimination of NOx due to the use of oxy combustion.

These plants do not require water. We don't use steam. Therefore, we don't need makeup water. So if we air cool, they're completely water free and an impact would produces some water.

They provide low cost, flexible, dispatchable power. We believe these plants will be able to compete

head to head with emitting combined cycle natural gas power plant.

And because of this, as a result, we think deploying this technology, alongside a suite of other technologies, would enable by far the deepest de-carbonization pathways to be pursued.

We're commenting today, because we believe that California has been a leader in addressing CO2 emissions. We think it's a great opportunity for California to lead on CCS, which is a required technology for us to meet our carbon targets, and we encourage the implementation of methodology and processes that enables projects like this, like ours, to be developed. The topic today is -- is one that is a necessary for element project development in order for us to have plants put on the ground.

Thank you very much.

CHAIR NICHOLS: Thank you.

MR. BROWN: Chair Nichols and Board, and I think my wife and kids would like one of these speaker timers whenever I speak to them --

(Laughter.)

MR. BROWN: -- or go into a Polonius moment.

I'm Jeff Brown. I teach clean energy project development at Stanford. Prior to that, I was a clean energy project developer. And prior to that spent 25

years financing energy and power development projects.

And the ARB is the nation's most influential air regulator. My wife thinks that this is like being a rock star getting to talk to ARB. She's an environmental lawyer.

(Laughter.)

MR. BROWN: But here's a few brief observations. And there's one that I did not write down in what I provided you, which is you guys have a bit of an accounting duty weighed against an environmental emergency, so QM is important. It's important to account for molecules of CO2. But in projects I look at that are emitting millions of tons of year, for sure, now you know it, it's going to happen.

The question is if you put it underground in a pretty good spot, whether 1 or 2 percent leaks over 100 years, it's an accounting problem, rather than an environmental emergency.

A couple of quick items. Number one, the CO2 capture techniques are really well known. They're well known because they originated in chemical industries, where the CO2 had to be removed because it was in a contaminant, or it was needed in the product. So, for instance, one type of fertilizer, urea, we capture 130 million tons a year. It just gets turned into fertilizer,

so no one talks about it.

Second, CO2 injection underground the U.S. has put approximately 1 billion tons of CO2 underground in the last 40 years, a billion. At the same time, we have 5,000 miles of CO2 pipelines that are already there. So if there were going to be gigantic problems, we would have had some inkling, I think.

CO2 is cost effective. Not to mention new technologies, like those that Mr. Dimmig mentioned over/under project cost of capture is in the 40 to 50 buck range. And the electric compliance pathways identified by CARB staff has tended to be about 200 bucks per ton captured -- and is the yellow warning light -- well -- and one caveat I would like to add, and this is a finance guide type caveat, but there are many rules that are embedded in, say, the LCFS standard, such as you have to inject the CO2 underground in the same place where you caught it. In reality, it is extremely rare that you catch it and inject it in the same place. So some of those practical glitches need to be worked out over time.

I thank you very much.

CHAIR NICHOLS: Thank you, and thank you for submitting your written testimony as well. So we will have that. Thank you.

We have Mr. Bhatija.

MR. BHATIJA: Good afternoon, Madam Chair and members of the Board. My name is Sudarshan Bhatija. And I'm a dual degree student at Stanford University. I study towards an MBA and an MS in environmental resources. I also have a degree in physics from the Indian Institute of Technology in India.

Over the last few months, I've been working with the Steyer Taylor Center at Stanford on carbon capture policy in California. And I've focused my future career on combating climate change, and I'm very excited to have this opportunity to contribute in some way to the State's efforts.

I stand in support, and I'd like to share some observations from my research so far. Through the last few months, I've led an inter-disciplinary team of researchers from law, engineering, and business to analyze the techno-commercial feasibility of retrofitting existing combined cycle natural gas plants with CCS technology.

We learned that firstly the technical feasibility looks good. Carbon capture technology is well understood. And reducing emissions of natural gas plants from 750 pounds per megawatt hour to 75 pounds per megawatt hour can be a great complement to California's RPS initiatives.

Enhanced oil recovery is also very well understood. In fact, the U.S. is a world leader in CO2

enabled enhanced oil recovery. Traditional oil reservoirs, like those in California, are perfect places to put CO2 because they're deep sealed. And now that we've taken the oil out, there' actually room to put something in there.

