MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

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APPEARANCES

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Mr. John Eisenhut

Supervisor John Gioia

Ms. Judy Mitchell

Mrs. Barbara Riordan

Supervisor Ron Roberts

Supervisor Phil Serna

Dr. Alexander Sherriffs

Professor Daniel Sperling

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Ms. Edie Chang, Deputy Executive Officer

Mr. Kurt Karperos, Deputy Executive Officer

Ms. Ellen Peter, Chief Counsel

Ms. LaRhonda Bowen, Ombusdman

Mr. Michael Benjamin, Division Chief, MLD

Mr. Jack Kitowski, Assistant Division Chief, ISD

APPEARANCES CONTINUED

STAFF

Mr. Lex Mitchell, Manager, Emerging Technology Section, ISD

Mr. Scott Monday, Air Resources Engineer, MLD

Ms. Katrina Sideco, Air Resources Engineer, Fuels Section, Industrial Strategies Division

Mr. Manisha Singh, Manager, Fuels Section

Mr. Samuel Wade, Branch Chief, Transportation Fuels Branch

ALSO PRESENT

Mr. Mckinly Addy, Adtra

Mr. Jason Barbose, Union of Concerned Scientists

Mr. Will Barrett, American Lung Association in California

Mr. Todd Campbell, Clean Energy

Mr. Tim Carmichael, CNGVC

Ms. Jennifer Case, New Leaf Biofuel

Mr. Harrison Clay, Clean Energy Renewables

Mr. David Cox, Coalition for Renewable Natural Gas

Mr. Thomas Darlington, POET

Mr. Jesse David, Growth Energy

Mr. Dayne Delahoussaye, Neste Oil

Ms. Celia DuBose, California Biodiesel Alliance

Mr. Nick Economides, Chevron

Mr. Evan Edgar, Clean Fleets

APPEARANCES CONTINUED

ALSO PRESENT

Ms. Susan Frank, California Business Alliance for a Green Economy

Mr. Joe Gershen

Ms. Gina Grey, WSPA

Mr. Gary Grimes, Paramount Petroleum

Mr. Jamie Hall, CALSTART

Mr. Miles Heller, Tesoro

Mr. Scott Hedderich, Renewable Energy Group

Mr. Christopher Hessler, AW, Inc.

Ms. Melinda Hicks, Kern Oil & Refining Company

Ms. Bonnie Holmes-Gen, American Lung Association

Ms. Kirsten James, Ceres

Dr. Joseph Kubsh, MECA

Mr. Tom Koehler

Ms. Julia Levin, Bioenergy Association of California

Mr. Jonathan Lewis, Clean Air Task Force

Ms. Jerilyn Lopez Mendoza, So Cal Gas

Mr. Bill Magavern, Coalition for Clean Air

Mr. John McKnight

Mr. Matt Miyasato, South Coast AQMD

Mr. Ralph Moran, BP America

Ms. Lisa Mortenson, Community Fuels

APPEARANCES CONTINUED

ALSO PRESENT

Mr. Colin Murphy, Next Gen Climate America

Mr. Ross Nakasone, Blue Green Alliance

Mr. Shelby Neal, National Biodiesel Board

Mr. Graham Noyes, Low Carbon Fuels Coalition

Mr. Tim O'Connor, Environmental Defense Fund

Mr. John O'Donnell, Glass Point Solar

Mr. Tim Olson, California Energy Commission

Ms. Michelle Passero, TNC

Ms. Katherine Phillips, Sierra Club California

Ms. Leticia Phillips, Unica-Brazilian Sugarcane Industry Association

Mr. Matthew Plummer, PG&E

Mr. Harry Simpson, Crimson Renewable Energy, LP

Ms. Mary Solecki, E2

Mr. Tim Taylor, Sacramento Metropolitan AQMD

Mr. Russell Teall, Biodico Sustainable Biorefineries

Ms. Eileen Tutt, California Electric Transportation Coalition

Mr. Stefan Unnasch, Life Cycle Associates

Mr. Chuck White, Waste Management

Mr. Curtis Wright, IWP

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PROCEEDINGS

CHAIRPERSON NICHOLS: Good morning, everybody. The February 19th, 2015, public meeting of the Air Resources Board will come to order. We will begin with the Pledge of Allegiance. And Mrs. Riordan is going to lead us in that.

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

CHAIRPERSON NICHOLS: Thank you.

Madam Clerk, would you please call the roll?

BOARD CLERK JENSEN: Dr. Balmes?

BOARD MEMBER BALMES: Yes. Here.

BOARD CLERK JENSEN: Ms. Berg?

BOARD MEMBER BERG: Here.

BOARD CLERK JENSEN: Mr. De La Torre?

BOARD MEMBER DE LA TORRE: Here.

BOARD CLERK JENSEN: Mr. Eisenhut.

BOARD MEMBER EISENHUT: Here.

BOARD CLERK JENSEN: Supervisor Gioia?

BOARD MEMBER GIOIA: Here.

BOARD CLERK JENSEN: Ms. Mitchell?

BOARD MEMBER MITCHELL: Here.

BOARD CLERK JENSEN: Mrs. Riordan?

BOARD MEMBER RIORDAN: Here.

BOARD CLERK JENSEN: Supervisor Roberts?

BOARD MEMBER ROBERTS: Here.
BOARD CLERK JENSEN: Supervisor Serna?
BOARD MEMBER SERNA: Here.
BOARD CLERK JENSEN: Dr. Sherriffs?
BOARD MEMBER SHERRIFFS: Yes.
BOARD CLERK JENSEN: Professer Sperling?
Chairman Nichols?
CHAIRPERSON NICHOLS: Here.
BOARD CLERK JENSEN: Madam Chairman, we have a quorum.
CHAIRPERSON NICHOLS: Thank you. Very nice to have you all here.
I have a few announcements, which I want to relate before we begin. A reminder in case there is anyone who is new to these proceedings that if you want to testify, we appreciate it if you fill out a request to speak card. These are available in the lobby outside or with the clerk. We appreciate it if you turn it into the Board Clerk over here before we actually begin the discussion of that particular item.
Also, we will be imposing a three-minute time limit on all speakers. We appreciate it if you summarize any written testimony that you've already submitted or are going to be submitting because we can read a lot faster than you can talk. So it helps us if we have the written

testimony, but then if you just summarize it in your own words.

Also, I want to point out the exits in this room. There are two at the rear and two on either side of the dais here. If there is a fire alarm, we are required to evacuate the room immediately and go down the stairs and exit the building until we hear the all-clear signal that allows us to come back to the hearing room. And that actually has happened in my time here. So I can appreciate it if everybody will follow that instruction.

And with that, we'll begin this morning with one consent item. I understand no one has signed up to testify on it. This is a minor revision to the South Coast 2012 PM2.5 State Implementation Plan. So unless there is anyone on the Board who wishes to take the item off consent, I would appreciate a motion to approve.

BOARD MEMBER MITCHELL: I move approval.

BOARD MEMBER RIORDAN: Second.

CHAIRPERSON NICHOLS: Very good. All in favor please say aye.

(Unanimouse aye vote)

(Board Member Sperling not present at vote)

CHAIRPERSON NICHOLS: Any opposition or abstentions? Great.

We'll move on to the public hearing to consider

the adoption of the evaporative emissions control requirements for spark ignition marine watercraft. I'll ask the staff to begin that presentation.

I want to just comment that this is an area where I know staff has been working with industry for a long time on this issue. We still need more reductions in reactive organic gases to achieve our federal health standards for ozone and spark ignition marine watercraft, which includes inboard, outboard, stern drive, and personal watercraft are a major source of reactive organic gases. So the proposal here today is something that will be an important step on one of our most vexing air quality issues, which is ozone.

So with that, Mr. Corey, would you please introduce the item.

EXECUTIVE OFFICER COREY: Yes, thank you, Chairman.

Mobile sources have historically been the largest source of reactive organic gas emissions in California. With the success of our control programs for on-road vehicles, the emissions contribution from less well controlled off-road categories has become relatively more important.

Reducing reactive organic gas emissions from marine watercraft is key to meeting our air quality goals

in ozone non-attainment areas, such as South Coast.

Today, staff will present a regulatory proposal for reducing evaporative emissions from spark ignition marine watercraft configured with engines greater than 30 kilowatts. By setting more stringent evaporative emission than those adopted by U.S. EPA, this regulation is expected to further reduction. This regulatory proposal requires both builders to certify spark ignition marine watercraft to ensure the enforceability of the proposed standards.

Now I'd like to ask Scott Monday to begin the presentation. Scott.

(Thereupon an overhead presentation was presented as follows.)

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

Good morning, Chair Nichols and members of the Board.

Today, I will present the proposed regulation to control evaporative emissions from spark ignition marine watercraft. For purposes of the Board presentation today, we will be using the term "watercraft."

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AIR RESOURCES ENGINEER MONDAY: Today's presentation will cover the watercraft regulatory

background followed by the details of watercraft emission control. And then I will present the regulatory proposal, and finally staff's recommendation.

Staff evaluated innovative technology solutions and also updated the watercraft emissions inventory to quantify the cost effective emission reductions from this category. The proposed regulation is a result of extensive collaboration between ARB and stakeholders and will yield needed emission benefits.

I will now begin presenting the background for the watercraft regulatory proposal.

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AIR RESOURCES ENGINEER MONDAY: The goals of the watercraft regulatory proposal are first to harmonize, where possible, federal watercraft regulation, including elements such as regulatory format, test procedures, and labeling. This will have the benefit of minimizing the regulatory burden on stakeholders.

And second, to obtain additional emission reductions beyond those being achieved with the federal rule in order to meet California's unique air quality needs and State Implementation Plan, or SIP, commitments.

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AIR RESOURCES ENGINEER MONDAY: Evaporative emissions from motor vehicles have been controlled for

more than 40 years. However, evaporative emissions from watercraft were not controlled until U.S. EPA adopted a rule for new watercraft in 2008. The federal regulations were fully implemented by 2012 and are expected to reduce reactive organic gas emissions by more than eight tons a day in 2037.

Now we are proposing the next step to further reduce evaporative emissions starting in model year 2018. ARB's proposal will provide an additional one ton per day above and beyond the U.S. EPA existing rule. As with the federal rule, the proposal we present today will apply to new watercraft only.

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AIR RESOURCES ENGINEER MONDAY: The types of watercraft this proposal would reduce evaporative emission from are gasoline-powered marine watercraft with install fuel tanks. This includes outboard boats, personal watercraft, inboard stern drive and jet drive boats.

As boat sales recover in California, without new controls, evaporative emissions from watercraft will increase.

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AIR RESOURCES ENGINEER MONDAY: Dr. Haagen-Smit identified reactive organic gas emissions as ozone precursors. Together with oxides of nitrogen and

sunlight, they create ground level ozone.

Reactive organic gas emissions also contain toxic components like benzene, which is known as a public health risk.

Watercraft are a source of reactive organic gas emission statewide. Their control is especially important in non-attainment areas, such as the South Coast. The 2007 SIP calendar commits ARB to developing a regulation to reduce reactive organic gas emissions from watercraft. The proposal we are outlining today meets the commitment described in the 2007 SIP.

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AIR RESOURCES ENGINEER MONDAY: In order to determine the best approach for controlling evaporative emissions from watercraft, it is important to understand how the emissions are generated. There are three driving mechanisms of evaporative emissions: Permeation through the fuel tank and fuel lines; venting out of the fuel tank vent; and liquid fuel leakage from the carburetor and connectors.

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AIR RESOURCES ENGINEER MONDAY: The three mechanisms, permeation, venting, and liquid leakage, occur in various magnitudes during three distinct usage modes.

Running loss emissions occurring occur during

engine operation. Hot soak emission are generated immediately after engine operation when the fuel system heats up. And diurnal emissions are generated when the watercraft is stored.

Current federal regulations that were promulgated in 2008 control these evaporative processes. However, more stringent standards are technically feasible.

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AIR RESOURCES ENGINEER MONDAY: I will now discuss the technical basis for controlling watercraft evaporative emissions.

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AIR RESOURCES ENGINEER MONDAY: This chart highlights the need for evaporative emissions control and specifically diurnal emissions control. Diurnal, or storage emissions, make up two-thirds of watercraft evaporative emissions. Diurnal emissions are doubly important because of usage patterns. Watercraft are often used in ozone attainment areas. However, they are predominantly stored in urban non-attainment areas where diurnal emissions contribute to ambient ozone formation.

With this as background, we can start to look at how the proposed regulation was developed.

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AIR RESOURCES ENGINEER MONDAY: Staff conducted

extensive testing and assessment of technology that can be applied to watercraft to determine an appropriate evaporative emission standards. Based on this evaluation, we developed prototype watercraft evaporative emission control systems. The control technology was transferred from on-road vehicles. This technology includes low permeation fuel hoses and fuel tanks, carbon canisters and pressure relief valves, and fuel injection.

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AIR RESOURCES ENGINEER MONDAY: On-road vehicles have used similar control technology for over 20 years to greatly reduce evaporative emissions.

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AIR RESOURCES ENGINEER MONDAY: To evaluate the optimized evaporative emission control, staff conducted extensive emissions testing of a representative sample watercraft in California using a sealed housing for evaporative determination or, shed, as shown in this slide.

Staff identified representative watercraft populations through the Department of Motor Vehicles, or DMV, database and then procured the watercraft from California boat owners. Over 30 watercraft were tested at ARB's facilities in El Monte.

In-use watercraft were tested to develop base

line emission factors, and watercraft were tested with and without emissions control technology. This process provided ARB with a comprehensive understanding of the watercraft evaporative emissions and their sources.

Once the testing was complete, the watercraft were either transferred to other state agencies or sold. The difference between the shed results from watercraft with and without evaporative emission controls demonstrates the overall emission benefits.

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AIR RESOURCES ENGINEER MONDAY: A number of factors, such as the decline of watercraft sales during the economic recession, compelled staff to re-evaluate and update the emissions inventory. The improved emissions inventory developed by staff incorporates new evaporative emission factors measured using the shed method described in the previous slide and watercraft usage and storage patterns derived from the California State University Sacramento survey.

The updated forecast reflects the recession and future year marine watercraft population and sales, which are based on the most current boater registration data from the DMV, the housing start data provided by the UCLA Anderson School of Business and human population growth provided by the California Department of Finance. The

updated inventory was used to evaluate base line and control emissions.

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AIR RESOURCES ENGINEER MONDAY: This slide shows the actual and projected sales data of outboard marine watercraft in California, which accounts for about 55 percent of total sales. Similar projections were developed for other watercraft categories, including inboard stern drive, personal watercraft, and jet drive.

Historical DMV registration data represented in this slide by the black line shows a large decline during the recession. As a discretionary item, the watercraft sales were hit hard by the recession, especially for small boat builders.

However, the past five years indicate a recovery in watercraft sales due to the improved economy. Our analysis found a strong correlation between US housing starts and outboard watercraft sales.

Our near-term forecast shown here by the dashed red line to 2019 assumes this relationship continues during the economic recovery. Our long-term forecast, shown by the solid green line, begins in 2020 and assumes new watercraft sales grow at the same 1.2 percent rate as the human population in California.

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AIR RESOURCES ENGINEER MONDAY: The projections made in the inventory are further supported by the June 2014 publication of the UCLA Anderson forecast, which shows a strong rebound in housing starts both nationally and in California. As the proposed regulation is implemented in model year 2018, emission benefits will be generated through sales of new watercraft that comply with the more proposed stringent evaporative standards.

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AIR RESOURCES ENGINEER MONDAY: Implementing this proposal would reduce reactive organic gas emissions from watercraft. However, the emission benefits will not be fully realized for almost 20 years due to the long ownership periods.

On average, boat owners keep their watercraft for about 30 years, with some keeping a boat for 50 to 60 years. Since watercraft has a longer lifetime, emission benefits will phase in gradually over time, which is expected to be proportional to new watercraft sales.

Therefore, it is particularly important to start controlling evaporative emission from this category now. This proposal pays off in the long term by reducing reactive organic gas emission by about one ton per day in 2037 time frame and beyond. Reduced benzene exposure is also an important co-benefit of this proposal.

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AIR RESOURCES ENGINEER MONDAY: I will now present details of the regulatory proposal, including the implementation schedule, control technology, and cost effectiveness.

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AIR RESOURCES ENGINEER MONDAY: Here is an overview of the standards implementation dates and applicable categories. Most watercraft can be divided into smaller watercraft with portable marine tanks and larger watercraft with install tanks, where the dividing line between the two is about 30 kilowatts, which is equivalent.

For most watercraft with engines less than or equal to 20 the Board adopted a regulation and harmonize awarded the U.S. EPA. Staff determined that it was not cost effective to seek further reduction from the smaller engine category because it would require significant engine design and retooling.

For watercraft with engines greater than 30 kilowatts more stringent standard for fuel hose fuel tank venting control and fuel injection begin in model year 2018. Upon commercial availability, a more stringent fuel hose requirement will be implemented in model year 2020.

These standards are more stringent than the

current U.S. EPA evaporative standards and provide a cost effective way to reduce reactive organic gas emissions. So to better illustrate --

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AIR RESOURCES ENGINEER MONDAY: -- what control technology the ARB standards will require, this slide shows the anticipated components that will be likely used for the proposed regulation. Staff anticipates that to meet the proposed new standards, manufacturers would use low permeation fuel tanks, carbon canister, or pressure relief valve, lower permeation fuel hose, and fuel injection or low evaporative emission carburetors. We estimate the total cost of regulatory control will be about $50 for an average boat price of 30,000, which is less than two-tenths of a percent of the total cost. We believe that manufacturers are migrating to fuel injection with new watercraft to meet consumer preferences and needs. And therefore staff does not see this as a cost associated with the proposed regulation.

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AIR RESOURCES ENGINEER MONDAY: Carbon canisters are expected to be the primary vented emissions control technology used to comply with stringent diurnal standards. However, pressure relief valves may be used for diurnal control as well. The proposed test procedures

require that the evaporative emission control system be designed to withstand exposures consistent with typical operation in California.

The ultimate goal of this regulation is to control evaporative emissions over the entire life of the watercraft. Durability performance criteria are required for all new watercraft to ensure that the added cost of control technology results in real-world emission reductions.

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AIR RESOURCES ENGINEER MONDAY: This regulatory proposal has been carefully developed to be cost effective by maximizing emission reductions while avoiding unnecessary costs. It is not expected to limit the types of watercraft available in California. The cost effectiveness was calculated using industry reported costs and accounts for industry markup. The cost of this regulation is balanced by the benefits of the proposal.

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AIR RESOURCES ENGINEER MONDAY: In this final segment, I would like to present the staff recommendation for the regulatory proposal.

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AIR RESOURCES ENGINEER MONDAY: The proposed regulation was collaboratively developed with the

stakeholders beginning in 2006. Five public workshops and over 40 stakeholders meetings were held. We included manufacturers of watercraft in these discussions as they had extensive experience complying with similar emission standards.

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AIR RESOURCES ENGINEER MONDAY: During the regulatory process, staff worked with stakeholders to develop the most cost effective proposal. Industry provided valuable input and suggestions for improving the regulatory proposal.

As a result, staff was able to mitigate concerns without compromising the integrity of the proposal, including harmonizing test procedures to reduce cost to manufacturers, delaying implementation during economic recession, and reducing the scope of the proposal.

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AIR RESOURCES ENGINEER MONDAY: We have become aware that the regulation needs a few minor modifications. To accommodate industry's comments and suggestions, we are proposing a 15-day change that will modify the regulation and test procedures to improve clarity for manufacturers. These changes include clarifying the requirements to certify pressure relief valves and clarifying design specifications for fuel fill deck plates.

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AIR RESOURCES ENGINEER MONDAY: In summary, controlling evaporative emissions from watercraft will provide emission reductions that are critical for ARB to meets its air quality goal. ARB has tested prototype evaporative systems on watercraft that demonstrate the proposed standards are feasible with available control technology. The proposal was developed with extensive stakeholder participation and is cost effective relative to comparable evaporative emission regulations adopted by the Board.

The proposal will improve public health by reducing ambient ozone concentrations and exposure to benzene.

Staff recommends that the Board adopt the proposed regulation with the 15 day changes.

This completes the watercraft presentation. I'll be happy to answer any questions you may have.

CHAIRPERSON NICHOLS: Thank you. Why don't we go to testimony. We have two witnesses who have signed up on this one. The first is Dr. Joseph Kubsh and the second is John McKnight. So we will listen to you.

Hi. Good morning.

Dr. KUBSH: Good morning, Madam Chair and members of the Board.

My name is Joe Kubsh. I'm the Executive Director of the Manufacturers Emissions Controls Association. Our association includes many of the major manufacturers of both exhaust and evaporative emission controls for mobile sources, and I'm here today to indicate my industry's strong support for the staff proposal.

MECA agrees with the staff assessment that proven cost effective evaporative emission control technology derived from the automotive sector can be implemented on spark ignited marine engines to comply with the staff proposal.

In our written comments, we highlight these available evaporative emission control technologies, and we also provide some suggested modifications to some of the test procedures aimed at making these regulations more easily implementable.

I'd like to thank the staff for their efforts in bringing this proposal forward, and I would ask the Board to adopt the proposal as presented to you this morning. I would be happy to answer any questions. Thank you.

CHAIRPERSON NICHOLS: Thank you. I don't see any questions.

MR. MCKNIGHT: Good morning, Madam Chair and members of the Air Resources Board. I'm John McKnight. I'm with National Marine Manufacturers Association, and we

represent the boat builders in the United States and here in California. Want to thank you for the opportunity to testify here today.

NMMA did write a letter supporting the rule. That's pretty much for the record. I do want to say while I have a chance here at the podium to tell you the history of what hapened here. We started working with CARB and EPA in 2001. We put a boat in the shed like Scott showed. We got our own boat, because we wanted to make sure what they were doing was the right thing and we started working on this. We were moving pretty quickly on the rule. Things were looking good.

Around 2007-2008, we had a thing called the recession. And what happened here in California was absolutely devastating. I mean, sales nationwide for boats were down 80 percent. Here in California, we had some engine manufacturers who sold less than 100 engines in that year. I mean, dealers were closing. Fifty percent of the dealers in California had closed. And your two trade associations out here, Southern California Marine Association and the Northern California Marine association went bankrupt, closed their doors. And since that time, NMMA has come in and helped bring those associations back to life.

What does that mean like in the sense of business

out here? Well, you have a San Diego Boat Show. That closed. The L.A. Boat Show, that closed. You had the Long Beach Boat Show and the San Francisco Boat Show. All those boat shows closed out here. The association has stepped in and they are back and running. The L.A. Boat Show opened yesterday.

And our association is bullish on California. We figure 38 million people have to start having fun out here.

Anyway, on the flip side, I'm on the business side. Look on the flip side. The ARB, I kind of had to be sympathetic to them because we were the last unregulated category for emissions as far as evap emissions. We would be happy to stay that way, but we know it's not going to happen with these guys.

So anyway, we also know that we are a significant source of emissions. You know, you take a fuel tank on a boat, 40 gallons is small. We had fuel tanks on boats 250 gallons. That's a lot of gasoline ends up in your air. Creates pollution. So we knew we had to be regulated, and we also knew that the technology exists, because like I said, we threw a boat in the shed in 2001, start taking a look at it.

So, you know, there's been a lot going on here. Like I say, we now are running the boat shows out in

California. We're supporting. We're bringing jobs back to California. We are part of the California business community out here.

And staff understood that. That's the first thing I went in to talk to Dr. Ayala and said, "We want to make it happen for you. You have to help us make it happen for us." There was -- staff worked with us on a lot of flexibility on the rule. Much more flexibility than I've ever seen on other rules. I've been doing this for a quarter of a century.

And also, we have a novel approach. I think it's a better approach for us and them.

I want to thank you. Thank all the staff here. And also I would like to ask one thing of the Board, and that is in closing to just kind of direct the staff to work with us between now and 2008 as we implement this rule to help us with training and education. I got about 3,000 boat builders worldwide. I want to make sure they know what they have to do to sell into California.

CHAIRPERSON NICHOLS: Where are you based? Where's your office?

MR. MC KNIGHT: Our main office is in Washington, D.C. We have a California office in Riverside to run the boat shows.

CHAIRPERSON NICHOLS: So you'll come back to

California?

MR. MC KNIGHT: I love coming out here. Invite me back, I'm your man.

CHAIRPERSON NICHOLS: Good. That's excellent. That helps our tourism, helps our economy.

MR. MC KNIGHT: Thank you very much.

CHAIRPERSON NICHOLS: Thank you.

Well, that is it as far as the list of witnesses is concerned. And I do want to close the record at this point, but we can open it up for Board discussion. And I see at the far end, Dr. Sherriffs.

BOARD MEMBER SHERRIFFS: Thank you. Thanks for all that enthusiasm.

You know, this is very important in the San Joaquin Valley, because the boats are not only operated in areas of ozone challenge, they're stored in areas of ozone challenge. So it's a big issue.

Mostly, we're worrying about NOx, but the reactive organics are very important in that, too. So it's a small very important contribution. So it's great that we're finally addressing it, and it's great that the industry is on board and enthusiastic.

One question. You know, it actually took us a long time to get here. And 2018 is a long way away. And I'm wondering is there any way to move this up a little

bit. The technology is there. It's not a fancy technology. And it would appear to be pretty easy to apply, as long as people understand. It's not a terribly expensive -- not a big proportion of the overall cost of these things. That's one question.

The other, what are we doing to be sure that when the people are fixing their old boats that, in fact, they're using better equipment? If they have to replace a gas tank or go down and get a new hose for my gas line, I hope we're thinking about, if we haven't already, ensured that we're selling the best stuff out there to help clean the air and improve our health.

CHAIRPERSON NICHOLS: Good questions.

Mr. Monday, do you want to answer?

MLD DIVISION CHIEF BENJAMIN: This is Michael Benjamin, Chief of the Monitoring and Lab Division.

In the first question regarding potentially moving up the implementation date, you're correct that technically it would be possible. But I think the challenge here -- and this is highlighted by the testimony that we heard from NMMA and Mr. McKnight, is that implementation in the phase-in of this is going to be critical so that we don't hurt the boat builders in California.

And so there is still some issues that we need to

work through on the labeling side, on the certification side. And those details, even though 2018 may sound like it's not very far away, it's going to take us a couple years to finalize and work through some of those issues with industry and also do the outreach that Mr. McKnight referred to.

So I think what we want to do is to have a regulation that will get the emission reductions that we need as soon as possible, but do it in a meaningful way with stakeholder buy-in and with appropriate outreach. So the time line that we developed really tried to take all of that into account. So that's the response to the first question.

On the second one regarding replacement of parts, you're correct that as parts wear out -- and on boats, typically fuel tanks don't wear out very quickly. They have a lifetime that oftentimes is the life of the boat or maybe even at a minimum 20 or 30 years. Those don't tend to get replaced on existing boats. What tends to get replaced are the hoses. The hoses that are available right now comply with the low permeation standards established by U.S. EPA. And what would be available in the market as this rule gets ruled out would be CARB certified components.

So we fully anticipate that existing boat owners

will be using the lower -- the new lower permeation of hoses that are available.

One of the challenges that we had will be though addressing things like Internet sales and boat owners purchasing potentially non-compliant replacement parts that don't meet our standard. So that's going to be a challenge we'll have.

CHAIRPERSON NICHOLS: Given the cooperation that we seem to have established with the industry, hopefully we can get them to help us get the word out through these to the owners about the boats and about the benefits of going with the better ARB certified equipment.

MLD DIVISION CHIEF BENJAMIN: I agree absolutely. I think one of the things we've achieved through this rulemaking process is having a very collaborative relationship with NMMA and other boat builders and associations. And I think that that relationship will enable us to really role this out in a way where we get maximum benefits, both from new boats and potentially additional emission reduction opportunities from existing boats.

CHAIRPERSON NICHOLS: Okay. Any other questions or comments before we go to a Resolution?

If not, I think Mr. Roberts is ready. Supervisor.

BOARD MEMBER ROBERTS: Thank you.

I would guess, although I'm not certain, we have a disproportionately high number of boats in San Diego. So I'm enthusiastic about this. I have to observe I don't -- given the last speaker, I don't think I've ever seen anybody happier as we lead them to the gallows here. We appreciate that kind of cooperation, and I'll move the Resolution.

BOARD MEMBER RIORDAN: I'll second.

BOARD MEMBER BALMES: Second.

CHAIRPERSON NICHOLS: In that case, I'll call for a vote. All in favor please say aye.

(Unanimous aye vote)

(Board Member Sperling not present for vote)

CHAIRPERSON NICHOLS: Any opposed?

Any abstentions? All right. Thank you all very much.

The next item is an informational item on some significant findings from recent climate change assessments, both national and international. And I think it's a good opportunity for the Board to be updated on some of the most important recent findings as we strive to make decisions that are based on the best possible science.

We've invited one of the top experts on climate

change science and communication, Dr. Susan Moser, to speak to us today. And I will ask Mr. Corey to introduce the item.

EXECUTIVE OFFICER COREY: Thank you, Chairman.

Today's presentation will be a brief overview of the headline statements from the recent Intergovernmental Panel on Climate Change, or IPCC report. The presentation will also provide an overview of the national climate assessment, with an emphasis on the finding and implications for California and the west coast.

By way of introduction, Dr. Susan Moser formerly served as research scientist at the National Center for Atmospheric Research in Bolder and a Research Fellow at Harvard Kennedy School of Government and Heinz Center in Washington, D.C. She's now a Social Science Research Fellow at the Woods Institute for Environment at Stanford University and a Research Associate at the University of California Santa Cruz Institute for Marine Science.

Dr. Moser's work focuses on adaptation to climate change, resilience, communication, and decision support. She contributed to the IPCC's fourth and fifth assessment reports. She's also the lead author for the Coastal Chapter of the third U.S. national climate assessment and has been involved in California's climate impacts and vulnerability assessments since 1999.

I'll now ask Dr. Moser to please begin the presentation.

(Thereupon an overhead presentation was presented as follows.)

DR. MOSER: Thank you very much, Chairman Nichols and Board members.

Good morning. It's a great pleasure to be here and have this honor to brief you on the IPCC and the national climate assessment. I want to do that by placing --

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DR. MOSER: -- this briefing in a long history of California climate policy being deeply informed and motivated by the latest findings on the climate science. So let me just give you a very brief overview of that history --

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DR. MOSER: -- and place the IPCC findings in that context.

As you know, the IPCC was formed founded in 1988 and then produced its first assessment in 1990. And about every five, six years, it comes out with another assessment. The most recent one, IPCC AR-5, the assessment report number five, in 2013 and '14. That, of course, has been paralleled. As you are well aware with

assessments done here for California, and that actually goes back also as early as the 1990s, the first-ever assessment led back then by the California Energy Commission, a study by the Union of Concerned Scientists and the Ecological Society of America, often known here in the state as the Green Book, that was very influential in shaping early policy and then it goes on from there.

I mentioned just briefly that as part of the first national climate assessment, which of course is a Congressly mandated process, a first report on California was produced in 2002. For the second assessment, there was no such California assessment, but there was one conducted just more recently in 2014 for the southwest, which includes California.

So I want to put that in the context of the big milestones, if you will. And I, of course, was selective in putting these forward. But you are familiar with them. And they have become successively more stringent are have put in place the implementation of these ambitions. And of course, after IPCC, the most recent report came out and the national climate assessment, Governor Brown in his inauguration state of the state was very ambitious and that's been followed now by legislation. So we're -- this is the sort of history that I want to lay out in terms of how much it's been motivated.

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DR. MOSER: Let me begin in a brief retrospective by thinking back to the 1990s when the IPCC first talked about climate change. The headlines back in the 1990s -- I don't know if you recall this -- was basically, yep, I think something is going on. We think we're seeing something, but we're not quite sure.

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DR. MOSER: That and the second assessment in 1995 was really strengthened and the headlines back then in the news media was really about a discernable human influence. That was not there in the first assessment. At that point, we thought maybe we could see that humans are having something to do with the kinds of changes that were observed.

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DR. MOSER: And at that point, the IPCC established sort of a nomenclature for its level of confidence about the scientific findings. I want to put them out here for you to review. To the extent it was possible, you know, just to assign confidence levels which are based on the laws of physics and the extent of the evidence, the theories and the model projections ranging from very low to very high. And where we could, we attached actually probabilistic likelihoods, which it's

always important to put numbers with those names because it's actually known that the public when you say likely understand, it can mean anything from one percent chance to 99 percent chance.

So in the IPCC nomenclature, likely means at least a chance of two-thirds or very likely at least a nine out of ten chance of actually being true.

And to the extent we are really certain, we use the terms unequivocal. So you'll find these words here in a minute.

But in the third assessment, those terms were not yet fully applied. When the IPCC came out, the big headlines back then were not just we can now demonstrate show the earth's climate has changed, but we had so many different pieces of evidence that we could say there is a collective picture of a warming world. That was really at that point what we could say. And just think back, you know, this is about the time when the Pavely bill was being written.

So then the second most important finding at that time was that most of the warming observed, just the warming, was attributable to human activity. So that much we could say about 12, 13 years ago.

By the time of the fourth assessment, there was really a sea change in the amount of evidence available,

the quality of the models available, so much so that the IPCC concluded warming is unequivocal. That's the top level of certainty that scientists are happy to express. They said that at that point they attached a probabilistic likelihood to the fact that the observed increases in temperature are very likely, that is, more than 90 percent chance due to the increases in human emissions, and a greater than 66 percent chance that there is also a discernable influence on the impacted systems, the physical systems like the water resources, the biological systems, ecosystems, and so forth both on land and in the ocean.

Now it's important here to just point out that there is a lower likelihood because, of course, the temperature changes in rainfall, they all need to translate into the impacts on the physical or natural systems. So that is at least where we could now see an influence.

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DR. MOSER: And now we come to the fifth assessment, what is -- is there anything more to say, if you will.

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DR. MOSER: Well, it is very significant I think what the IPCC is now willing to say. One is that the

human influence on the climate system, the entire climate system, is clear and greenhouse gases are the highest in history. And we see now widespread impact on human and natural systems. That is yet another layer further down in the chain of impacts now of widespread impacts on human and natural systems. The warming is unequivocal. And many of the observed changes are unprecedented over a decades to millennium. That's important, and I'll come back to that in a moment here.

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DR. MOSER: This is what it looks like. You see the temperature curve. You've probably seen these many, many times. And of course, you know, it was in the news that even after the IPCC was released that 2014 is the warmest year since temperature referenced with thermometers have begun, 38th consecutive year the warming average is -- the global average is above average. Nine out of the ten warmest years all have occurred since 2000. So you know, it's just -- I think this is becoming no more news, you know. It's like on an exponential curve. Every next year is going to be higher than the last. So I think this is something you must get used to.

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DR. MOSER: This is what it looks like when you spread it out over geographically. And what I want to

point out here, very important point, is that the land areas warm faster than the oceans. Of course, that means when I give you global temperature projections, that you should add a few degrees for the land areas, which is where we all live.

And you know, the right-hand graphic here shows that it's quite a significant amount warmer on land than it is over the ocean areas.

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DR. MOSER: As I said, this set of indicators that we now use, it is that collective picture of the warming world, the glaciers are going down on land over the sea ice as well as the big ice sheets, temperature records in every arena. And of course, then we see it in the natural systems, the spring is coming sooner. Species are migrating cold-ward or upward in altitude.

I always like to point out that they're not republican or democratic. They don't have an agenda. They simply go where they're most comfortable. So I think it is pretty hard to dispute that some major changes are underway.

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DR. MOSER: Important also to point out that the drivers behind this warming are unprecedented, at unprecedented levels in at least 800,000 years.

And I like to put that in perspective. The human species actually only has been around for 200,000 years of that period. Or if you maybe want to put this even in starker perspective, 10,000 years ago at the end of the last ice age, there were about five million people, members of that homosapien species on the entire planet. That's about the size of L.A. and San Diego combined, spread out over the entire planet. Now we have how many L.A.s and San Diegos on this planet. And that is why these numbers of CO2 methane and nitrous oxide are going up.

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DR. MOSER: Let me show you in these terms here. What you see on the top of this graphic is very clearly since the industrial revolution how the use of fossil fuels -- they also include cement there which emit CO2, has just been growing exponentially. And what you see in the bottom there is that the proportion of emissions from land use changes, such as deforestation, has actually been going down. We are no longer on an upward trend in that. Even though it is in many ways unacceptable for biodiversity reasons and whatnot. But that amount of CO2 increase is relatively smaller compared to those from fossil fuels.

But importantly, at the same time, the natural

sinks that we have, the forests, the oceans that take up our CO2, that capacity is going down. They are basically -- the sewers are filling up, if you will. They shouldn't be considered sewers, but we seem to have done that.

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DR. MOSER: That means that you see the amount of CO2 that is accumulating in the atmosphere is actually growing faster.

So this is a good graphic here. I'll date myself here. I put that little red quote there about half of the cumulative human emissions of CO2 have occurred just in the last 40 years. I'm 48 years old. That's my lifetime. So most of what we've put in the atmosphere we've done over my lifetime.

You see it in every record that we've been tracking, whether it's land use, whether it's population growth, whether it's any of the emissions that you see depicted here. They see the area that is now mainly driven by the human impact on the planet not likely to stop any time soon, given economic and population drivers behind that.

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DR. MOSER: Now, as a result of these kind of changes, we are now observing that many, many extreme

weather events are actually increasing over that same time period. That was much harder to say even five years ago because the evidence was simply not in. We hadn't had as many good data. And many of these now also can be linked to human influences. You know, climate change did not invent hurricanes. It did not invent draughts. But we can now say with confidence that many of these events actually have an influence of humans behind it. And you see them listed here, cold extreme are going down, warm extremes increasing, higher sea levels. And the number of days with extreme rain events are increasing, at least in several regions.

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DR. MOSER: That brings up the question is what we're currently seeing here in California, is that due to climate change? There was a study that was actually put forward by NOAA more recently than the IPCC. I just want to put it forward. They did try to model basically with natural or anthropogenic forces, whether this particular draught can be attributed to global warming. And they found it cannot.

So interestingly enough, this type of event falls within the envelope of natural variability. We cannot discern this has been given solely by the human causes. Very important finding. Now what makes it worse, however,

is that we have much higher temperatures.

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DR. MOSER: I'll show you that in a moment what it looks like for California. When you have higher temperatures, of course, the demand for water is much higher. And so we see worsening conditions.

But I think the bigger issue is not just can we attribute any one of these events to human causation. The big issue is the last time we had this kind of a draught in the state, we're about five million people here, in 1927. So at that point, much fewer -- far fewer people wanted that little water we have. Now we have 35 million. So that's the issue that you have the extreme events, plus the growing vulnerability that makes these events much more severe and in terms of impacts for us than otherwise.

Let me very quickly mention a couple of other findings from the latest IPCC before turning into the things that happen here in the state.

For the first time, we actually see the IPCC say something very strong about severe, pervasive, and irreversible impacts. Irreversible impacts is not the word you want to see in an assessment like this. That's the stuff that really should keep you all up at night. Irreversible impacts on people, on ecosystems. Irreversible losses in the species in the systems that

support our economy, our livelihoods.

And of course, the other thing that we have from the IPCC is a very clear assessment. Mind you, they're not policy prescriptive. But they're trying to assess for you basically whether or not we can reach emission reductions, substantial ones. And basically what they're saying is the only way to get below a two degree warming above pre-industrial conditions is if there are substantial and sustained reductions in greenhouse gas emissions, very much like California is considering.

Let me just say, so you're already at the forefront of this. Some other states and nations are beginning to take some efforts.

What the IPCC is saying that without additional efforts -- so if you're thinking you're doing much, yes, you do. But without additional efforts, we're going to see warming on the magnitude of the kind of warming we've seen since the ice ages.

I'm basically pulling this together, five degrees of warming since the last ice age to pre-industrial conditions. Well, another three and a half to four or five almost over just 100 years, if that's the median range here. We say that with high confidence. So something that should keep you up at night.

Mitigation scenarios that have a greater than 66

percent chance of staying below that two degree guardrail, if you will, need to end up with no more than 450 parts per million concentrations of CO2 in the atmosphere. You see the past way they describe here, 40 to 70 percent below greenhouse gas emission reductions by the middle of the century and near zero or below -- in other words taking CO2 back out of the atmosphere -- by 2100 to get to that. That's just a 66 percent chance. But you know, that would be really great if we would get there.