Secondly, the financial feasibility looks good, provided that there's support from LCFS initiatives provided by the State. Unfortunately, these incentives are limited by the need to, as Jeff was saying, both capture and sequester CO2 at crude oil production facilities, as per rule 95489, titled, "Provisions of Petroleum Based Fuels".

It is very rare for CO2 to be sequestered in the same spot, or even by the same person that captured the CO2. One party owns the pipeline, a second one owns the capture equipment, a third one owns the pipeline, and the fourth one owns the injection site.

So these rules interfere with the normal contracting paradigms to limit efforts to then ultimately limit CO2 emissions, which is our common goal.

So in addition to the quantification methodology being developed, which is a very crucial part of the equation, I hope the Board and the staff can make it more practical for companies to spend money on carbon capture by being rewarded for LCFS credits. Thank you for your

patient hearing and I'd be happy to provide the staff with more details, based on what I've just summarized.

Thank you.

MR. PERIDAS: Chair Nichols, members of the Board. My name is George Peridas. I'm from the Natural Resources Defense Council. Thank you for the opportunity to comment.

I was the lone environmental representative on the State appointed CCS review panel that concluded its work in 2011. We have taken a very close look at CCS at NRDC for the last close to 15 years now. As you can imagine, we approached the issue with some caution and possibly even some skepticism, having spent a good deal of time looking at the nitty-gritty, and the engineering, and the geology. We have become convinced that this can be done and stored permanently, and can be done safely and effectively.

It is not our favorite, if you like, climate mitigation technology, but we believe that it has an important role to play in a broader portfolio of mitigation technologies around the world, and specifically can also help California achieve its climate -- its ambitious climate mitigation goals with greater confidence, possibly lower cost, and open up the door to even deeper emission reductions.

Injecting CO2 underground is not something that be taken lightly. There is already a significant body of regulations that governs how this is done. And the methodology that's -- the Board is now thinking of developing would come to fill in some of these important emission gaps. So yet again, we'd see California as leading the way in this field.

The applicability of this technology to California is not solely on climate. We believe that there are important other co-benefits that can come from these projects, both in the power sector and the industrial sector, in terms of reducing other pollutant emissions from large facilities, such as power plants and refineries.

We stand in support of the -- of staff developing this methodology over the next few months, and we look forward to working with them closely, and we're also thankful for these excellent series workshops that they pulled together during the past year.

Thank you very much.

CHAIR NICHOLS: Thank you. NRDC has been out in front on this issue for a long time, since the very beginning of AB 32, as I recall. So thanks for continuing your involvement.

Okay. Our last speaker Mr. Templeman.

MR. TEMPLEMAN: Hello, everybody.

This is kind of more of a series of questions. We actually did some work for a technology developer about 2 or 3 years ago that was working on some of these technologies for enhanced oil recovery. And one of the struggles that they had was the political acceptability, or maybe just even environmental acceptability of sort of generating extra oil and gas as a result of injecting the CO2.

They eventually went bankrupt. They couldn't get their technology commercialized. But one of my questions, I guess, to the Board was just if there were a technology that was shown and all the methodologies worked, would there really be a very difficult political, you know, hill to climb in order to, you know, essentially increase oil production domestically with this technology? And is that something that's insurmountable or something that, you know, people should be really trying to accommodate?

CHAIR NICHOLS: Well, you're asking a political question, which might have had a different answer before November than it does now. So I think there's a lot of interest in how to make it -- oil and gas production more environmentally acceptable right now. So I would imagine a brighter future for this.

MR. TEMPLEMAN: Well, and I guess the reason,

specifically to California, is a lot of the power plants and refineries are actually pretty close to California oil areas where the CO2 would go. And so I'm specifically thinking about California, if you're looking to, you know, inject this stuff, it can be done.

You know, I'll tell you some of the technologies that we saw were between $25 to $40 a ton. But if they created offsets or had other credits that could actually come, then the technologies actually did pencil out.

And so it's just a question and more of a comment to the Board.