I don't want to spend a lot of time on this particular question or set of projections that they put forward that these represent the emissions pathways that are associated with these different temperature projections I just put forward.

The point I simply want to make, if we want to get to that two degree chance of achieving two degrees of warming, most of the curves bend very significantly downward by 2020. That's tomorrow. You pointed out 2018 is far out. For emission reductions, it's about yesterday. So I think this points to the fact that there is no time to lose if you want to get there.

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DR. MOSER: Of course, we know that these -- many of these environmental changes, for example, sea level rise, will continue for centuries to millennium. We are

putting in place changes that will effect generations to come. And the more we push the system, I guess the bottom line here is that these abrupt and irreversible changes are becoming more likely.

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DR. MOSER: I want to say one thing here about as a result of this, that the longevity of this, it's not like an air pollutant where you cut it and it is gone out of the air. CO2 and other greenhouse gases stay in the atmosphere for decades to centuries. And of course, that commits us to having to deal with the impacts as well as dealing with the emission reductions.

What this graphic here is trying to show is that we sort of have a space, if you will, between the societal stressors we already experience and between the climate stressors and other biophysical stressors that might impinge on us. In that squeeze space between them, we might have a resilient future. And the more we take care of the emissions and lower the risks of severe climate change, the greater that space from the outside, if you will, of the envelope. The more we reduce through adaptation and other measures societal stressors and non-complimental environmental stressors, the more we have, if you will, the breathing space to actually deal with these impacts. It's the combination between

mitigation and adaptation that we both need to have a livable and thriveable situation.

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DR. MOSER: Let me turn very quickly to the third assessment that came out last May. And of course, one of the chapters focuses on the southwest. I want to emphasize that underneath that is the third climate assessment that was done here for the state. That was a big technical input into the larger assessment for the region. And of course, you know that --

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DR. MOSER: -- California is currently working on or beginning to work on its four assessment.

Here, just the key findings from the southwest chapter. None of them will surprise you. You've heard them many times. I think the pictures probably speak much louder than the particular words.

Last year, when we had a bad snow pack, you saw that kind of picture, satellite picture of the sierra. This year, at the same time, it looks like this. Basically no snow in the sierra. This summer will be a very difficult summer for anyone depending on that.

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DR. MOSER: And of course, it is not just our problem. What happens to California, you all know this,

happens to the bread basket, the food basket of the nation and beyond. It is the number one producer of many high-value specialty crops. Of course, that means many people's livelihoods depends on it. It is the water deficiency and the increasing temperatures that make the difference for many --

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DR. MOSER: -- in California.

I want to point out this graphic here produced or based on data from the California climate tracker. It shows basically the temperature increases over the last century in California. And you see here that this past year was exceptionally the warmest ever year, not just in the world, but in California as well, and making the problems with the draught much worse. And this part here is climate driven, even if the draught, per se, we cannot attribute to the problem. It is the combination of those two factors that creates the problems we see and we need to take care of it.

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DR. MOSER: You know, these problems, the less snow pack there is, the higher the temperature, the longer the snow-free season, dry season. We have many more wild fires. We also have a track record that twelve is the largest fires we've ever seen in the state have occurred

since 2000. So there is much that forest managers in this state need to deal with.

And of course, this effects also any efforts that we might want to do to manage our public lands and private forest lands for carbon sequestration. Very important to consider that the impacts are already effecting the very systems that we now want to capture more.

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DR. MOSER: On the coast, these are the pictures. And I guess I should have maybe taken a picture right now driving up from Santa Cruz and showing the king tides currently going on in the delta. You see the water standing everywhere. And this is, if you will, the sunny day inundation. You don't need a big storm anymore to have severe erosion and flooding impacting people's lives in California.

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DR. MOSER: Lastly, the finding here relates to the combination of heat and air pollution. I was very glad to see what you just decided just before my speech here, because ozone basically is a greater risk with higher air temperatures. And you see that this is going to be particularly important for urban areas, but also for people who work outside in our fields. So very important impacts on our public health systems as well as

electricity and water supplies that all depend on functioning energy supplies.

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DR. MOSER: Just very briefly want to point out we're now working on the fourth assessment, which is this time led by the Natural Resources Agency, but the EPIC program from the California Energy Commission will contribute major new studies on impacts on the energy sector. Very important how this has changed over time. You know, originally, we just sort of did these top-down impact studies on different sectors. Now we're looking at multi-sectoral impacts and what happens in the water sector happens and so on, so forth.

We're looking more at extreme events because they cost the most. They cost the most lives. And we try to create much more adaptation related information for policy makers at all levels, which then becomes available through Cal Adapt as many of you know and is widely used in the state by local policy makers.

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DR. MOSER: So I want to close here with that there is -- your efforts and what has just been put forward by the Governor and the Legislature cannot come soon enough. I think it's essential that you succeed as a model for the world. You've seen the sort of ever-growing

urgency in the tone of the IPCC and reflected in the national climate assessment.

So I thank you and really appreciate the opportunity to brief you on this. I'm happy to answer any questions. Thank you.

CHAIRPERSON NICHOLS: Thank you, Dr. Moser.

First of all, thank you for being with us and for your work and contributions as well. As you have pointed out, this Board has been working on this issue for quite a long time. And we're very proud I would say of the role that California has played in this area and everybody who is on this Board has had an opportunity to be a participant in acting on the kind of good information that you have brought us.

We don't have any public witnesses who have signed up today, and I doubt that's an indication of the fact there is nobody in California who is a climate skeptic or who has doubts, either about whether it's real or whether there is anything that can be done.

I think if anything, the situation may have become more polarized in recent years with those who are either denying the existence of a problem or don't think anything can be done about it. Simply going back to their respective barricades and not wanting to deal with the situation at all. Clearly, that's not the view of the

Governor or the leadership of the Legislature. So there is going to continue to be activity in this area.

But those of us who have positions of responsibility also have a role in the community. And we talk to people. And people talk to us. And I think it's important that we be armed with the best information that we have and also with the best wisdom that's out there about how to effectively communicate about the nature of the problem and what's being done about it.

So in addition to your presentation today, I think it would be helpful if the staff could be providing all the members of the Board at a minimum with these California climate assessment documents that are out there as kind of a basis for all of our libraries and presumably they can then access more copies if they need that sort of thing to make available to others.

And I would welcome any thoughts or suggestions from my fellow Board members about additional ways to act on this, starting with you, Mr. Gioia.

BOARD MEMBER GIOIA: Thank you, Chair Nichols.

I really do think this was an important presentation to have.

As Chair Nichols has said, it is incumbent on all of us working with others to continue to get information out. I think so often people have become unfortunately

more skeptical of even very clear scientific conclusions of evidence. I think that's really unfortunate.

And what's so important often is the messenger becomes as important as the message. So that's why all of us folks here and many of the groups that we work with are important messengers. Because often times, people will believe things more when they hear it from somebody they trust, which is often someone they know, as opposed to someone who should be trusted like a scientist, including a few folks, physicians on our Board here.

So I think the issue is about increasing the universe of messengers who have relationships with others to be able to convey this information. I think that's important. The messenger is as important as the message. I appreciate the comments of the Chair in really encouraging this.

BOARD MEMBER BALMES: May I follow up?

CHAIRPERSON NICHOLS: Yes, Dr. Balmes.

BOARD MEMBER BALMES: Well, again, I'd like to add my thanks to Dr. Moser for that very good overview of mostly threats to the environment related to climate change, the environment that we have to live in. And you touched on some health issues.

But I would be remiss if I didn't stress that there are major public health issues related to climate

change. You mentioned I think very importantly that farm workers in the valley will not be able to work on the future scenarios that you outlined so well. But it's not just the farm workers. We won't be able to have construction workers work in the Central Valley without space suits. So there is that occupational health component which often is ignored when talking about climate change.

But in terms of cardiovascular and respiratory disease, there are major impacts from the heat, from the air pollution, from increased allergen exposure. And eventually, the people most vulnerable would get the double whammy of worse air quality and heat stress. So I I just wanted to underline that sort of area of climate change impact.

Now in response to Supervisor Gioia, there are groups that are working to try to get physicians to get out there with the message. The Lung Association of California has doctors for Climate Health Social Network. I just added my state photo and a little blurb about the importance of --

CHAIRPERSON NICHOLS: Dr. Sherriffs has already been featured.

BOARD MEMBER BALMES: I know. I'm just trying to play catch up.

But there is actually a national effort out of George Mason University. It's a Climate Change Communications Center, and there is a physician who just spoke at U.C. Berkeley yesterday who's been doing outreach to various physician groups, including the professional organization that I work with as a pulmonologist, the American Thoracic Society. We just published a survey of pulmonary physicians around the country, which no surprise most pulmonary physicians think that climate change is a problem. They believe it. And that they're actually already starting to see the effect in some of their patients. She's working with other physician groups as well.

So it's only one communications pathway, but I think it's an important one for the reasons that Supervisor Gioia mentioned.

And the final thing I want to say is something I learned for a fellow faculty member at Berkeley Robert Rice, who said, it's one thing you can get elected with ideology, but you have to govern the effects. So --

CHAIRPERSON NICHOLS: Good comment.

BOARD MEMBER GIOIA: Well stated.

CHAIRPERSON NICHOLS: Ms. Berg.

BOARD MEMBER BERG: Yeah, thank you very much for this update. And I just would like to piggy-back on the

outreach.

For most of us, the overwhelmingness of climate change is difficult to put into some sort of context or some kind of focus about what to do. And as these reports are critical for policy and government and leadership, as we're delivering the message, I think it's really, really important that we're delivering a message of what needs -- of what we're facing, but also what is being done. But more important, what one or two steps could every citizen take that would truly make a difference, that that way they have something to engage in.

As you were going through and it was really helpful to me as an ARB Board member to hear this, but quite frankly overwhelming and under what context as a citizen do I start other than the work that I'm doing here. And I know there are some things I could do. I know there's some choices as a consumer I could be making.

But when I look at things that suggest that we could be a day late and a dollar short and so what's the point, I've got other things that are facing me right now today I've got to make decisions on.

So I think in this education, if we really truly want to embrace and to engage citizens, that we really need to look at an educational mechanism that allows people to put this in context and really make two, three,

five critical behavioral changes that they make a difference today for their grandchildren tomorrow. So I'd really encourage that. And thank you so much for this report.

DR. MOSER: May I respond? I would love to respond, because we have two physicians here, I would like to relate this to work I've been doing as a communication expert on hope. What gives people hope.

Well, medical psychology is actually a treasure trove for that. I want to tell you what the ingredients of true hope, because I think all of you can include that in your outreach, in your speeches, in whatever you do.

It begins with a real diagnosis. No rosy, oh, it's not so bad. No. You tell people really what the issue is.

And the next thing is that you paint a picture of what is achieveable. What is the possible. This is work that's been done with terminally ill patients where basically the outlook is pretty dire. So what do you tell someone like that? Well, you might be healed. You might become well. You might have a longer life. You might die without pain. Whatever the achieveable goal is, be very clear about that.

And then paint a picture of the path. How do we get from this diagnosis to that positive outcome that is

realistically achieveable? And then how people understand that echoes very much what you just said, what can you do to help get there. What is my role as a patient to be part of this? And what will you do as the doctor?

So for you to say to people what they can do and what you, as Commissioners, as Board members will do or what the State does already is enormously important. So people see themselves as being part of a bigger solution. Changing a lightbulb will not answer that question if you are confronted with the kind of facts I just put there.

The next ingredient is what you will do in case of a setback. Because, you know, sometimes the chemo doesn't work. What do you do? Well, tell people what your plan is. And tell them they're not alone, that you will work with them to do this. So those are the actually five or six ingredients of any message of hope in a very severe circumstance. And I encourage you to use that recipe for your own communication.

CHAIRPERSON NICHOLS: There are actually some groups that are coming together to help, particularly, I know advocates to craft those kinds of messages. So this is a topic that we should perhaps take up later, either at a workshop or in a Board meeting, because I think there would be a lot of interest in that.

Any -- I'm sorry. Supervisor Roberts and that Ms. Mitchell.

BOARD MEMBER ROBERTS: Well, thank you.

One of the strengths of this Board is we all look at things somewhat differently. I would share with you I've been on the Board for a long, long time. This was without a doubt one of the best, most sobering presentations we've had on this subject. Appreciate that.

While I was sitting here, I was thinking sort of the opposite and Sandy was, how do we get people -- I'm thinking how do we get this message out? You've got a lot of information here. And what I usually see is Twittered about and these social media things where it's just sound bytes with no comprehensive picture here doing just the opposite. I was thinking we need to package a video. You've got great information. And I think in the right form, we can reach a lot of people. And I think everybody is looking for content that lasts more than a few minutes.

It could form the basis of -- I mean, I could see this thing being done, taken around and shared with people in other places that would be very effective. So I don't know what production capability we might have, but I sure think that would be -- maybe there is a way to --

CHAIRPERSON NICHOLS: I was chuckling because we have actually increased our ability to produce pretty good

quality material of that sort within the last couple of years. So there is some -- we may not be at the Hollywood studio level yet, but we can do videos.

BOARD MEMBER ROBERTS: I would really think about -- because you've got the information. You're a terrific presenter. I would like to encourage us to give some thought. I'd like to have to have access to something like that that I could share in all different kind of ways. So I would encourage staff to work with you to see what our almost Hollywood level production can do.

CHAIRPERSON NICHOLS: Thank you.

Ms. Mitchell.

BOARD MEMBER MITCHELL: Thank you.

Thank you so much for your presentation this morning. And as several people have noted, it's very sobering information.

And I think for us, we're sitting on this Board and thinking what an overwhelming task that we have before us. But one of the things that comes to mind as I think all of us sit here is here we are in California and we are working as hard as we can on these issues. One of the reasons we work so hard on it is because we also have air quality issues here. And we can see co-benefits on working on reducing greenhouse gases and reducing the pollutants that we are trying to reduce.

But we also sit here and think what is the rest of the nation doing? What is the rest of the world doing? I know there are some strides being made other places. But I also hear from our east coast friends what a bunch of kooks you are out in California doing some of the things you're doing. And I'd like to get your input on how that is going across our nation and what more can we do. I know we can do things in California. But how can we bring the rest of the world along with us and certainly the rest of our nation?

DR. MOSHER: It's a very good question. Just as a summative approach, the National Climate Assessment did have for the first time a chapter on mitigation. Not to tell anybody what to do, but it basically looked at do all these efforts that are going on at the local level, at the state level, do they add up to what they need to do? Basically they found that we're barely scraping sort of the bottom of this problem with what we're doing already.

I mean, this goes right back to the message that the IPCC had without additional efforts you will still see something like three and a half to five degrees of warming globally. We're actually not doing nearly enough. For me, the hope comes out of the history of environmental policy making in this country. And it typically goes like this. The state's, California among them, typically as

the leading ones, a few in the northeast, maybe eventually someone in the Midwest, starts to do something different. Then you have the different rules all over in these state laboratories, if you will, that basically make business very, very challenging. Because the rules change every time you cross the state line. And eventually, that really upsets the people in Congress or basically the business community that then go to Congress and say could you please level the playing field.

And then your experiments, the ones that are successful, are the ones that actually then will model what will be implemented nationally. This is how we got the Clean Air Act, the Clean Water Act, and many others.

So what more can you do? I think working with your neighboring states to bring them on board to show them how you're accomplishing what you're doing. Literally being out and showing the how-to of how you got to making these changes both politically, but also technically.

And those, to me, are the two key features. Figuring out the financing is obviously a big challenge. I don't need to tell you that. But I mean, that's what many of them are seeing, of course. It helps us with the natural gas prices where they are, the renewables becoming more affordable. So I think, you know, those are the

kinds of things that, in general, move the ball forward.

But I think your showing by example is probably the most important and forming coalitions with your neighbors that you already are tied with in the electricity and transportation, those are the kinds of things that at least from my perspective that have worked and I encourage you to do more of.

CHAIRPERSON NICHOLS: Supervisor Gioia.

BOARD MEMBER GIOIA: One additional thought. I think it is really important for us also to show that the steps that are being taken to address long-term climate change issues are having immediate benefits on residents of the state of California. I think that -- and they are. And the co-benefits that are achieved from many of the steps that have been taken on the energy efficiency side, just one example.

So I think drawing that link between the benefits we're getting today that we're not necessarily waiting for the benefits to occur decades down the road while they will. We're getting immediate benefits today. And I think that is important, because you're right. People look at how is this effecting me today. There will be people who will obviously adjust their actions because they want to make a difference long term. Others who will adjust their actions to get the immediate benefit. So we

need to show both. And I know we're doing that in some ways, but I think we can do even better.

CHAIRPERSON NICHOLS: One more, yes. Dr. Sherriffs.

BOARD MEMBER SHERRIFFS: It's such an important topic, I can't not. I also can't let the American Thoracic Society down. To remind people this is physicians everywhere, the California Academy of Family Physicians is on record. I'm looking at the California Medical Association. 40,000 doctors in California two years ago reiterated through its House of Delegates its support for the work of AB 32, our work here, and not incidentally coming up later today, stay tuned, low carbon fuel standard programs. So that's very important.

I really am looking forward to do a YouTube with Supervisor Roberts. And I really do appreciate these comments, because this is so constant with the kinds of things we do as doctors that we have to do. And it's such a great model in terms of a clear diagnosis, engendering hope, looking at not just the immediate benefits but the long-term benefits, and walking the talk, doing what we're doing. And demonstrating clearly to people what they can do and having a Plan B. I think that's also an important thing, because I think many people who are concerned and are terrified think, you know, this mitigation stuff, wait

a minute. That takes our eyes off the ball. We have to be doing prevention. We can't be spending a penny on mitigation.

I think the answer is no. There is a very good case we have to be doing both. We have to focus on prevention because in the long term that is the most cost-effective, the most important, leads to the fewest disruptions. But we do need that whole package. Thank you very much for your presentation.

CHAIRPERSON NICHOLS: I'm going to draw this to a close, only because we have a couple of other agenda items to address this morning. But I want to make just a couple of very short comments.

First of all, I'm delighted this presentation has set off a healthy competition on my Board. There is nothing like competition bring out the best in all of us. Thank you for that.

And thank you for a really thought-provoking presentation and for being available to us through your work as part of the California Climate Assessment as well. This is not the last time we will have an opportunity to take advantage of Dr. Moser's work.

In that regard, I want to just say two quick things. First of all, with respect to the fact that we are part of a global problem here and a lot of global

effort, I do want to call out the fact that going back to the original signing really of AB 32 by Governor Schwarzenegger and now intensified and given more concrete steps by Governor Brown, we have been engaged internationally in working with other regions of the world, work that California has done has been not only an inspiration and a model for programs in other places, but we have increasingly direct engagement at ARB and some of our sister agencies as well in technology transfer and benchmarking and communications with others, which has just expanded the importance of the work that we've been doing here at ARB.

And the other thing I want to say is that in your presentation -- and you pass over this somewhat lightly -- you noted that there is one area of at least somewhat good news mitigating all of this bad news, which is the apparent slowing or reduction of loss of forests and therefore the potential that there's some more ability to reverse what looked like a really terrible situation not that long ago and to come up with some ways to restore our ability to store carbon in our land and forests.

And this is an area where California is I think really just beginning to comprehensively take a look at other ways in which we can be a model. We have not had a comprehensive policy in this regard. The Governor did

mention it in his inaugural speech, and there's now a great deal more activity going on. Edie Chang is representing us with the Forestry Climate Action Team, which is working with the Resources Agency and that whole area of California's tremendous natural resource base that we begin with is really just kind of beginning to emerge as a full element of our climate thinking and planning.

And even though it's not as easy for us, particularly as ARB, to directly be involved in because we don't have the parts per million or the direct emissions to work with, we do actually have a responsibility in our role as the keepers of the AB 32 Scoping Plan for assessing, documenting, and monitoring what's going on in that area.

So just a thought really to plant here with everyone that I think this is going to be something we're going to increasingly be talking about in the years to come.

And with that, I want to thank you. And hope we'll see you again.

DR. MOSER: thank you so much.

CHAIRPERSON NICHOLS: We have the proposed readoption of the low carbon fuel standard.

For those planning their day, we are planning to take a lunch break. There is going to be an executive

session at lunch today. So we certainly will not get to the alternative diesel fuels item until after the lunch break.

Okay. New team taking their places here. We now proceed to the proposed readoption of the low carbon fuel standard. We're hearing this proposal today in response to a decision of a State Appeals Court that dealt with the procedural issues regarding our original adoption of the rule.

But in addition to the procedural aspects of this, we're also going to hear some proposed amendments that are designed to strengthen the rule and to make sure that it's sending the strongest signals for ongoing investment in low carbon fuels in California.

As I think everybody knows, the overall goal of this low carbon fuel standard is to reduce the carbon intensity of transportation fuels in California 10 percent by 2020. It's a key piece of the portfolio of AB 32 policies to cut greenhouse gas emissions to 1990 levels by 2020.

As we look beyond 2020, increasing volumes of low carbon fuels will be needed to meet the Governor's recently announced goal of cutting petroleum consumption in the state by 50 percent by 2030.

It's been five years since the Board originally

adopted the low carbon fuel standard. But the core principles that were embodied in the regulation remain valid. And the basic framework of the rule, including the use of life cycle analysis, as well as the creation of a credit market and a reporting tool, have been working -- have all been working quite well, despite the efforts over the years to undermine this rule or challenge its existence in a variety of different forums.

One of things we hear most frequently from businesses that we regulate is a need for certainty. And that's a very valid concern and one that we need to pay attention to. Certainty allows businesses to plan over the long term, gives each individual business the ability to comply in the ways that make the most sense for them. And right now, we think the best thing that can be done is to move forward in a way that will create as much certainty as we can, given that we have to always remain open to things that happen in the world of science, the world of technology, but we need to make sure that we are, in fact, sending a signal that includes as much certainty as possible.

We will be monitoring and adjusting elements of the program as necessary as we always do at ARB, but particularly given the sensitivity of gasoline as a commodity if the people in this state are perhaps

disproportionately reliant on. We need to be making sure that we continue to be watching what's going on out there.

But at the same time, we also can see there is a framework here that's needed and that we need to make sure that we're communicating and implementing in ways that will allow us to bring volumes of cleaner as well as increasingly affordable low carbon fuels into California.

So before turning this item over to the staff, the Executive Officer will introduce the item as usual. Just want to make sure that people understand the context that we're in today. The Board today will not be voting on the actual proposal. We will be listening and paying attention to the comments that we received already as well as those we'll get today and the written and the oral testimony as well as the written testimony. And we will be acting on a Resolution that will direct the staff to make any additional changes that are needed and to bring this item back for a formal vote a few months from now.

So this is a two-step process that we have to engage in as a result of the procedural requirements, which we are now fully implementing and so we will be listening. We'll be learning. We'll be directing the staff via a Resolution. The actual final adoption of the rule will not happen until there is an opportunity for one more hearing.

So with all of that, Mr. Corey, would you please introduce this item.

EXECUTIVE OFFICER COREY: Yes, thank you, Chairman.

As you stated the low carbon fuel standard is intended to reduce the carbon intensity transportation fuels used in California. Reducing carbon intensity will reduce greenhouse gas emissions and support the development of cleaner fuels with the attended co-benefits. Low carbon fuel standard is one of several California programs to reduce GHG emissions from transportation by improving vehicle technology, reducing fuel consumption and the carbon content, as well as increasing transportation options.

When the Board approved the regulation in 2009 and then its 2011 amendments, the Board directed staff to consider various aspects of the regulation, many of which are addressed in this readoption. Additionally, staff included updates and revisions compared to the original regulation to strengthen the signal for investments in the cleanest fuels, offer additional flexibility, update technical information, and provide for improved efficiency and enforcement for the regulation.

Now before I turn this over to staff, I'd like to note that Mike Waugh, many of you know is the face of the

low carbon fuel standard program for many years here retired at the end of 2014. And he helped us get the publication of this report, and we really appreciate the tremendous contribution Mike made and wish him well.

I'd also like to acknowledge Sam Wade, who has capably taken over the fuels group for Mike.

And with that, I'll introduce Katrina Sideco, who will give the staff presentation. Katrina.

(Thereupon an overhead presentation was presented as follows.)

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

Good morning, Chairman Nichols and members of the Board.

We are pleased to have this opportunity to present staff's proposal on the readoption of the low carbon fuel standard, or LCFS.

We want to remind the Board that this is the first of two Board hearings for this rulemaking and the Board is not being asked to consider adoption of the proposed regulation today.

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AIR RESOURCES ENGINEER SIDECO: In today's presentation, we will first provide background information on the LCFS as well as its current status. We will

discuss the proposed regulation, followed by its environmental and economic impacts.

We will then present areas of potential 15-day changes and conclude with a proposed time line for this rulemaking.

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AIR RESOURCES ENGINEER SIDECO: The Board approved the LCFS regulation in 2009 to reduce the carbon intensity, or CI, of transportation fuel used in California by all least ten percent by 2020 from a 2010 base line. The Board then approved amendments to the LCFS in 2011. This program is one of the key AB 32 measures to reduce greenhouse gas emissions in California.

The LCFS also has other significant benefits that are sometimes overlooked. It transforms and diversifies the fuel pool in California to reduce petroleum dependency and achieves the air quality benefits, which are two state priorities that precede the LCFS.

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AIR RESOURCES ENGINEER SIDECO: The LCFS is designed to reduce greenhouse gas emissions in the transportation sector, which is a responsable for about 40 percent of the greenhouse gas emissions, 80 percent of ozone-forming gas emissions, and over 95 percent of diesel particulate matter.

It is a key part of a comprehensive set of programs in California to reduce emissions from the transportation sector, including the Cap and Trade Program, Advanced Clean Car Program, and SB 375.

The LCFS is also a key program to achieve the Governor's goal of cutting petroleum use in half by 2030.

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AIR RESOURCES ENGINEER SIDECO: Other jurisdictions are following California's footsteps, which is evident in the Pacific Coast Collaborative, a regional agreement between California, Oregon, Washington, and British Columbia to strategically align policies to reduce greenhouse gases and promote clean energy.

One of provisions of this collaborative explicitly addresses low carbon fuel standard programs. Oregon and Washington have committed to adopting LCFS programs, while California and British Columbia have existing LCFS programs.

Staff has been routinely working with these jurisdictions, providing assistance where we can. Over time, these LCFS programs will build an integrated west coast market for low carbon fuels that will create greater market pull, increased confidence for investors of low carbon alternative fuels, and synergistic implementation and enforcement programs.

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AIR RESOURCES ENGINEER SIDECO: In addition, recent ICCT research finds that the clean fuel goals of all jurisdictions can be achieved simultaneously.

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AIR RESOURCES ENGINEER SIDECO: Now I want to briefly touch on how the LCFS works. The LCFS has a couple of key requirements. It sets annual carbon intensity standards, which reduce over time, for gasoline, diesel, and the fuels that replace them.

Carbon intensity is expressed in grams of carbon dioxide equivalent per megajoule of energy provided by that fuel. CI takes into account the greenhouse gas emissions associated with all the steps of producing, transporting, and consuming a fuel, also known as a complete life cycle of that fuel.

The LCFS is fuel neutral and lets the market determine which mix of fuels will be used to reach the program targets.

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AIR RESOURCES ENGINEER SIDECO: The LCFS accounting system is pretty straight forward. Fuels and fuel blend stocks introduced into the California fuel system that have a CI higher than the applicable standard generate deficits. Similarly, fuels and fuel blend stocks

with CIs below the standard generate credits. Compliance is achieved when a regulated party uses credits to offset its deficits.

Since the regulation was first adopted, the compliance curves have been back-loaded to allow time for the development of low CI fuels in advanced vehicles. Due to this program's design choice, there has always been the expectation that excess credits generated in the early years of the program would be available for use in more stringent future years, if needed.

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AIR RESOURCES ENGINEER SIDECO: Since the regulation went into effect, low carbon fuel use has increased due to the LCFS, the federal renewable fuel standard, and other factors.

Staff have continually monitored the program and found that regulated parties in the aggregate have over-complied with the LCFS standards in every quarter since implementation.

Even with the standards frozen at one percent, tangible results can be seen today. For example, the amount of renewable natural gas used in vehicles in California has increased by over 700 percent since the program started. The amount of biodiesel has quadrupled. Renewable diesel has grown dramatically to become more

than three percent of the total diesel market in California in 2013. And the average crude CI used by California refiners has remained below the 2010 base line, meaning that the carbon footprint of the crude slate has not increased.

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AIR RESOURCES ENGINEER SIDECO: This figure shows the total credits and deficits reported by regulated parties through 2011 up to the third quarter of 2014. For reference, one credit equals one metric ton of carbon dioxide equivalent. Cumulatively, through the end of the third quarter of 2014 there has been a net total of about 3.9 million excess credits.

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AIR RESOURCES ENGINEER SIDECO: This is the slide we've borrowed from our colleagues at the California Energy Commission who work on the Alternative and Renewable Fuel and Vehicle Technology Program, also known as the AB 118, which offers grants for low carbon fuel projects. The dots show the location of some of the major low carbon fuel investments that have been made in California.

As you can see, there is a lot of private and public capital flowing to this industry throughout the state.

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AIR RESOURCES ENGINEER SIDECO: This slide focuses on the shift of fuels generating credits in the program between 2011 and 2014. Credits so far have been generated primarily from low CI ethanol. The carbon intensity of ethanol has continued to decline, demonstrating that the LCFS incentives significant innovation, even for established biofuels like ethanol. The contributions from non-ethanol fuels, such as biodiesel, renewable diesel, and renewable natural gas continue to expand.

We've also seen a small but increasing contribution from electricity and hydrogen. We expect LCFS credits from these fuels to continue to increase as electric and fuel cell vehicles come into the California market in greater numbers.

I would also like to highlight the major contribution of renewable diesel at 16 percent of the credits in 2014. These charts demonstrate the ability of the LCFS to pull low carbon fuels to California.

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AIR RESOURCES ENGINEER SIDECO: The LCFS has two lawsuits, one federal and one state. These legal challenges have caused uncertainty in low carbon fuel investment.

The Federal Court of Appeals ruled in favor of ARB on some claims and remanded the other claims back to the district court for further proceedings. The State Court of Appeal found procedural issues with the way in which ARB complied with the California Environmental Quality Act, or CEQA, and the Administrative Procedures Act.

Specifically, the state court felt ARB did not fully consider the fact that the low carbon fuel standard may incentivize additional biodiesel use, which could potentially have a negative impact on air quality due to increased emissions of nitrogen oxides from higher blends of biodiesel compared to conventional diesel fuel.

Although the decision found ARB improperly deferred mitigation of biodiesel, the court allowed ARB to enforce the program at 2013 CI levels while addressing the court's concerns.

To address the ruling, ARB staff conducted an environmental analysis of the proposed LCFS regulation and proposes that the Board re-adopt the regulation and adopt the alternative diesel fuel regulation that directly mitigates potential NOx impacts from higher blends of biodiesel.

As we will describe later in this presentation, staff has conducted a joint environmental analysis of the

two rules to study this interaction and you will hear more about this during the alternative diesel fuel presentation later today.

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AIR RESOURCES ENGINEER SIDECO: In response to the lawsuit, we are proposing to re-adopt the entire LCFS regulation.

In addition to addressing the legal challenge, staff is also proposing revisions to improve the current LCFS. Although implementation of the LCFS has gone smoothly, there are opportunities to improve the rule.

Several factors are driving the staff's proposed revisions. First, based on stakeholder comments received in both the original 2009 rulemaking and the 2011 amendments, the Board directed staff to consider revisions to the regulation in specific areas.

Additionally, staff has received feedback from regulated parties and other stakeholders throughout the implementation of the LCFS, to which staff has been responsive.

Staff also identified proposed revisions for clarity and enhancement to the regulation based on our experience from five years of implementation of the LCFS.

Also, staff is incorporating the latest science and technical knowledge to update the tools used to

calculate the carbon intensity of fuels.

Finally, the readoption along with proposed revisions will provide certainty as we move forward.

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AIR RESOURCES ENGINEER SIDECO: Staff went through an extensive public process to engage stakeholder participation for this readoption. In addition to conducting 20 public workshops in 2013 and 2014, staff also conducted two advisory panel meetings in 2014. Staff has also initiated an external scientific peer review of staff's methodology in calculating Carbon intensity values. This process will be completed before the second Board hearing.

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AIR RESOURCES ENGINEER SIDECO: We will now discuss the proposed regulation.

So summarize the readoption of the LCFS, it is important to note that the LCFS is working and the core concepts remain unchanged. However, staff identified key areas of improvement, including updating the tools used to calculate carbon intensity to reflect the latest science, adjusting the 2016-2020 carbon intensity targets, and capping the credit price at $200 dollars per credit. We'll be talking more in detail about each of these improvements in the upcoming slides.

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AIR RESOURCES ENGINEER SIDECO: One of the key areas of improvement is our proposal to adjust the compliance curve. As mentioned, there has been an uncertain investment market due to the standards being frozen by the court to 2013 levels.

Thus, staff is proposing to adjust the target stringency from 2016 through 2019 to allow the market time to get back on track. However, the requirement to reduce the average carbon intensity by ten percent by 2020 will be retained.

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AIR RESOURCES ENGINEER SIDECO: So how do we see low carbon fuel deployment changing to meet our proposed compliance curve? This slide shows the current sources of LCFS credits in 2014 on the left and the projected sources of credits in 2020 in staff's illustrative scenario on the right.

In this scenario, we expect to see strong contributions from a balanced portfolio of low carbon fuels. Since this program is market-based, this is unlikely to be the actual fuel mix by which we achieve compliance in 2020, but it serves to illustrate staff's current best guess as to which low carbon fuels will be the strongest contributors.

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AIR RESOURCES ENGINEER SIDECO: The major 2020 sources of credits in this scenario include renewable diesel, biodiesel, renewable natural gas, and a different ethanol slate. Since we are benefitting from the zero emission vehicle program, electricity is also more significant in contributing them today.

This scenario includes a significant use of bank credits in 2020. This is due to the scenario's relatively conservative assumptions about low carbon fuel volumes. Staff felt it was appropriate to use more conservative volume estimates, due to the legal challenges to LCFS mentioned previously, and regulatory uncertainty in the federal renewable fuel standards.

If low carbon fuel investments accelerates faster than shown in this scenario, to 10 percent reduction could be achieved without banked credits used in 2020.

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AIR RESOURCES ENGINEER SIDECO: Another key area of improvement is updating the tools used to calculate the carbon intensity for each fuel.

In general, the CI includes a direct effects of producing and using the fuel, as well as indirect effects that are primarily associated with crop-based biofuels.

Two models are used to calculate the direct

effects which are the GREET model and the OPGEE model. To calculate the indirect effects, the GTAP model was updated and the AEZ-EF model was created to supplement GTAP's estimates of greenhouse gas emissions from various types of land conversions.

Staff conducted a robust stakeholder process to update these tools to reflect the latest science and is in the process of subjecting these updated tools to a final peer review.

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AIR RESOURCES ENGINEER SIDECO: The next two slides show the carbon intensity for both gasoline substitutes and diesel substitutes used in staff's illustrative scenario. This slide shows the changes between 2014 and 2016 for a few gasoline substitutes, with the existing values shown on the left and an updated value shown on the right for each fuel or blend stock.

Note that the emissions associated with indirect land use change, shown in orange, have gone down for all crop-based biofuels.

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AIR RESOURCES ENGINEER SIDECO: This slide shows the changes in staff's scenario for diesel substitutes.

Given the continuously evolving research in this area and recent written comments received from the Natural

Gas Vehicle Coalition, we do believe some continued technical work between the first and second Board hearing is warranted, especially for natural gas fuels. So we expect these values to change during the 15-day process.

Finally, we should note again that most of these CIs are merely representative values. Individual low carbon fuel producers have the ability to improve the specific carbon intensity value assigned to their fuel by demonstrating improvements through the pathway application process, which I'll discuss on the next slide.

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AIR RESOURCES ENGINEER SIDECO: To date, the fuel pathway application process has successfully determined individual CIs for over 230 unique fuels. Through this process, fuel producers have been able to receive credit for both incremental improvements to existing methods and innovative new production processes. However, the process has proven to be more resource intensive for all participants and staff than originally anticipated.

It is important to simplify this process for stakeholders in California's program and so other jurisdictions can adopt our approach. But an inherent trade-off exists between the simplicity and recognition of all actions that reduce carbon intensity.

Staff is proposing to streamline this process

using a two-tiered system to focus greater attention on next generation fuels, such as cellulosic alcohols, biomethane from sources other than landfill gas, hydrogen, electricity, and drop-in fuels. These advanced fuels will be eligible for a process very similar to the one currently in place.

Conventionly produced first generation fuels, such as corn ethanol, will still be able to receive credit for incremental improvements, but this recognition will be given using a simplified calculator, which will shorten staff review of these applications.

Helping all market participants adapt to this new approach and familiarize themselves with the updated tools will be challenging in the short-term, but is expected to create significant improvement in the long term.

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AIR RESOURCES ENGINEER SIDECO: The staff proposal includes new cost containment features. But before we cover the new addition, we'd like to first review the cost containment provisions we currently have in place and explain how useful they've been to the program so far.

One example is the trading of credits. The program has seen 530 credit transactions from 2012 through November of last year and about 2.7 million metric tons of

credits were traded in that time frame. Presumably, the purchasers of these credits saw these purchases as a lower cost compliance option than directly reducing the CI of the fuels they control.

Another example is that credits are fungible between the gasoline and diesel pools. In staff's illustrative scenario, over-compliance from diesel fuel substitutes is expected to help with compliance on the gasoline side.

The voluntary opt-in provision allows credits to be generated from sources not required to participate in the regulation. The carry-back provision also provides additional flexibility.

Finally, credits have no expiration date, so unlimited banking of credits is also permissible, which we will cover in detail on the next slide.

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AIR RESOURCES ENGINEER SIDECO: This slide shows more detail on how the credit banking provides flexibility in staff's illustrative scenario.

Here, you see the initial compliance curve prior to the litigation depicted by the gray dotted line. Here is what actually happened to the compliance curve so far, which is illustrated by the black line. You can see that the standards are frozen at one percent until 2015 due to

the lawsuit.

This green line shows the percentage of carbon intensity reductions so far. Due to the frozen standards, we can see a significant bank of credits being built up.

The percentage of carbon intensity reduction from staff's illustrative scenario is depicted by the green dashed line. We believe this scenario is a reasonably conservative estimate of how carbon intensity would change in the future, given the proper programmatic signals. Note that we show the rate of CI reduction increasing slightly in 2016 due to program readoption and again post-2020.

The black dotted line shows the compliance curve as adjusted by the readoption proposal. As you can see, there is a period where the projected CI may be higher than the standard. During this period, the credit bank allows time for low carbon fuel investments to accelerate.

Also, this figure makes it clear that future adjustments are likely needed post-2020 to address the Governor's 2030 petroleum reduction goals.

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AIR RESOURCES ENGINEER SIDECO: We are proposing to add a new cost containment provision called the credit clearance market to prevent price spikes in the unlikely event the market experiences credit shortages.

This provision provides consumer protection by establishing a maximum credit price, and thus a maximum impact on fossil fuel prices from the program. This also prevents short-term price issues that reduces the potential for market manipulation.

In the unlikely case there are not enough low carbon fuels in the market to comply, this provision will give regulated parties and ARB up to five years to make adjustments.

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AIR RESOURCES ENGINEER SIDECO: Staff is proposing to add a provision to give credit for greenhouse gas emission reductions made at refineries that supply fuel to California. This provision adds flexibility to the regulation and can also be thought of as additional cost containment as it introduces new potential sources of lower cost abatement into the program.

Example project types that would be eligible include solar steam generation or biogas to hydrogen for the refining process. Clear eligibility threshholds are established, and projects cannot increase criteria or toxic emissions.

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AIR RESOURCES ENGINEER SIDECO: Similar to the new refinery crediting provision, staff is also proposing

refinements to the existing crediting program to support innovative technologies for crude oil production.

The proposal refines the provision to better promote the development and implementation of innovative crude oil production methods. Major changes include an adjustment to the eligibility threshhold and the addition of new project types.

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AIR RESOURCES ENGINEER SIDECO: Per Board direction, staff is proposing to add a low complexity-low energy use refinery provision to this regulation to provide a benefit to smaller refineries.

A refinery would have to qualify as a low complexity-low energy use refinery by being below the threshold for both complexity and energy usage. If a refinery qualifies for this provision, it will be able to receive a credit for the refining step carbon intensity and will have a one-time opportunity to have a crude oil incremental deficit calculated on a refinery-specific basis.