CHAIR NICHOLS: I mean, it's a perfectly valid question. I don't think we have an answer for it at the moment. What we're engaged in is trying to remove one of the obstacles as we've been asked to do. So we'll carry out that task, and hopefully others that are part of this will contribute to the decision about what happens next. But there's been a long history of, you know, advocacy on one side or the other and nothing actually happening, so --

MR. TEMPLEMAN: Correct.

CHAIR NICHOLS: -- I think the idea is that this process will at least allow for a better consideration of what's possible.

MR. TEMPLEMAN: Perfect. Well, thank you for

your time.

CHAIR NICHOLS: You're identifying the correction questions.

MR. TEMPLEMAN: Yeah, thank you.

CHAIR NICHOLS: Thanks.

All right. That concludes the testimony. Is there anybody who wishes to add any thoughts?

Yes.

BOARD MEMBER SPERLING: I am delighted to have seen this presentation. What surprises me is I thought we were committed to this a long time ago.

(Laughter.)

BOARD MEMBER SPERLING: And actually, that disappoints me, that part of it. But I thought -- so this is -- as Chair Nichols said, this is absolutely an essential part of our set of strategies moving forward. The 21st century is there's going to be a lot of fossil energy. And if we don't capture some of that CO2 and keep it from going in the atmosphere, then that's going to be bad news for the planet.

So this is a 21st century strategy. It's not a permanent strategy, and so we need to really get to it. And there was a comment that it's not commercial, and that's just not true. It's been commercial in terms -- for use in enhanced oil recovery for decades. It's -- and

it's commercial in places where there's a price on carbon. So that's our challenge here.

So the point about quantification, that's -- that is essential, but we need to be moving much faster than that. I -- I mean, we should be building this into our Cap-and-Trade Program, our LCFS. In fact -- so one question is with LCFS, I thought we had incorporated, and then what Dr. Brown said about this problem of it has to be -- you only get credit if it's injected in the same place it was captured. Is that what we did with the last round of LCFS changes?

INDUSTRIAL STRATEGIES DIVISION CHIEF VERGARA: Yeah.

BOARD MEMBER SPERLING: So how do we change it?

INDUSTRIAL STRATEGIES DIVISION CHIEF VERGARA: Dr. Sperling, this is Floyd Vergara. The provision that was referred to in the Low Carbon Fuel Standard is the innovative crude provision. The intent there was to foster innovative techniques in extracting and producing crude oil. Certainly, the comment has merit, and we will be taking a look at that as part of the process in looking at, you know, the regulatory programs that we have, where CCS can play a role. So that would definitely be part of our review of the regulatory measures.

BOARD MEMBER SPERLING: So this is a case where we need to read the small print. I did not -- because I was very supportive of it at the time, and I didn't realize that was the condition on that.

INDUSTRIAL STRATEGIES DIVISION CHIEF VERGARA: I would clarify that, you know, that is allowed in the -- there is a provision in there that allows the CCS, and it's just -- it's -- you know, part of the challenge there is getting a quantification methodology, which is what this effort is for.

BOARD MEMBER SPERLING: So I strongly urge that we move forward and make sure the next round of changes that are made with LCFS and cap and trade incorporate a method for giving credit for CCS.

INDUSTRIAL STRATEGIES DIVISION CHIEF VERGARA: Yes.

DEPUTY EXECUTIVE OFFICER CHANG: So this is Edie. And I just want to say that as we talked about in the presentation, both of those regulations do have provisions that allow CCS to receive either you reduce your emission obligation or it can be credited in the pathway in LCFS.

What we've been missing is if we're going to provide credit for it, how do we quantify that? And so, you know, I understand, you know, there's -- you can put -- you can put CO2 in the ground, and you know that

most of it stays in there. But if we're going to provide credit for it, we want to make sure we know exactly how much is staying down there. So that's what this process is really about.

BOARD MEMBER SPERLING: So how can we say it's part of them, if we don't give credit?

DEPUTY EXECUTIVE OFFICER CHANG: That's -- they -- it provides -- it provides the opportunity, and what we're doing now is the quantification method, but I do hear your plea for urgency, and for us to work on this quickly.

BOARD MEMBER SPERLING: Yeah, because this is hugely important, not just for California. I mean, as we've always said, we're just a small part of the bigger world.

But this sends a very strong signal to industry to be investing in this, to be innovating, to -- and so this is something we should highlight as we go forward.