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AIR RESOURCES ENGINEER SIDECO: Staff is proposing minor refinements related to electricity as a transportation fuel.

First, the proposal adds fixed guideway transit

systems and electric forklifts as eligible to generate credits. Fixed guideway transit includes electric light rail, trams, and buses.

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AIR RESOURCES ENGINEER SIDECO: Secondly, the proposal adds specific vehicle efficiency values for electric fixed guideway, buses, forklifts, and trucks.

Finally, due to the fact that consumer preferences of electric vehicle owners have not resulted in widespread installation of separate metering in residences, the proposal removes the transition to direct-metering in 2015 required by the existing rule and instead continues the current practice of applying estimation methods to calculate electric vehicle crediting.

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AIR RESOURCES ENGINEER SIDECO: Finally, staff is proposing to enhance the enforcement provisions of the program. Among these enhancements is clarifying the jurisdiction to include opt-in parties, registered brokers, and entities applying for fuel pathway certification.

Staff also clarified that the Executive Officer has authority to suspend, revoke, or restrict an account when violations have occurred or when an account is being investigated. Staff also defined a per-deficit violation

with a maximum penalty of $1,000.

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AIR RESOURCES ENGINEER SIDECO: Now we will go into the environmental and economic impacts associated with this regulation.

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AIR RESOURCES ENGINEER SIDECO: Staff prepared one draft environmental analysis, or EA, that covered both the proposed LCFS and ADF regulations because the two rules are inter-connected.

The draft EA was prepared according to the requirements of ARB's certified regulatory program under the California Environmental Quality Act, or CEQA. The analysis focused on changes in the fuel production, supply, and use.

The existing regulatory and environmental setting in 2014 is used as the base line for determining the significance of the proposed regulations impacts on the environment.

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AIR RESOURCES ENGINEER SIDECO: The LCFS and ADF will result in beneficial environmental impacts to greenhouse gases, air quality, and energy. In combination with other state and federal GHG reduction programs, implementation of the proposed LCFS and ADF regulations is

anticipated to result in environmental benefits that included an estimated reduction in greenhouse gas emissions of more than 60 million metric tons of carbon dioxide equivalent from transportation fuels used in California from 2016 through 2020.

Lower carbon diesel fuel substitutes would result in beneficial air quality impacts for particulate matter, carbon monoxide, toxic air contaminants, and other air pollutants. Specifically, the estimated total reduction of PM2.5 emissions would be more than 1200 tons from transportation fuels in California from 2016 through 2020.

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AIR RESOURCES ENGINEER SIDECO: The draft EA identified less than significant impacts to certain resources, such as minerals and recreation. However, potential significant impacts were identified in a number of resource categories, such as agricultural, biological, hydrology and water quality. Significant cumulative impacts were also identified for many resources.

While some of these identified impacts are related to long-term operational changes, others are potential short-term effects related to construction of new fuel production facilities.

This is a programmatic analysis. To the extent new fuel production facilities are built, the location of

the facilities and consequently their specific environmental impacts will not be known until development plans are announced and local permits are sought. The site-specific environmental impacts would be analyzed at that time by the permitting authorities, which will typically include local air districts and land use agencies.

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AIR RESOURCES ENGINEER SIDECO: Because the ADF and LCFS proposals were so interlinked, the macro-economic impacts of the proposals could not be disaggregated. Therefore, the evaluation was completed using the simultaneous effects of both proposals on the fuel volumes and prices.

Staff employed a conserve extensive automotive framework. It assumed all costs to the regulated parties are passed on to customers. It does not assign a monetary value to climate protection benefits associated with fewer greenhouse gases, health benefits associated with reduced criteria pollutants, and toxic air contaminants or benefits due to reduced oil dependence. Also, unlike the environmental analysis, it does not account for interactions with other policies.

Finally, it does not assume any reduced cost due to innovation and low carbon fuels.

All of these assumption directionally reduce the estimated economic benefits of the proposed rule but capture the potential costs of the rule.

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AIR RESOURCES ENGINEER SIDECO: The macro-economic portion of the economic analysis was conducted using the regional economic models incorporated, or REMI, tool.

Together, the LCFS and ADF were found to have very small impact on California's gross state product and have very small impacts on employment. Even under the conservative assumptions employed by staff, impacts of the proposed rule are very small, considering the size and diversity of California's economy.

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AIR RESOURCES ENGINEER SIDECO: Taking a simplified firm-level view of the economics of the proposed rule, we can see how the value of the LCFS credits creates a shift in fuel producer costs. The LCFS credit value benefits the producers of low carbon fuels significantly on a cents per gallon basis. For example, if credit prices were to rise to $100 per ton, the average biodiesel producer would benefit by emission inventory than a dollar per gallon in 2020, as shown in the orange bars.

Even if credit prices were to remain near current levels around $25 per ton through 2020, the benefit to low carbon fuel producers is noticeable, as shown in the blue bars.

However, covering LCFS deficits increase the cost of traditional fossil fuels only slightly on a cents per gallon basis because the costs are spread over such a larger volume of fossil fuels.

Also remember that these values are presented for the full 10 percent reduction in carbon intensity in 2020. For a fixed credit price, benefits to low carbon fuel producers at a given CI are larger in the earlier years of the program because they generate more credits relative to the more lenient early years of the standard. Costs associated with high carbon fuel producers are lower in earlier years because they generate fewer deficits relative to the standard in the early years.

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AIR RESOURCES ENGINEER SIDECO: Moving forward, the second Board hearing is tentatively scheduled in the summer of this year. Between now and the second Board hearing, staff is planning additional stakeholder coordination to further refine the proposal we presented today. We are also proposing 15-day changes which we will cover in the next slide. Should the Board re-adopt the

LCFS with proposed revisions, the implementation of the improved LCFS would begin on January 1, 2016.

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AIR RESOURCES ENGINEER SIDECO: As I mentioned, staff has identified a few areas of potential 15-day changes. Staff will continue to update the GREET model with a special attention to natural gas vehicle issues. Staff will also work to clarify the refinery investment provisions further.

We've listed a few minor areas of possible adjustments, including the inclusion of indirect land use change CI values in the regulation, revising the reporting parameters for electricity, and moving the program review forward to 2017.

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AIR RESOURCES ENGINEER SIDECO: Finally, these are our next steps before the next Board hearing. The environmental review of the proposed LCFS and ADF regulations will be completed.

Staff will prepare written responses to environmental comments and undertake any needed updates to the draft environmental analysis released in December. We will also complete the external per review and work with stakeholders to draft any 15-day changes needed.

This concludes my presentation. And we thank you

again for the opportunity to present staff's proposal on the readoption of the low carbon fuel standard.

CHAIRPERSON NICHOLS: Thank you.

I have a list in front of me of 41 witnesses, and I understand there is another page coming. So we have some work to do here.

I would note with our Board packet we received a list of the written comment log, which is also very extensive. I actually had an opportunity to look at a number of these. But there is about 65 of them at last count. And so for those who have already commented in writing, just know that this material is also in front of the Board.

BOARD MEMBER SHERRIFFS: Can I ask a short question?

CHAIRPERSON NICHOLS: Yes, sir.

BOARD MEMBER SHERRIFFS: Thank you for that. Actually clarified a lot.

On your slide about the impact on gross state product and deployment, that is all cost. There is no consideration of potential benefits in terms of decreased health costs; correct?

TRANSPORTATION FUELS BRANCH CHIEF WADE: That's correct.

CHAIRPERSON NICHOLS: Okay. Thank you. So let's

begin. And our first witness -- the list is broadcast up there on the wall, so you can keep track of where you are on the left. Begin with Tim Taylor and then Matt Miyasato.

DIVISION CHIEF FLOYD: Madam Chair, we asked our colleagues from the Energy Commission to speak.

CHAIRPERSON NICHOLS: Of course. Yes. Mr. Olson, sorry. I had a note and I forgot about it. Welcome.

MR. TAYLOR: Thank you, Chair Nichols and members of the Board. Tim Taylor. I'm the Division Manager at the Sacramento --

CHAIRPERSON NICHOLS: I apologize. We're going to call on our colleague from the Energy Commission first. Another Tim.

MR. TAYLOR: Which Tim was it?

CHAIRPERSON NICHOLS: The better looking one.

(Laughter)

MR. OLSON: Thank you very much for allowing us to make a comment here.

The California Energy Commission supports the proposed action over the next few months to re-adopt the low carbon fuel standard. And we'd like to note the success of the Energy Commission's incentive funding, you had a brief look at it here in the presentation, the

Alternative Renewable Fuel Vehicle Technology Program is dependent on and compliments the LCFS.

Just to give you -- you had some information on some of the projects. Over the last five years, the Energy Commission has awarded over $547 million in awards and matched with an equal amount of private investment for projects in California. Of that amount, over close to $160 million awarded for 43 biofuel, biomethane projects, with average carbon intensities of 28 grams of CO2 per megajoule. There's some negative and some a little higher than that. But that's the average.

And they all qualify for LCFS credits. All those projects are in various stages. Some of them are advanced in commercial. Some of them are pre-commercial. Most of them are expected to produce pretty significant quantities in the next -- by 2020. So we're going to be adding more performance there.

That's significant for another reason. Right now, California imports 80 percent of its biofuels that we use today, and we think that in-state development is an important aspect. LCFS is a big contributor to that to make that work.

Also would like to -- we also appreciate the ongoing interaction with ARB staff mutual exchange of information and analysis, which has been used in our

policy documents, notably the integrated energy policy report, our annual report to the Governor and Legislature. We use your analysis a lot in that process, particularly the LCFS and the ZEV mandate and other programs. And it helps us in justifying the expected forecast of transportation energy supply. And what we're seeing is a shift from petroleum to alternative fuels. And we look forward to that continued interaction.

And at this point, we just wanted to Support your activity. Thank you very much.

CHAIRPERSON NICHOLS: Thank you very much.

By way of a partial explanation from my factitiousness there, it is a fact that the relationship between the Energy Commission and the Air Resources Board around this program is a very close and interdependant one. But the Legislature in its wisdom chose to give ARB the regulatory authority and the Energy Commission the money. So there we go. That's why we call them good looking.

MR. TAYLOR: Thank you so much for clarifying that. Now I can say the nice things about the Energy Commission that I was planning to say.

I'm Tim Taylr, Division Manager at the Sacramento Metropolitan Air Quality Management District here today to speak in strong support of the low carbon fuel standard.

As you heard in your staff report, transportation is a very significant part of the greenhouse gas emission inventory. Reducing the greenhouse gases from this sector of the economy is critically important if we're going to meet the standards that have been set. Your Board in cooperation with handsome folks from the California Energy Commission has accomplished a great deal toward lowering these emissions through programs encouraging more efficient vehicles, electric and alternative fueled vehicles, and regional transportation planning to reduce VMT. But as your own staff's analyses have shown, without lowering the carbon content of the fuels themselves, it will not be possible to achieve the standards that have been set.

The low carbon fuel standard creates regulatory certainty and will spur economic and technology development. In our region alone, we have hundreds of natural gas vehicles currently ruining on renewable natural gas from food waste and landfill gas. We have electric vehicles running on electricity that's made from renewable electricity, solar, wind, and from renewable methane. We're working to develop a pilot renewable diesel project here in Sacramento. E85 is readily available in our region.

In summary, the technologies exist and they're

increasing. The need is obvious. The Sacramento Air District strongly supports the low carbon fuel standard, and we encourage you to adopt it when it comes back to you for adoption. Thank you very much.

CHAIRPERSON NICHOLS: Thank you, Mr. Taylor.

Mr. Miyasato.

MR. MIYASATO: Thank you, Madam Chair, members of the Board. Also want to acknowledge Council Member Mitchell who also sits on our Board.

So by way of for the record, I'm Matt Miyasato, the Deputy Executive Officer for Science and Technology Advancement at the South Coast Air Quality Management District.

I'm here on behalf of my boss, my Executive Officer Dr. Barry Wallerstein. That's to voice our support for the low carbon fuel standard and your staff's recommendation to re-adopt the standard. We believe this regulatory mechanism is important not only for reducing greenhouse gas emissions, but more importantly for our region for getting co-benefits and reducing criteria pollutant emission benefits that your staff highlighted in the environmental impact assessment.

In particular, we believe the widespread use of fuels that you've identified in particular, natural gas and hydrogen, those that give us zero tailpipe emissions,

reduce toxics, reduce PM, but especially for our region, reducing NOx emissions will help us meet our attainment goals to achieve federal standards.

We support the LCFS adoption, and we urge your approval when it ultimately comes back for your vote. Thank you.

CHAIRPERSON NICHOLS: Thank you.

MS. Passero.

MS. PASSERO: Good morning. Michelle Passero with the Nature Conservancy. Thank you for the opportunity to comment.

I'm here on behalf of the conservancy to voice our strong support for the readoption of the low carbon fuel standard. It's critical to the programs, both the short-term and long-term goals of reducing emissions in California and in setting a precedent for other regions.

And as you already mentioned, there is a need for certainty for investments in new technologies and transitions to an expansion of low carbon fuels.

So being optimistic about the readoption of the LCFS, we also want to continue working with ARB staff and the Board to encourage implementation of best practices for these new technologies and new fuels to help minimize any trade-offs and also to encourage multiple benefits.

And also, we hope to consider third party

certification programs that can help with implementation of best practices. We did submit a letter along with other NGOs, so there's details in that, and we're certainly happy to follow up and help. So thank you very much.

CHAIRPERSON NICHOLS: Thank you.

Mary Solecki. Is she here?

Gina Grey, WSPA.

MS. GREY: Good morning, Madam Chair, Board members, and staff.

My name is Gina Grey. I'm with the Western States Petroleum Association. We have submitted about 93 pages of written comments for the record, so I'll just try to touch on a few points today.

First, I'd just like to say in case there is any doubt on the member -- the Board member's part about what our position is in our industry, we do still oppose the low carbon fuel standard, as you can imagine. Not so much for the actual goal, which is to reduce obviously transportation sector emissions, but it's more about the policy structure.

Originally, ARB had a lot of optimism in 2009 when the program was cast as a transformative regulation that was going to save the State approximately $11 billion in the ten-year period, as well as produce obviously a lot

of in-state jobs and low carbon fuel facilities.

From what we see in this proposed program today seems to be a bit of emission creep whereby the original central goal was to foster innovation and transportation fuels. It seems to have morphed into a program that attempts to satisfy ever-more objectives.

The staff now proposes to include several credit-generating measures in the reauthorization package, along with a cost containment mechanism to fill what we credit to be the fuel CI gap. And we still believe the compliance schedule is infeasible, which I'm sure you've heard a lot of. Very low CI fuels, such as cellulosic ethanol, have not materialized in the forecasted volume, but there is an over reliance as well on the significant volumes of credits that have been generated early in the program.

We contracted again with the Boston Consulting Group to update a number of studies that we have been doing with them since 2010. And they have concluded that approximately 5.1 percent is the sustainable reduction that can be achieved by 2020 through the use of both fuel and the credits.

To touch on cost, I would just say that some folks are now saying that credit costs must rise to around $200 per metric ton in order for the program to be

effective and transformative. In addition, there seems to be a duplicative accounting taking place by other states that are embracing the LCFS. The increased competition for the limited fuel volumes and the credits may lead to some interesting market dynamics.

There have been several recent ARB presentations characterizing the LCFS program as a success. Although there has been movement in lower CIs in terms of corn-based ethanol, an increase in renewable diesel and biodiesel use, for example, we basically don't feel that this defines success while we're under a one percent compliance target at the moment in that kind of a world.

And as well, we don't believe that having credit costs rise to approximately $85 a ton during the initial part of the program before the credit freeze and having them draw it back down defines success.

To summarize, we have two things to ask of the Board today. One is we obviously request ongoing staff reviews. And rather than what was in the program in terms of the dates in there, we would like to have those be on an annual basis that would allow stakeholder input and also help the Board help track of the health of the program.

The second is that we request no further effort on ARB's part to create any post-020 LCFS targets. That's

it.

CHAIRPERSON NICHOLS: Okay. Thank you.

Mr. Clay.

MR. CLAY: Good morning. Thank you for the opportunity to testify today.

I'm Harrison Clay, the President of Clean Energy Renewable Fuels. We are the largest producer, marketer, and distributer of biomethane vehicle fuel in the state of California. We produce and sell biomethane under the trademark Redeem.

In 2013, we sold 14 million gasoline gallon equivalents of Redeem in California. In 2014, we sold 20 million gasoline gallon equivalents. This year, we project we will exceed 40 million gasoline gallon equivalents of biomethane vehicles sold through clean energy stations.

This growth is a sign the LCFS program is working. It's creating incentives for companies like ours to get ultra low carbon fuel out to California's fleets. All of the CNG, LNG, the clean energy sales today from our retail CNG and LNG fuel stations is biomethane. That's a tremendous accomplishment and one we're very proud of and one that wouldn't have been possible without the LCFS program. As such, we are obviously strong supporters of the program and encourage the Board to re-adopt the rule.

We do have concerns about the administration of the rule. Really, there are two fundamental principles which I think are vital to the continued success of the the LCFS from the perspective of fuel producers like us. One of them is the regulation continues to be technology neutral. It is crucial that the staff and the Board administer the regulation in a way that allows for the lowest cost best performing low carbon fuels to come to market without interfering with the process or, for example, setting carbon intensity numbers based on political preference or an idea of what would be ideal under the right circumstances.

Regulatory stability and certainty is crucial. When CI numbers are published for fuel pathways, the business community, the fuel producers, we depend on those numbers. We count on those numbers. We have investment expectations that are set based on those numbers. And those numbers need to stay the way they are unless or until there is overwhelming unambiguous third-party scientific evidence they need to be changed. That is really crucial. If we end up in a situation where carbon intensity numbers become a matter of advocacy or subjective opinions of what kind of fuel is the best fuel for California, the regulation will really be threatened and the ability to raise money and put money into

production of low carbon fuels will be compromised.

With that, I would like to again thank you for the opportunity to testify and that concludes my remarks.

CHAIRPERSON NICHOLS: Great.

Before we get to the next witness, Ms. Solecki who was number four, returned. Please come forward and we'll hear from you now.

MS. SOLECKI: Sorry about that. I was just trying to make an entrance earlier.

My name is Mary Solecki, and I'm the Western States Advocate for E2. And I'm here on behalf of E2's 600 California members that believe that the LCFS is a vital way for us to reduce our greenhouse gas emissions and to diversify our transportation fuels in the state.

And we have been really enjoying working with staff over the past -- well, not just this year, many years to refine and enhance the LCFS.

We are looking forward to continuing to work with staff to refine and enhance the LCFS. And we would just urge you to re-adopt the LCFS when it is time for your vote. And we look forward to continuing to work on this really important program and support it. Thank you very much.

CHAIRPERSON NICHOLS: Thank you.

Mr. Heller.

MR. HELLER: Good morning, Madam Chair, Board members and staff. Miles Heller with Tesoro. We are a supplier of fuels in California and obligated party in the LCFS.

CARB staff has worked extremely hard to craft this regulation to meet the Board's goals. However, in our opinion, this is an impossible, given the availability and blending constraints of alternative fuels and the complexities of this proposed regulation.

Given the brief comment time today, I ask the Board carefully consider the written comments submitted by WSPA and other obligated parties as the compliance buck stops with us. Tesoro's door is always open should you have questions about our comments.

Putting aside our view of fuel constraints, I would like to discuss CARB's illustrative compliance scenario which can be found in Appendix B, Table B 22. Taking their numbers at face value and focus on the reliance of banked credits. CARB's own numbers indicate some infeasibility. That by 2019, the credits that are generated from available fuels will not be adequate to offset the deficits generated in that year.

By 2020, there is a considerable gap. Only 70 percent of what is needed will be generated and the availability of credits for gasoline is only 36 percent of

what's needed. That is the light green pie slice you saw in our presentation.

The only way the obligation is met in these years and beyond is by utilizing banked credits. These will run out. This is not sustainable. And we do not think that designing a program to rely on banked credits is wise. This is like telling a student at the beginning of a semester they will fail the final exam, but they can still pass the class if they do extra credit projects throughout the semester.

This does not bring certainty. And moreover, we believe overreliance on banked credits is flawed. First staff projections of credit accumulation in this scenario have already proven to be overly optimistic. Based on the most recent quarter, the projection is already off.

Secondly, CARB presumes all credits will flow to match the need in both quantity and timing. It is not prudent to assume that obligated parties holding credits will sell to competitors at any price, particularly when they believe the credits will run out. Tesoro recommends CARB set the compliance schedule based on reasonable assumptions of fuel availability and blending capabilities and allow extra credits to be used for compliance margin in the hedge of future shortages.

On a positive note, Tesoro appreciates CARB staff

including language enabling refinery GHG reduction projects. We think this is a level playing field for all the other components and the life cycle analysis. While we support the concept, we find that some of the provisions CARB has proposed creates barriers that will significantly limit the credits from these projects. I cannot go through these limitations now, but we discussed solutions in our written comments. We discussed our concerns with staff and have expressed the willingness to work on these in the 15-day process. We ask the Board direct staff to help us in this regard.

Thank you for your time.

CHAIRPERSON NICHOLS: Thank you.

Mr. Miller, could I -- since you're the first individual company to come up, I want to just clarify one thing.

As I read the staff report, they're not suggesting that you should comply using credits. They're just showing that as sort of the default if you will that indicates that the 2020 goal is not out of sight or out of reach.

But I hope you don't take this as meaning that we don't think you should be accelerating your efforts to develop and bring in other lower carbon alternatives that would help you comply. I mean, that's not the goal to

have credits be the major way in which companies comply.

MR. HELLER: No. I certainly understand that. We've been bringing in the fuels to meet our compliance obligation and exceed it in some cases.

But the question becomes in the future when there is not even enough fuels available to do that, then you're left with using whatever credits have been banked in the system. And that's what I was trying to highlight.

CHAIRPERSON NICHOLS: Okay. Thank you very much. Appreciate that.

MR. ECONOMIDES.

MR. ECONOMIDES: Good morning, Madam Chair, members of the Board, staff.

My name is Nick Economides. I'm the Manager of state fuels regulation at Chevron. We, too are a regulated party under LCFS and a member of WSPA. And we have submitted extensive written comments for the record that we are sure you are going to take a look at. I will try to summarize some of my key points from that submission.

Chevron has worked closely with ARB over the period going back to last March on the proposed LCFS readoption, and we have outlined our concerns on the proposed revisions of the program. We appreciate staff's openness throughout that process, and we recognize that

substantial refinements have been made in some areas. For example, the target CI reduction goals for 2016 through 2019. We remain hopeful that we will be able to continue working closely with staff in the coming months as the final package is prepared for your consideration.

Having said that, the LCFS program in our view will likely fall short of its original intended targets and should be adjusted to more accurately reflect the real world rate of development in market penetration of advanced low carbon intensity fuels.

Simply put, advanced cellulosic fuel development has not proceeded at the rate originally envisioned by ARB, and Chevron has first-hand knowledge of this. We have invested heavily in aggressive programming technology and regretfully we have not been successful. Staff's recognizes a challenges that lie ahead of us. Unfortunately, they're insufficient, as the previous speaker said, to establish the sustainability of the program. The Board should look beyond targets that are met largely through accumulated credits and weigh heavily where the program can stand on its own two feet. I.e. in any one single year, will there be enough CI reductions generated to match what is needed for that year?

Chevron's view is that the proposed 2020 target of 10 percent is essentially aspirational. It depends on

unrealistic credit build up leading up to 2016, bigger than justified contributions from renewable biogas and renewable diesel and unsubstantiated credits from refinery efficiency projects.

I will conclude by coming back to something that was said earlier regarding strategy and certainty. We advocate that this program should bring certainty to the regulated community. We know you share that objective. But this strategy of setting higher-than-achieveable goals denies the regulated community the strategy needed to go forward. And it continues the climate of uncertainty that has shrouded this program since its inception.

We would like to be able to turn our attention to compliance, to implementation, to know that we have something that we can achieve and to go off and get it done. And until this happens, I'm afraid we will be here again meeting you shortly to discuss further adjustment to the program's goal. Thank you for your time.

CHAIRPERSON NICHOLS: Thank you.

Melinda Hicks and then Dayne Delahoussaye.

MS. HICKS: Chairman Nichols, members of the Board, thank you for the opportunity to come before you today and provide testimony.

My name is Melinda Hicks. I'm the Environmental Health and Safety Manager for Kern Oil and Refining

Company, a small independently-owned refinery located in Bakersfield.

Kern refines approximately 26,000 barrels per day of crude oil for the production of CARB gasoline and diesel. And Kern is proud to say that we have continuously operated without fail since the 1930s, surviving a difficult industry through economic downturns and increased regulatory burden. Where many others cannot say the same.

Further, Kern is proud to say we have embraced the LCFS, being the first refiner in the state to produce renewable diesel and one of the first to blend biomass-based diesel with CARB diesel.

Overall, Kern is supportive of the proposal. We would like to highlight our support in three separate specific provisions today:

First, Kern strongly supports the low complexity, low energy use refinery provision. This provision addresses an inequality inherent to the program's reliance on the average refinery to fit the extremely broad range of refineries that operate in California.

Kern is grateful that the Board previously directed staff to consider such amendments. Certainly, years of extensive staff analysis using refinery data and stakeholder input have resulted in the low complexity, low

energy use refiner provision. And the ISOR clearly lays the strong scientific and technical basis for both the magnitude of the credit and the criteria for eligibility. The provision will correct what has been a disproportionate negative impact on refineries like Kern that do not fit the average.

Second, Kern supports the refineries specific incremental deficit option. Kern is encouraged that staff acknowledges that refiners like ourselves can be adversely impacted by the California average crude CI, but themselves cannot effect the sector-wide average. This provision gives us the option to be individually evaluated based on our own base line.

Third, Kern supports the refinery investment credit and appreciate ARB's incentive to perform projects that will reduce a facility's carbon intensity through real GHG reductions.

Of course, I would be remiss this morning were I not to say many thanks to staff for all of their dedication and endurance in working with Kern over the past few years. Thank you.

CHAIRPERSON NICHOLS: Great. Thanks.

Mr. Delahoussaye.

MR. DELAHOUSSAYE: Good morning. My name is Dayne Delahoussaye, and I'm here on behalf of Neste Oil.

Neste Oil is supportive of the readoption program, and I just want to take the time to testify to give additional context for your consideration.

We, along with many other low carbon fuel producers, made significant capital investments in response to the LCFS implementing the demand for renewable and low carbon fuel. Specifically, we invested well over two billion dollars as part of our global capacity. Changing the course or significantly alter the goals of the program at this late stage will have a severe chilling effect on any future potential investments as participants, investors in capital markets will lose confidence in California's commitment to follow through with its policy goals.

According to readoption of a stable LCFS is necessary as a next step to fulfill the commitment California has made to those producers to support those investments and realize true change in the air quality resulting in California's transportation fuels.

Implementation of a stable low carbon fuel standard in California will send a proper signal to fuel producers like Neste Oil and will provide a significant driver to draw low carbon fuels to the state and adequate volumes to comply with the target of 10 percent carbon reduction.

In addition, the stabilization, the ARB should use this readoption conversation as a spring board to begin to formulate and implement longer-term targets. Producers cannot recoup large capital investments in short economic cycles. We support the investments and continue growth and production of low carbon fuels. The market will require signals effective and robust beyond the 2020 time frame currently at issue here.

Additionally, proper implementation of the program is paramount to the success of the LCFS, not just design. The LCFS receives staff's continued ability to timely process and approve complete pathway applications as an obstacle to additional volumes of carbon fuels to be available to California.

Fuels with lower carbon intensity by definition have a higher economic return on the system. However, absent the confirmed CI determination, a producer might reduce fuel production or send the fuel to a more economical market outside of California. Removal of those barriers to otherwise credit generating fuels through the California transportation fuel could generate shortage not because of a failure of the market or program design, but again as a failure of just timely implementation.

And we encourage the Board to work with staff to put an approval process in place to make new fuels that

are compliant yet timely and prompt CI scores so they can participate in the fuel to generate credits.

The final thing I want to talk about is I heard some potential comments about the blend levels of renewable diesel and that can be an obstacle. I would encourage the Board to not give that significant value, that that are high values and renewable diesels being available as compliant within California.

Additionally, we see the path forward for getting different labeling solutions being feasible and something that can be likely achieved in the short term and not going to be a long-term detriment to the 2020 goals and the use of this particular combined fuel.

I'm available for any questions, should you have any.

CHAIRPERSON NICHOLS: Yes.

BOARD MEMBER SPERLING: One quick question.

What do you think of the $200 price cap for credits?

MR. DELAHOUSSAYE: The $200 price cap I don't have a basis for and it the current economic it makes sense. But that assumes that there is a valid rent in place with the federal program and that. Absent the federal program that seems to be an arbitrary number that does not support California on its own. So 200 dollars I

would say is only valid in this up to 2020 period anything beyond that I think need to be re evaluated and needs to be viewed in cooperation with the federal mandate that already exists for these fuels.

CHAIRPERSON NICHOLS: Thank you.

Mr. Grimes.

MR. GRIMES: Good morning, Chairman Nichols and Board members. I'm Gary Grimes, Director of Technology at Paramount Petroleum, an Alon USA company. Alon owns and operates two small refineries in Southern California. We strongly support the Board's decision over two years ago to recognize the differences between the state's smaller lower complexity refineries in its larger higher complexity brethren.

We wish to thank your staff for quantifying this difference and developing a workable regulatory mechanism that is included in today's proposal.

The LCLE provision, as it's known, appropriately accounts for the reality of California's two distinct refinery populations. Lower complexity refineries produce gasoline and diesel fuel using less than half the energy in carbon intensity per gasoline of the larger complex refineries. This is the sound technical reason behind the policy recognized in the LCLE category. Alon supports the inclusion of the LCL provisions.

Although our Bakersfield refinery has not been in full operation since the bankruptcy proceeding a few years ago, the facility still maintains small operation and contractually delivers fuel from its racks.

Also, there is considerable engineering and permit work being done at the local level to allow restoring much of its previous operations. At such time when it comes back, its carbon intensity profile will fit within the small refinery grouping. Therefore, it's important to get the eligibility criteria right during this rulemaking.

On that front, Alon has been working with staff to ensure that the LCLE provisions incorporate all facilities that should be considered LCLE. These discussions are ongoing, and we look forward to positive resolution before the next Board meeting.

Besides the enormous local benefit to Bakersfield of operating this existing energy asset, there will be an ongoing benefit as well to the state. Annually, the refinery emissions associated with the fuel production from the Bakersfield refinery are expected to be 350,000 metric tons of CO2 lower than the fuel that was produced by an average California refinery. This is clearly a significant and material reduction for this program.

In conclusion, Alon's respectfully supports the

LCLE provision and looks forward to a continue dialogue on this issue. Thank you.

CHAIRPERSON NICHOLS: Great. Thanks.

Celia.

MS. DU BOSE: Good morning, Chair Nichols, Board members, and staff.

My name is Celia DuBose. I'm the Executive Director of the California Biodiesel Alliance. We are the industry trade association for biodiesel. We represent over 50 stakeholders, including feedstock suppliers, distributors, marketers, retailers, and all of the state's producers.

So I'm happy to be here today in support of comments from the National Biodiesel Board, which will be coming up, and to stand with the low carbon fuel sector in urging your support of the readoption of the low carbon fuel standard.

First, I want to thank staff for the extraordinary effort that they put out in gathering comments, incorporating these comments, drawing on your own experience from running the program to build a better LCFS. And we value very much in all of this there is a high priority placed on creating a stable regulatory environment as key to the investor community.

So our industry has gone on record in support of

the compliance curve, the price cap. And we've let you know just how much biodiesel is available to reach program targets. In addition to our 59 million capacity in state, there is over 1.5 billion gallons of biodiesel. And to put a very fine point on this, this is an advanced bio fuel. It's renewable. It's non-toxic. It's biodegradable. It's American made.

So bio diesel has generated an increasing number of LCFS credits since the program began. Our cumulative number is up to 13, as of the third quarter in 2014. And we are growing. Our industry in the state has grown as a result of LCFS as an incentive. We expect that to continue. We are really happy about our ability to bring the low carbon profile of biodiesel, this emissions profile, to the goals of LCFS. And we look forward to being able to provide more biodiesel benefits to other programs, which we'll talk about later. So thank you very much.

CHAIRPERSON NICHOLS: Thank you.

Ms. Case.

MS. CASE: My name is Jennifer Case. I'm one of the founders of New Leaf Biofuel, a biodiesel refinery in San Diego.

Thank you for the opportunity to speak today. And thank you to staff and leadership who has spent

countless hours coming up with solutions that help lower greenhouse gases here in California.

I was working as one of California's many lawyers when AB 32 was signed. And don't hold that against me. But due to the groundbreaking legislation and a grant from this agency, the alternative fuels incentive program, my friends and I were able to come together and build our biodiesel refinery in San Diego in the disadvantaged community of Barrio Logan.

Our business plan has always focused on recycling a low value feedstock into an ultra low carbon fuel that we sell back to the community in blends up to and including B20. Our community scale model allows local fleets to reduce their carbon footprint and support a local business at a cost that is comparable to the petroleum diesel alternative.

I fully support the readoption of the low carbon fuel standard, and I look forward to continuing to work with this agency on the alternative diesel fuel regulation, specifically with regard to finding solutions that allow my business to continue its mission to work with my local community to improve air quality and public health. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Mr. Neal.

MR. NEAL: Thank you, Madam Chair and members of the Board. My name is Shelby Neal. I serve as Director of State Governmental Affairs for the National Biodiesel Board.

For those of you that may not know, the NBB is the national trade association for both the biodiesel and renewable hydrocarbon biodiesel industries. We added renewable diesel to our membership about a year and a half ago.

In order to be brief, I'll just confine my comments to one particular issue. Sometimes I find in a matter of when we have long protracted discussions and debates, the simple facts of the matter are lost or at least obscured. I think sometimes that's happened a little bit here with regard to fuel availability, which is really what I want to focus on.

So just a few verifiable facts about fuel availability on the diesel side. So you can go on U.S. EPA's website and check these out.

So when we look at what's happened in biodiesel and renewable diesel space in the U.S. the last couple of years, in the U.S. domestically, we produce 1.4 billion gallons of product. In 2013, we produce 1.5 billion gallons of product. That's a lot of product, considering especially ten years ago you were buying biodiesel by the

jar. Now we're at 1.5 billion gallons. If you look at the U.S. market, it's been 1.8 billion gallons the past two years. There was already a lot of biodiesel and renewable diesel in this country. California would only require a fraction of that.

But the real story is not production. The real story is capacity. Capacity -- this is registered, verifiable on U.S. EPA's website -- is over 3 billion gallons. That's 3 billion gallons of product in potentially California we require one-eighth of that.

So we're here today and we're affordable. If you look at pricing across the country, for the past three years, we have this data biodiesel has been 22 cents cheaper than petroleum at the wholesale level. So I think the story with fuel availability -- and I'll confine my comments to the diesel fuel side because that's our particular expertise, is a real positive one.

In the biodiesel industry, our motto from the beginning has always been local feedstock, local production, local markets. So the question is what's happening in California. Again, very positive story. I pulled our production data from last year so pre-LCFS, California really, with all due respect to our members, was not on the national radar screen on production. Now California ranks 13th out of 46 states in biodiesel

production. We're nearly in the top quartile. And we moved from the bottom quartile in a very short period of time.

Now, by 2018 and 2020 with these regulations based on our experience and other states, we would expect California to possibly enter into the top five of production.

So one final thing. Again, there has been a lot of -- I think there there is some areas of this regulation that are extremely complex. And it's necessary to engage in informed speculation. But this isn't one of them.

And I'll continue.

So if you look at the state of Illinois, Illinois has a very strong biodiesel use policy. Three quarters of the --

BOARD MEMBER BERG: If you could give us a concluding statement, that would be helpful.

MR. NEAL: Illinois has a biodiesel policy that's providing between a nine and ten percent GHG benefit. So there is already a state that on the diesel side is meeting the 2020 requirement here. There should be no need for speculation.

BOARD MEMBER BERG: Great. Thank you very much.

Russell Teall.

MR. TEALL: I was going to say good morning. I

guess it's not anymore.

My name is Russell Teall. I'm the President of Biodico. We're a sustainable biodiesel facility using anaerobic digestion, gasification, and solar. So 100 percent renewable.

I'm also the president of the California Biodiesel Alliance and have been on both advisory panels for the low carbon fuel standard. So I've watched this program evolve over time and with the trials and tribulations of the lawsuit.

Richard Corey and his staff should be commended for hazardous duty being in the line of fire, having to negotiate between the biofuels groups, the NGOs, the oil companies, et cetera. I think they've actually done an excellent job. And it goes all the way down through the staff level. The staff people that we've dealt with have been open, receptive, trying to operate on a factual basis. And, you know, nothing is perfect. But I think it's a good compromise.

Our particular facilities are being expanded as a result of the low carbon fuel standard. So we began in California in 2003 with the US Navy as part of a cooperative research development agreement. And the secretary of the Navy six years ago set a goal by the year 2020 of a 50 percent reduction in fossil fuel use. So

it's a very strong leadership position. That facility also happens to be or was until redistricting in 600 Pavely district.

So our other facility is in Henry Perea's district in the Central Valley in western Fresno County. That's a new facility. Construction is going on right now. That's slated to be a ten million gallon a year facility.

So I've been talking about biodiesel. But I think that it's going to take, as President Obama said, an all of the above approach. All the biofuels, electricity, hydrogen, fuel cells, renewable diesel, all the alcohols, ethanol, and advanced alcohols, those are all part of the fuel mix and part of the diversity. So I think that the low carbon fuel standard readoption process is setting the right message and the right tone at the right time to stimulate further market capabilities.

Thank you.

BOARD MEMBER BERG: Thank you. So everybody can check their time, we are at about a few minutes after noon. We're going to take our lunch break at 12:30. And that will go until 1:30. We'll probably get through the next eight speakers, if we kind of look at where you are on the list and we can kind of get lined up. And so that's what we can kind of expect for the next half hour

or so. Thank you.

Julia.

MS. LEVIN: Members of the Board, I'm Julia Levin with the Bioenergy Association of California. We represent more than 50 public agencies, local governments, and private companies that are converting organic waste to energy. And we strongly support the readoption of the low carbon fuel standard. We believe it is very much achieveable.

Organic waste alone in California, the organic part of the waste, livestock waste, agricultural waste, wastewater treatment facilities, together those facilities produce enough organic waste to generate two and a half billion gasoline gallons equivalents of very low carbon and sometimes carbon negative transportation fuels. Two and a half billion gasoline gallons equivalents, that's enough to replace three-quarters of all the diesel used by motor vehicles in California.

So in addition to meeting the low carbon fuel standard, we would provide enormous benefits to public health by reducing NOx and particulate matter and toxic air contaminants.

In order to achieve those benefits, California needs to continue to invest not just in a low carbon fuel standard, but specifically in natural gas vehicles and

natural gas infrastructure. Natural gas and biogas are inextricably linked. We use the same vehicles. We depend on much of the same infrastructure.

So we urge the Board not only to re-adopt the low carbon fuel standard, but to continue to invest in natural gas vehicles and the natural gas infrastructure that makes it possible to use biogas, the very lowest carbon transportation. Thank you.

MS. MENDOZA: Good afternoon, Jerilyn Lopez Mendoza representing the Southern California Gas Company.

I first of want to apologize for my expression today. I'm very stuffed up and my ears, I can't hear anything because of the flight. So I can't even hear my voice. So if I'm speaking really loud, I apologize.

So first of all, I want to begin my comments by saying Southern California Gas Company is very much in favor of this Resolution moving forward and the Board approving the readoption of the low carbon fuel standard. We believe it's the right way, one of the right ways to get us to the low carbon fuels in the state where we continue to be very supportive.

However -- you know there was going to be a however. We have two concerns moving forward. In terms of the implementation of the program between now and July, the final vote will be as well as beyond July and

implementing the program into the future.

First of all, we want to make sure and we want to emphasize to the Board and to staff that we would like the GREET model to be based on the best available data that we have available to all of us. Meaning, objective scientific analysis, data that's recent, that's from third parties, and from academics and folks who have a lot of expertise in the field with respect to methane leaks and with respect to natural gas and its efficacy within this framework.