And I just want to commend actually the staff speaker, the brilliant presentation she did, Dr. Xuping Li. Oh, did I mention she was one of our students?

(Laughter.)

CHAIR NICHOLS: I was waiting.

(Laughter.)

CHAIR NICHOLS: Okay.

BOARD MEMBER SPERLING: Thank you.

CHAIR NICHOLS: Thank you. Yeah, I think this has been a slow and somewhat difficult process to put together. Part of it being simply that we didn't have direction or funding to work on this problem. And there is a lot of swirl, as you've heard, about sort of whose responsibility it is to move it forward. And it became clear after awhile that indeed it was going to be on us.

So I think ARB has risen to the challenge with help from obviously lots of other people as well, but I've attended several conferences myself, where it seemed as though somebody else was going to step up, and, you know, do the work that needed to be done to give us a framework, and it just wasn't happening. So ARB, once again.

BOARD MEMBER SPERLING: Go ARB.

CHAIR NICHOLS: Yeah, exactly.

And with that, other comments?

Sorry, Judy.

Okay. Yes.

BOARD MEMBER BALMES: I'll try to be short, I know it's at the end.

Well, first off, as someone concerned about public health, my responsibility on the Board, I just want to make it clear, as some of the speakers alluded to, that CO2 is not -- if it were to leak from one of these

underground storage facilities would not be causing health problems in and of itself. And it's also much less potent than methane by weight in terms of its climate forcing characteristics, so I'm less concerned about a blowout like a Aliso Canyon at a CO2 storage facility.

That said, I appreciate the Clean Air Task Force presenter's concern about site selection. And what I've learned from my involvement with the Aliso Canyon blowout is actually Southern California gas tried to get approval to update the storage facilities at Aliso Canyon, and they were turned down by the CPUC, because the CPUC's responsibility -- or one of its responsibilities is to protect ratepayers from, you know, extra charges.

And, in fact, there's this -- this concept of gold plating, where, you know, a utility, because they're monopolies, are regulated such that, you know, they get a standard amount of profit -- I think it's 8 percent or something like that -- that they're allowed. And every time that they invest, they get a -- they could actually increase their profit.

So they're -- CPUC is careful about these kinds of investments. And so I just want to throw a note of caution in that we have to work with CPUC on some of these sites, as well as DOGGR, potentially. I mean, I don't know if some of these sites would be -- have been natural

gas storage facilities like Aliso Canyon, but -- that was an example of siloed policy that really kind of alarmed me, because if they had actually guaranteed, or upgraded the integrity of the Aliso Canyon storage sites, we might not have had the big blowout.

So I just wanted to throw that note of caution in.

CHAIR NICHOLS: Well, there certainly are a lot of geological formations in California that have potential in this regard. And the biggest impediment really has been the economics of how to --

BOARD MEMBER BALMES: No, I --

CHAIR NICHOLS: -- how to make it work out.

And the PUC is a part of that. Although, they have been an active Participant in the past in the task force to try to make something happen in California, as has been the Energy Commission, of course. But at the point that I was most actively involved in this, it was the Department of Energy that was really leading the effort and had money to put into it. And the problem that they had was either by regulation or law, I'm not sure which, think could only fund a project if it used coal.

And so the question was were we going to start importing coal into California, so we could have a CCS demonstration project here? That didn't work out well.

(Laughter.)

CHAIR NICHOLS: So back to the drawing board, I guess.

Anyway. On that note, thank you all for bringing us up to speed on what you're doing. And as you've heard, there's quite a lot of interest in seeing you move it forward. So looking forward to that in the new year.

I want to take this opportunity, since there is nobody who signed up for public comment, to adjourn the meeting and to do it with our very best wishes for the staff and for my fellow Board members for a Happy Holiday and a very peaceful and successful new year.

Thank you all.

(Thereupon the Air Resources Board adjourned at 1:31 p.m.)

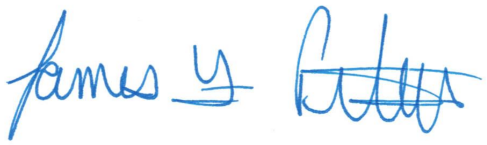
C E R T I F I C A T E OF R E P O R T E R

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 13th day of December, 2016.



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