Secondarily, we're also concerned about stakeholder engagement as we move forward. During the presentation in PowerPoint slides number 20 and 37, there were verbal references to engaging stakeholders in the process moving forward between now and July and then beyond July.

But in the next steps articulated by staff in slide number 39, there is no bullet point that specifically relates to stakeholder engagement, stakeholder dialogue. So it's not clear to those of us who are very invested in the process and invested in this program moving forward how can we most appropriately and formally engage with staff and get our concerns on the table before you and have it be part of the ongoing process to ensure that that scientific analysis is as

rigorous as possible. So we just want to make sure there is no confusion as it relates to public review and engagement.

And finally, we look forward to working with staff towards the continued success of this program. I believe over the past year that I've been working at the gas company we've built up some great relationship. There have been educational dialogues back and forth. And we're learning from each other in terms of staff, from ARB and staff from Southern California Gas. We like to continue to move that forward.

And just my final point I just wanted to appreciate all the time taken by Board members and staff in the last few weeks, particularly in terms of engaging in a meaningful discussion with us about the program. Thank you very much.

CHAIRPERSON NICHOLS: Thank you. Matthew Plummer.

MR. PLUMMER: Matthew Plummer, Pacific Gas and Electric Company.

First, PG&E would like to express its support for the low carbon fuel standard and encourage the Board to move forward with readoption.

Like my colleague at So Cal Gas, we have a number of technical issues we'll need to continue to work with

staff on between now and the Board vote. We also like to thank staff and thank the Board for their continued willingness to meet with stakeholders. We look forward to many more constructive conversations in the months to come. Thank you.

BOARD MEMBER BERG: Thank you.

MR. WRIGHT: Good afternoon. I'm Curtis Wright. I manage the biodiesel operations Imperial Western Products. We're a biodiesel plant located in Coachella, California. We've been in operation since 2001. Over this time, we made over 55 million gallons of biodiesel, all from used cooking oil we collect in the area. What's interesting is that since the introduction of the low carbon fuel standard and the last four years we made more than half of that 55 million gallons. It's given our business a lot more certainty and more of a market out there. So we strongly support readoption of the low carbon fuel standard. That will help us to continue to grow, add jobs, and provide clean, low carbon biodiesel to Californians. Thank you.

BOARD MEMBER BERG: Thank you very much, Mr. Wright.

John O'Donnell.

MR. O'DONNELL: Good afternoon. My name is John O'Donnell with the Glass Point Solar. We are a leading

provider of solar steam generators for the oil industry.

And I'm here to speak in support of the modifications and the specifically innovative crude provisions of the low carbon fuel standard.

The use of solar energy represents the largest lowest cost and lowest risk approach to reducing the carbon intensity of petroleum fuels produced here in California.

And as part of our written comments, we submitted an economic impact study that was carried out for us recently by ICF, which found that if the identified market opportunity here in California, if those solar projects were built, we would be delivering over their construction and operations some 45,000 cumulative job years and some five billion dollars of increased economic activity, increased gross state product here in California. We believe that the modifications in streamlining and simplification to the innovative crude provisions that are included in the current package set the stage so that our contribution can be brought to reality. And we look forward.

BOARD MEMBER BERG: Thank you very much.

Ross Nakasone.

MR. NAKASONE: Happy new year to every one. My name is Ross Nakasone with the Blue Green Alliance. We're

a national coalition of labor and environmental groups including the United Steal Workers and Natural Resource Defense Council.

Our mission is to really try to encourage folks to address their environmental challenges in ways that create and maintain sustainable jobs. To that end, Blue Green Alliance supports the readoption of the low carbon fuel standard.

I'd like to thank Richard Corey and the rest of CARB staff for their hard work. Over the past three years, steal workers, NRDC, and Blue Green Alliance have worked together to provide recommendations to CARB staff particularly on program flexibility that encourages investments in refinery projects that reduce GHG emissions.

Credits for refinery improvements represent, we believe, a significant opportunity to spur additional investments that can improve environmental performance of refineries and create secure refinery jobs while reducing the carbon intensity transportation fuels, and of course, fostering additional benefits such as reductions in criteria pollution.

We appreciate staff willingness to hear our ideas and to incorporate them. Steal workers, NRDG, BGA, believe the improvements to the low carbon fuel standard

further our shared vision of better jobs and a better environment. With that, BG urges you to approve this Resolution.

MR. UNNASCH: I'm Stefan Unnasch with Life Cycle Associates. Thank you for the opportunity to speak.

I've been involved in fuel LCA issues for the ARB since 1994, including presenting on the environmental impact of ZEVs in 2000 and developing the California GREET model in 2009.

Since that time, the ARB staff has come a long way. They've learned, you know, virtually every aspect of fuel LCA. And I would like to commend their efforts and the whole process of understanding biofuels and petroleum fuels has really moved along. And the LCFS is doing a good job.

There are some areas of improvement. I submitted some comments. One of them has to do with the effect of the nitrogen cycle on biofuels. And the other has to do with marginal electricity. Basically, the idea with electricity is we're getting the cleanest electricity into the electric vehicles and into the hydrogen electrolysis in California. There is no nuclear. There is no whole power that's going into those. If you run an electric car, you're not making a coal power plant go on. You're not making a nuclear power plant go on either. What's on

the margin is, you know, fairly well understood. And it's important for several fuel pathways. So those comments should be considered.

So on balance, you know, we've gone through a lot in the past seven years. And I think we understand a lot more about indirect land use, a lot about all of the fuel pathways, and encourage the ARB Board to readopt the LCFS this summer.

CHAIRPERSON NICHOLS: Thank you very much.

Chuck White.

MR. WHITE: Thank you very much, Chairman and members of the Board.

Chuck White representing Waste Management. Waste Management is a strong supporter of the readoption of the low carbon fuel standard. Waste Management provides comprehensive recycling and solid waste services throughout California and the U.S. And you're probably familiar with my big green heavy duty refuse and recycling trucks you see throughout California. One half that fleet in California is natural gas. In fact, the vast majority of that natural gas fleet is being fueled by renewable natural gas. And a large part of that is being produced -- as far as we know, the only very low carbon fuel production facility here in California that produces LNG or CNG. That's our Altamont landfill, producing

13,000 gallons a day.

Waste Management can build a lot more of these facilities, both in California and fuel is brought to California if we had certainty and security of the price we need to repay the capital cost and operational costs of these ventures.

Unfortunately, the political and legal challenge that the low carbon fuel standard has faced over the last years has created the level of uncertainty that really has deferred us from making further developments until we can see a pathway to get a return on our investments for these. We're anxious to do so and strengthen and readopt a low carbon fuel standard will certainly do that.

We have been unable to get long-term contracts for the production of credits, both green credits and LCFS credits to be able to cover our cost. Without that degree of certainty, we've been unable to do that.

We first saw the LCFS credit for $10 and then $80 a ton and now back down to about $25. We do produce a lot of fuel for California, well less than $200 per LCFS credit, I can assure you of that.

The uncertainty is, like I said, also due to the political and legal uncertainty. But also has to do with the uncertainty over the CI values. I'm glad staff is looking at that during the 15-day re-notice period, the CI

adjustments. That's created a lot of nervousness on the natural gas sector. We're not opposed to the right number being used for the carbon intensity renewable natural gas. It's just making sure it is the right number and making sure it's based upon best science available to ensure that is being supported.

In summary, it's most important today that you readopt the low carbon fuel standard. I originally thought I would be arguing for a floor. I'd like to have a floor on the price to complement the ceiling on the price at 200, but get the thing readopted. Get it functioning, back on track again. That is by far and away the most important part.

And again, making sure that if you change the CI number, particularly if you increase the CI number on a fuel, you make sure it's the right CI number that's well based on fact and size. Thank you very much.

CHAIRPERSON NICHOLS: Thank you.

Mr. Darlington.

MR. DARLINGTON: Thank you. Good afternoon. My name is Tom Darlington. I'm President of Air Improvement Resource, consulting firm providing engineering and consulting services in the area of alternative fuels.

I'm here to address the modeling indirect land use changes. As indicated, I'm here on behalf of the

POET, which operates 26 corn ethanol bio-refineries in the United States and is a pioneer in the effort to bring cellulosic biofuel to the market.

POET has participated in the rulemaking process on the proposal being considered today and concurs with Growth Energy's comments that were submitted. Our company has participated in all of the ARB workshops on land use emissions and the GREET life cycle model and has provided detailed written comments.

As indicated in those comments, we do not agree with the land use change emissions factor that the staff is proposing for corn starch ethanol.

The main point I'd like to make today is that the staff has deferred, we feel, too many significant issues raised in the technical literature and by stakeholders since 2009 for future research. Many of these issues were identified several years ago.

The table on the screen shows the status of some of the items that we have recommended. And as you can see, some of these items have been deferred for future research. The most serious of these is the emission of the multi-cropping effect, but others are important as well. We and others, including the expert working group, recommended that ARB include the effects of double and multi-cropping, which refers to the common practices in

certain regions of harvesting more than one crop on the same land per year.

Multi-cropping uses existing crop land more intensively, thereby reducing the need for land conversions from both forest and pasture to crops. The economic model used by ARB does not include double or multi-cropping. This is a serious shortcoming that leads to higher land use emissions from all feed stocks.

The omission of idle and fowl land is also a serious concern in this model. The importance of including multi-cropping was clearly illustrated by a study recently released by Professor Bill Babcock of Iowa State University. I'll quote a little section, but, "The contribution of this study is to confirm that the primary land use change response of the world's farm is from 2004 to '12 has been to use available land resources more efficiently than to expand the amount of land brought into production. This finding has not been recognized by regulators who calculate indirect land use."

So in sum, if the land use emissions of corn ethanol are over-estimated, then the carbon intensity of corn ethanol is too high, leading to a reduction in corn ethanol in California without a accompanying greenhouse gas reduction. This is not only a problem for POET. It is a problem for California because it leads to

unnecessary fuel shuffling and a loss of greenhouse gas emission benefits. Thank you, again.

CHAIRPERSON NICHOLS: Thank you for wrapping up.

Jessie David. And then Perry Simpson and Todd Campbell. And then we're going to take our lunch break.

MR. DAVID: Thank you.

Again, my name is Jessie David. I'm an economist and partner at Edgeworth Economics Consulting Firm with offices here in California. I received my Ph.D. from Stanford, and I specialize in environmental economics and public finance. I've been doing regulatory evaluation for about 18 years.

I was retained by Growth Energy, an association representing producers and supporters of alternative fuels to analyze the impact of the LCFS on ethanol producers. I'd like to summarize my analysis, which is included as an appendix to Energy's extensive written comments.

I was asked to consider what the analysis in the Initial Statement of Reasons, the ISOR, says regarding the impact of the new program to Midwestern corn-based ethanol in California's motor fuel mix. The ISOR presents an illustrative compliance scenario we heard about today, which is CARB staff's projection of one potential pattern of compliance that we meet the proposed standard.

Staff projects a reduction in corn ethanol

consumed in California by almost half by 2020, with most of that being replaced by cane ethanol from Brazil.

Staff also assumes that the credit price would be $100 in 2016 through 2020. This value presumably would provide the impetus for switching from a less expensive to what's currently more expensive type of ethanol that is currently the primary choice of fuel marketers in California.

So to determine whether credit price of $100 would, in fact, cause marketers to switch in this manner, I analyze the total delivered cost of both types of fuels and their various assumptions. I use data on current projected fuel prices, REN values, and freight rates from public sources. And I supplement it with information about freight patterns and costs. I use CARB's projections of the future average CI level for those fuels.

I calculated based on currently available forecasts which shows a narrowing of the price spread between corn and cane ethanol in 2016, a credit price of about $36 would lead to a switch from corn ethanol with CI ratings in the low 90s to cane ethanol with a CI rating of 72. A credit price of around $77 would cause a switch from corn with CI ratings in the low 80s to cane ethanol.

Moreover, if cane ethanol can attain the average

ratings predicted by CARB, then the switch to cane from corn would occur at even lower credit prices. For example, CARB projects Brazilian cane ethanol with an average CI rating of 40 by 2016. At this level, a credit price of only $23 would result in a switch from corn to cane, which CARB projects would have a CI rating of 70. That is corn as of 2016.

CARB's illustrative compliance scenario indicating a substantial decline in the use of corn ethanol with replace it. Cane ethanol is therefore not only plausible, but likely, if assuming the availability of sufficient Brazilian ethanol is rejected by CARB. This is true, even assuming credit prices well below $100.

In sum, based on the current ratings predicted by the ISOR, the future midwest corn ethanol is at risk in California. Even ratings as low as 70 would be at risk under these conditions. And if the industry can't achieve those ratings, the impact could be more severe. Thank you.

CHAIRPERSON NICHOLS: Mr. Simpson.

MR. SIMPSON: Hi. I'm Harry Simpson from Renewable Energy. I am the President. And we, last year, had the distinction of being the largest biodiesel producer in California.

So, first, I want to thank the ARB staff and

leadership for their consistent engagement over the last many years and really reaching out to all stakeholders to get that input to craft the proposed regs that we have before us today.

And I also want to thank them on behalf of our employees here in California and the local community that we serve in the valley for their commitment to a more sustainable and broadly beneficial future for transportation fuels in California.

Secondly, I'd like to say that LCFS is working. It has been working as intended as originally envisioned. The credit generation thus far has been consistent with ARB staff projections. Credit generation through Q3 of 2014 was nearly four million metric tons of excess credits, which was consistent with the original projections once the compliance requirements froze one percent.

We strongly urge the Board to accept the staff recommendations to stay with the original time line of a ten percent reduction in 2020. We believe that this is fully achieveable and echo the comments that you've heard from various industry groups and individual companies concerning different types of alternative fuels, be it biodiesels, renewable diesel, biogas, electric vehicles, and I'm sure some others that I haven't come up with yet.

We believe this is critical to send a strong market signal. Indeed, the only reason why we chose o build this plant this California back in 2008 and '09 was because of LCFS. If it wasn't for LCFS, we wouldn't be here and I wouldn't be speaking today.

Having the certainty of this time line will inspire additional investment on a broadly macro level if you will, but also on an individual company level. In the case of a company like ours, it may inspire additional investment in the form of expansion or taking on new projects to reduce our CI, to take advantage of lower CI feed stocks, or to engage in the development of renewable energy sources to a few more plants, such as biogas from a co-gen turbine system.

I urge the Board to consider ongoing carbon reductions beyond 2020 to keep the momentum moving forward and send those market signals as well. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Mr. Campbell.

MR. CAMPBELL: Good afternoon, Madam Chair and members of the Board.

Todd Campbell, Vice President of Public Policy and Regulatory Affairs for Clean Energy. Clean Energy has been an original supporter of AB 32 and the low carbon fuel standard. And we are proud to remain in strong

support of the rule's re-adoption. The fuel neutrality of the standard is perhaps the most attractive to Clean Energy because it encourages innovation of fuels and processes.

And Clean Energy, as you know, has been a leader in developing not just natural gas in the conventional sense, but also renewable natural gas on a broad scale. So much so that when you pull up to our station, any station within California and fill your natural gas vehicle up, it is being fueled with renewable natural gas and ultra low carbon fuel. None of this, of course, would be possible without your collective leadership, staff's and Board's. And so I want to congratulate you on that.

In an effort to support the Air Resources Board further, clean energy has been actively engaged in supporting other low carbon fuel markets in Oregon and Washington, and we believe those markets will succeed as well.

However, it is critical that we get the carbon intensity values of natural gas and renewable natural gas correct. We have been working extensively with staff over the last few months. We believe that we've achieved some success with the staff. We do believe that we need to continue to work with staff.

I want to acknowledge the several mentionings of

staff during the presentation that they recognize that there is a continuing effort to or a need to continue to work on these CI values. We at Clean Energy significantly appreciate that ability or that willingness to continue to work with us before the rule is finally adopted.

I also like to say that just so the Board understands why we care so much about this, we have ICF International and GNA working with us closely on trying to help ARB staff get to the right number. And for every gram per megajoule that is added from the original GREET model showing our carbon intensity, using a medium value or base case scenario of a credit value of $50, it could mean a 15 to $58 million potential economic benefit or loss for our industry. And if we're going to help achieve 2020 values -- and I suspect this agency is going to look for 2030, 2040, 2050 -- we need to be able to have certainty, and we need to be able to continue investing in ultra low carbon fuels that will get us to where we need to be to prevent climate change. Thank you.

BOARD MEMBER SPERLING: One tiny question.

What percentage of your gas that you're supplying to vehicles is biomethane renewable gas?

MR. CAMPBELL: In California and all our public stations it's 100 percent.

BOARD MEMBER SPERLING: What about going forward?

MR. CAMPBELL: In other words, if you looked at other fuels that use blends, we can also in future years as you go further up in carbon intensity reductions, you know, the blend probably will go down. But we will do our best to maintain 100 percent, of course.

But as Julia mentioned earlier, this is not just a 20 or 40 million gallon market where just for clean energy delivery alone. It's several billion gallons potentially, if not more. And I think staff -- I think we're helping staff become believers in renewable natural gas as a transportation fuel, because in the past, if you looked at the proposed scenarios, you wouldn't see very much renewable natural gas in there. But you're starting to see a significant slice of the pie in those forecasted scenarios.

BOARD MEMBER SPERLING: I like it. Thank you.

CHAIRPERSON NICHOLS: On that note, we're going to take a lunch break. We're going to try to keep it to an hour. The Board will be in executive session during that period. And we'll see you all back here at 1:30. Thanks.

(Whereupon a lunch recess was taken at 12:32 p.m.)

CHAIRPERSON NICHOLS: Welcome back, everybody. Before I forget, if you didn't sign up on the list and

you've suddenly been inspired with a desire to speak to us on this issue, would you please sign up with the Clerk over here, because we would like to close off the list just so we can know that we actually could close off the hearing on this item. We do have a couple of Board members who have to leave and who really want to be able to speak to this issue and to participate in the Resolution.

CHIEF COUNSEL PETER: Madam Chair, you need to report on the closed session.

CHAIRPERSON NICHOLS: I will. We had a closed session. Thank you. And it was Board members only. No staff were included. The topic was a personnel review. It was a report by two Board members on the review they had been asked to do. They reported successfully. No action was taken. Thank you.

Okay. Let's continue with Jonathan Lewis.

MR. LEWIS: Thank you and good afternoon. My name is Jonathan Lewis. I'm Senior Counsel at Clean Air Task Force. CATF is a nonprofit organization that works to help safeguard against the impacts of climate change by catalyzing the rapid global development and deployment of low carbon energy and technologies. CATF has submitted written comments and made several points. First and foremost, that ARB should adopt the LCFS through 2020.

Achieving compliance with the 2020 target would be difficult. The LCFS remains the most promising policy available nationwide for reducing climate impacts in the transportation sector.

The issue that I'd like to draw the Board's attention to today has to do with the model relationship between corn ethanol production, food consumption, and net CO2 emissions.

The key point I hope to make is that by developing the relevant data and determining which data sets to use and which to exclude in the life cycle model are subjective exercises, as are processes of choosing a programming relational assumptions that drives the model. Viewed in this context, the proposal to reduce corn ethanol to indirect land use change or ILUC score can be more appropriately understood as the product of subjective process, one that reflects the current availability of certain data analyses that would contribute to a lower ILUC score, but fails to account for a host of counter-vailing factors that ARB knows are significant but has not yet modeled.

An important way in which ILA's estimates are the product of subjective decisions and not just objective calculations relates to the treatment of reductions in food consumption associated with the policy and reduced

demand for biofuels. As explained in a recently published paper that looked at ILUC analysis and used by ARB, ILUC emissions estimates depend on various modeling choices such as whether reduction of food consumption resulting from biofuels expansion is treated as climate benefit. ARB currently chooses to count GHG reductions that result from reduced food consumption when analyzing the life cycle emissions of biofuels. But that again is a subjective decision.

Several studies indicate that if ARB instead chose to assume society woul limt the extent to which food consumption would decline, ARB estimates corn ethanol ILUC emissions would increase substantially as detailed in our written comments.

The highly subjective treatment of reduced food consumptions reinforces the point that ARB is not obligated to reduce the ILUC score for corn ethanol on the basis of the most recent highly and complete modeling results.

CATF urges the Board to recognize these limitations as well as the necessary role that it and ARB staff play in interpreting and acting upon the modeling results. The Board should exercises its best judgement in light of the overarching policy objectives of the LCFS and CATF, which CATF understands to be a meaningful reduction

in GHG emissions from the transportation sector. Because corn ethanol's life cycle GHG emission reductions, which are very modest to begin with, depend on an assumption of reduced food consumption in developing countries and because increased reliance in corn ethanol would frustrate the development of more innovative and effective compliance options, the proposal to reduce ILUC score for corn ethanol undermines the objectives of the LCFS.

Accordingly, the CATF urges the Board to table any proposal to reduce the carbon intensity value ARB uses for corn ethanol.

Thank you for the opportunity to comment on this critically important policy.

CHAIRPERSON NICHOLS: Thank you.

MS. PHILLIPS: Good afternoon, Madam Chairman, fellow members of the Board, ladies and gentlemen. It's a pleasure to be here today speaking in support of the low carbon fuel standard.

I represent the Brazilian Sugarcane Industry Association, Unica, and my members are the largest ethanol producers in Brazil. And we represent about 50 percent of all the ethanol production in the country.

Today, sugarcane ethanol is a modest but important role in supplying the U.S. in general and California in particular with low carbon clean fuel. From

2012 to 2014, Brazilian sugarcane ethanol supplied 13 percent of the total U.S. supply in spite of use.

As the low carbon fuel standard readoption process takes place over 2015, we believe sugarcane ethanol is uniquely positioned to help reduce transportation fuel emissions. And that's because CARB studies considered sugarcane ethanol the best performing low CARB liquid fuel commercially available today to contribute to the program. This distinction is important as CARB considers more stringent life cycle carbon intensity rules for transportation fuel, which are projected by CARB to increase sugarcane ethanol use to 400 million gallons per year by 2020.

California can rely on Brazilian sugarcane ethanol. That's because for the past ten years we've been making the necessary investments to increase supply in the country. We know by the profile of our companies and the companies invested in the sector that Brazil can quickly ramp up production to meet higher market demand. This is very important as Brazil's expected to move into higher blend as early as next month. We know that there is capacity in Brazil to supply California with the volumes that CARB has projected. And we know we can do this in a very sustainable way.

I have submitted comments -- written comments on

two technical items that I think needs a little bit of reveal from the staff before you can readopt this. And I just wanted to conclude with these points. We know that electricity cogeneration by sugarcane mills in Brazil are replacing fossil fuel sources of power in the country. We urge CARB staff to factor in this marginal displacement rather than using an average electricity mix for Brazil. At the very least, we ask CARB to update the EIA electricity production numbers for Brazil that right now are for 2011. And we have more updated numbers that we have shared with staff that reflects the sharp decrease in hydroelectricity power in Brazil. Another point is --

CHAIRPERSON NICHOLS: Please finish up.

MS. PHILLIPS: Sure. We are very glad to see that ILUC reduction for cane ethanol, but would love to ask the staff to capture the double cropping in Brazil. It's been a pleasure for us to contribute to CARB and with the staff for these past years. We think the low carbon fuel standard is a model to be emulated by the rest of the country. And we ask you to readopt it. Thank you.

MR. KOEHLER: Thank you. My name is Tom Koehler with Pacific Ethanol. I'm representing today the California low carbon ethanol producers, all of whom are producing in the Central Valley over $500 million worth of investment for plants, 200 million gallons. We have been

from day one and continue to be big supporters of the LCFS, and we urge the readoption today. We also are supporting a further signal beyond 2020 and would urge the Board to do that as well.

We have been part of a larger coalition of alternative fuel providers and a lot of the providers other than ethanol you're hearing from today. And we're proud to be with them all because we realize it's going to take all of the fuels to succeed to their fullest to meet the goals, not only the low carbon standard, but the Governor's goals as well.

I would like to flag the ILUC issue, the gentleman just spoke about it. There is -- since the staff proposal came out, there is new data which is actually real world data, so not dependent upon one person's assumptions, of actual land use change that has occurred worldwide over the last ten years. And Wally Tiner from Purdue and GTAP, Son Ye from U.C. Davis are embarking on a study to calibrate the GTAP model, back cast it. And I would urge the Board to ask for the results of that to come back. It's too late for the 15-day notice. But when that study is done, I would urge the Board to ask to review the ILUC.

CHAIRPERSON NICHOLS: Thank you.

MS. HOLMES-GEN: Good afternoon. I'm Bonnie

Holmes-Gen, Senior Director, Air Quality and Climate Change for the American Lung Association in California.

And on behalf of the American Lung Association in California and health and medical groups throughout the state, I urge your readoption of the low carbon fuel standard as soon as you can vote on it. Since its original adoption in 2009, public health and medical groups and our organization have supported the LCFS as a critical component of California's visionary clean air and climate strategy. And we see the LCFS as a critical tool to help Californians kick their addiction to petroleum fuels and transition to a cleaner future. The LCFS is bringing real and measurable health benefits a long way.

Our research has evaluated benefits from the tons of pollution reduced through the low carbon fuel standard and fuels under the cap and found over eight billion in avoided health costs by 2025, including over 800 avoided death and thousands of avoided asthma attacks and many other avoided health emergencies, as you can see here. And this is just a down payment on the tremendous benefits to come.

This version of the LCFS before you has substantial improvements from the earlier regulation, including expanded electric transportation credits and their refinery investment provisions that will help to

accelerate clean fuels progress to while protecting community health. And we are pleased to have over 30 health and medical organizations that are signed onto the letter that you've received, including the American Cancer Society, Cancer Action Network, Blue Shield of California, California Thoracic Society, Dignity Health, American Academy of Pediatrics, and many others. Our groups stand behind the LCFS as a vital and proven strategy that's transforming our transportation here and being pursued now in other western states.

And as we go forward, we know there will be additional improvements. One area we have flagged is the need to update the biorefineries guidance document to incorporate updated tools that evaluate community impacts. And we look forward also to setting the post-2020 targets.

I would like to close with a brief quote from Dr. Perdiga who's a physician and participant in our Doctor's for Climate Health Campaign picture here and would like to note we greatly appreciate the engagement of Dr. Sherriffs and Dr. Balmes also in this campaign. And here's Dr. Perdiga's quote. "We have no control over the air we breathe. But we do have a say in what pollutes it. My patients in the San Joaquin Valley suffer the side effects of pollution every day, whether they live in cities or rural areas. They have the most to lose in we don't

continue pushing for cleaner air. Their health is at stake and we must do more. That is in I support California taking the lead in reducing carbon pollution from transportation fuels."

Thank you again. And as always, we look forward to working with you.

CHAIRPERSON NICHOLS: Great. Thank you.

Tim Carmichael.

MR. CARMICHAEL: Good afternoon. At the risk of another zinger from the Chair, I want to stand in solidarity with all the Tims that are going to testify today.

More seriously, Tim Carmichael with the California Natural Gas Vehicle Coalition. We are here to support the program. And I want to encourage all of you to feel empowered to support this. And one of the measures that leads me to that comment is the breadth of the portfolio of alternative fuels that you are not speaking here today, but engaged in the market already.

And you know, this is a good program. ARB has programs that tend to go up and down based on one technology's success or not. That is not the case here. You have a lot going in the right direction with this program. And that gives you all the confidence to continue to support it.

For the natural gas industry specifically, I just want to mention a couple of things. We've made good progress over the last several months working with the staff on some technical issues related to the model and carbon intensities. Those have been referred to. I want to thank Richard Corey for his personal engagement on these issues and the whole LCFS team's hard work. It's not easy stuff. We are talking about technical calculations and a lot of moving pieces. But as I said, we've made a lot of progress.

We have a handful of issues we haven't resolved yet. The staff have referred to those. They mentioned they're committed to working with us to resolve those.

In your resolution package, there is a reference to this as an attachment, a suggestion that you add a bullet that relates to these on going conversations and supports the staff continuing to have those conversations.

We respectfully ask that you include that in your Resolution today as part of your direction of staff. I think that request is consistent with what the staff shared earlier. We just think it's so important to get it right for the reasons that have been mentioned, the financial impacts within the state, as well as the impacts that our success in California is going to have on other states.

One quick detail on that. You have literally dozens of people that are working on this issue in California. Many other states have one or two people assigned to this program. So California getting it right is going to -- just that much more important. So those other states can rely on our technical work.

Thank you very much. Appreciate your time.

CHAIRPERSON NICHOLS: Thank you. Tim is actually one of my favorite names.

David Cox.

MR. COX: Thank you, Chairman Nichols, Board members, staff.

My name is David Cox. I'm the Director of Operations for the Coalition for Renewable Natural Gas.

I'd like to begin by complimenting Mr. Corey on his leadership. And at the risk of leaving someone out specifically, I just want to publicly thank and knowledge Mr. Vergara, Mr. Kitowski, and Mr. Imgrahm, and your very capable team in the front row. You guys have really done a great job.

The Renewable Natural Gas Coalition advocates for advanced applications of renewable natural gas derived from cellulosic waste sources. We do this so present and future generations have access to domestic, renewable clean fuel and energy supply.

We represent the leading renewable natural gas companies and organizations who collectively they produce and distribute more than 90 percent of the transportation fuel from renewable natural gas delivered in North America.

Ms. Sideco mentioned earlier that R&G volumes have grown about 70 percent since LCFS was first adopted. This is tremendous growth for our economy and for our environment. We also like this particulate stat because it also correlates with the founding coalition and our respective growth.

I'd like to focus my comments today on the GREET cost containment provisions on a going-forward basis. I think we have a come a long way. I'll just echo everything that Mr. Carmichael just mentioned.

But specifically, the importance of having a sound process to deal with these, because I think they are the two issues that will most impact renewable natural gas on a going-forward basis.

And as to the GREET model, I'm certain by now you're familiar with how highly we consider the stakes of the GREET model. We appreciate your commitment to fuel neutrality and also to ensuring the GREET is driven by sound data and ask for your continued commitment on those points.

As to cost containment, staff has proposed a $200 cap on credit prices. We think that should absolutely be paired with a provision and cost containment on the low end in the event that credit prices go down.

And so we thank you. We have submitted comments and talked with staff throughout the workshop process on specifics on how to do that. And we just encourage you to continue to address cost containment on a going-forward basis. That will conclude my comments.

CHAIRPERSON NICHOLS: Thank you.

MR. BARBOSE: Good afternoon. My name is Jason Barbose. I'm with the Union of Concerned Scientists. And on behalf of our 73,000 supporters in California, speaking in support of moving forward with the readoption process for low carbon fuel standard.

About a year ago, more than 150 California climate scientists and economists sent a letter to Governor Brown and the Legislature urging the state continue to be a leader in addressing climate change and to adopt 2030 carbon emissions targets that put the state on a path to meeting our 2050 goal of 80 percent reductions.

And in that letter, the researchers also highlighted the need for additional policies that promote low carbon fuels and cleaner transportation. And with

that back drop in mind, we view the LCFS as a critical element of the State's approach to reducing greenhouse gas emissions while continuing to thrive economically.

We also view it as an important part of Governor Brown's new goal to cut petroleum use in half by 2030, which echoes my organization's half the oil plant of the United States.

I'd like to note three important technical changes that are being proposed that UCS supports.

One is the update to the life cycle analysis that's been based on the best available science.

The second is the innovative crude and refinery provisions that will encourage the oil industry to reduce emissions from its own supply chain.

And the third is the cost containment mechanism that will maintain a stable investment plan for low carbon fuel production while ensuring that any unforeseen delays would not destabilize the policy of California consumers.

UCS has been performing analysis and providing technical feedback on the LCFS since its inception. We are confident the diverse sources of the low carbon fuel are available to achieve the ten percent carbon intensity target by 2020.

Earlier the month, we released a study on LCFS compliance from the consulting form Provoto that we

co-commissioned with NRDS and EDF, and that study finds first and foremost that compliance, is indeed, feasible through 2020 and beyond. The study also demonstrates that in order to ensure investment in the cleanest fuels, it is important as well that the State establish regulatory stability out beyond 2020.

By maintaining a stable science-based policy framework that recognizes that cleaner rules are indeed more valuable than dirtier fuels in conjunction with similar policies being adopted or pursued in our neighboring states, the LCFS will create a large stable and steadily growing market for clean fuesl, providing investment and innovation and bring down the cost of cleaner alternatives.

And for those reasons, we support moving forward with the readoption process. Thank you.

CHAIRPERSON NICHOLS: Thank you.

MS. MORTENSON: Hello, Chairman Nichols and members of the Board. I'm Lisa Mortenson with Community Fuels. And I'm so excited to be here today and commenting on the low carbon fuel standard.

If you're not familiar with Community Fuels, we produce advanced biofuels at our refinery at the Port of Stockton. Our fuel is primarily sold to major oil companies and refineries for blending with petroleum.

This is exciting because each gallon of our fuel that's blended with petroleum is displacing diesel fuel and is increasing the volumes of clean fuel being used in California. And I hope it's of no surprise to you when I say that petroleum companies do not voluntarily purchase our fuel since our fuel is displacing a portion of the product that they produce.

And it really underscores the importance of the low carbon fuel standard and programs similar to this. I think some people who don't participate in the market each and every day like Community Fuels does forget that, first on a positive note, we leverage the existing diesel infrastructure by selling our fuel to the petroleum industry. But second, the petroleum industry only purchases our fuel because it enables them to meet multiple compliance obligations. So it is so important -- and I say this strongly and passionately -- it is so important that we have regulations like the low carbon fuel standard to force the existing infrastructure to incorporate higher volumes of clean fuel.

As a California-based business, we need strong and supportive and consistent regulations. When we built our biorefinery, our company was started in 2004 and the refinery was built in 2007 when that construction was complete. We needed a long-term trajectory for planning

and to be able to finance the project. We can't work with one, two, three, or even five-year time frames for planning.

So not only do we support the readoption of the low carbon fuel standard, we encourage you to look far beyond 2020 and let's be ambitious. Let's seize the opportunity to get really aggressive targets that change the way we fuel vehicles in California. Our U.S. biodiesel industry is three billion gallons strong. We have three billion gallons of existing infrastructure. Our industry is ready to deliver. We are ready to deliver high volumes of low carbon fuel to California. So again, we strongly support the readoption, and I hope that we go further.

CHAIRPERSON NICHOLS: Great. Thank you.

I'm making an announcement we're about to close off the list of witnesses. We've got 50 people, and we're now at number 36. And I think we probably covered pretty much or will have covered pretty much every topic by then. Just so you know, we're coming to the end of the list. Okay.

MR. GERSHEN: My name is Joe Gershen. I'm a 15-year biodiesel veteran. Also Vice Chair of the California Biodiesel Alliance.

I'd like to thank ARB Board and staff for all

your hard work on these issues, which are vitally important to Californians. I'm very supportive of the readoption of the LCFS. And I commend you on inspiring other low carbon initiatives on the west coast and around North America.

As I've mentioned, I spent nearly 15 years in the California biodiesel industry. And I've been committed to education, fleet transition, and biodiesel acceptance and implementation. I've watched this industry grow from a fledgling idea of a few pioneering environmentalists scientists, engineers into a robust and growing industry providing hundreds of high paying green California jobs in some of the most disadvantaged communities in the state.

Today, the California biodiesel industry is capable of reducing over 600,000 metric tons of carbon emissions, which is also equivalent to taking about 140,000 cars off California roads. These metrics take on important and measureable meaning in the context of the low carbon fuel standard. So thank you.

This ground-breaking and critical policy demonstrates California's commitment to environmental and energy sustainability and simultaneously sends a strong and stable signal to business, which encourages investment and innovation, which will help achieve further carbon reduction goals. Thank you again.

I'm confident that working together with ARB, the California biodiesel industry can build on our successes. Last year, about 16 percent of all LCFS credits were generated by biodiesel industry, which also contributed about $350 million to California economy.

We look forward to contributing over even more to reducing carbon emissions, displacing petroleum usage, lowering emissions, and creating good high-paying green jobs somewhat characteristics of the California's most disadvantaged communities. Thank very much.

CHAIRPERSON NICHOLS: Thank you.

MR. MURPHY: My name is Colin Murphy. I'm a Policy Advocate for Next Gen Climate America. Thank you to the Board for the opportunity to speak.

In recognition of the long list, I'm going to make most of my comments in one sentence summaries. We support readoption of the low carbon fuel standard. We support the cost containment mechanism. We think there probably should be a price floor to go with the price ceiling.

On one other subject, I need a little more depth. We think on the subject of carbon intensities, there needs to be a regular and systematic mechanism for review of the carbon intensity numbers. This recognizes the developing nature of some of the science behind things, particularly

biofuels in areas like indirect land use change and oil sequestration. In the written comments we submitted, we gave you some research regarding oil carbon. We recognize the science is still open on this and there needs to be a balance between giving a target to producers but also recognizing that understanding may change over time. And we think that's such a balance can be achieved through a periodic review. Thank you for your time.

CHAIRPERSON NICHOLS: Thank you.

Susan Frank.

MS. FRANK: Thank you, Madam Chair and Board members.

I'm Susan Frank, Director of the California Business Alliance for a Clean Economy. I'm here actually just to reference a letter that was submitted on the record this week with a few numbers attached. There were 98 signatories to this letter. If you take a look, you'll see the diversity of signors from all sectors of the state from business and faith and labor and environmental groups, et cetera. At least half of the speakers speaking today have signed the letter. So I will not read the letter. There are at least four people named Tim on the letter. So that should count, too.

Really, I just wanted to express the strong support that you have across the state of California and

really across the region for what the action you're going to be taking today and over the next several months. And really proud to be able to be a signor to the letter. So thank you very much.

CHAIRPERSON NICHOLS: Thank you.

MR. MUI: Good afternoon, members of the Board, Chairman Nichols.

I want to thank you for the opportunity to speak on behalf of Natural Resources Defense Counsel. First off, I do want to wish you a happy Chinese New Years today, a Lunar New Years, the year of the goat, which is an auspicious year, one that is meant to be filled with prosperity and promise. So I do think it is quite fitting that today we are hearing about the proposal to readopt the low carbon fuel standard.

While I don't have red envelopes or dim sum for you, what is impressive to me as a clean fuels and vehicles scientist is that the LCFS standard is already working today, despite the speed bumps and the barriers that have been laid down before it to slow it down. We've now seen ten million tons of reductions by the program, the equivalent of taking two million cars and trucks off the road for a year. And industry has exceeded the standard already by nearly 70 percent, despite the regulatory uncertainty.

And you know, Tim -- one of the Tims -- mentioned the portfolio approach of the standard. We've already seen and heard today from biodiesel and renewable diesel producers reaching record levels in California. Biomethane an being produce today supply a huge chunk of the natural gas fuel mix. Ethanol producers diversifying to lower carbon feed stocks. And even technology companies finding ways and stepping in to find ways to reduce the carbon intensity from petroleum operations. We've only just begun to see the promise of the LCFS. It's time to clear the path forward. It's time to allow the LCFS and companies to accelerate.

We do strongly support the staff's proposal to maintain the strong standards and to go forward beyond 2020. There are now three separate independent reports and analyses demonstrating ARB's proposed targets are, indeed, achieveable. One of those, a recent consulting report that we commissioned together with Union of Concerned Scientists and EDF, shows that we cannot only meet the standards, but we can exceed and reach higher targets by 2025.

The missing ingredient, however, is regulatory certainty. Let's add that key ingredient today or when you vote in moving forward with the readoption.

We also commend and thank the staff for their

very hard work on this program and enhancing the program. These enhancements will make the LCFS more robust, fully capture technology options, provide greater flexibility to the program, and help deliver criteria co-benefits as well.

And it will also work to promote and avoid what if scenarios on extreme credit prices or fuel shortfalls. The proposal staff has laid out very carefully is reasonable, is technically supportable, and should be adopted.

We've now demonstrated that we can protect the environment, public health, and grow the economy. You've now heard from a long list of supporters who are standing together to support the Board and staff to move forward. It's time to clear the path and get moving. In the words of Mike Waugh, it's time to giddy-up. Happy new years and thank you.

CHAIRPERSON NICHOLS: Thank you for that quote.

MS. TUTT: Good afternoon, Madam Chair and members of the Board. My name is Eileet Tutt. I'm with the California Electric Transportation Coalition. Our members include five of the largest utilities in California, as well as many of the smaller utilities, a number of auto makers that are committed to clean technologies and alternative fuel vehicles. We work very

closely with the California Municipal Utilities Association on this issue.

We come to you today, not surprisingly, in support of the low carbon fuel standard and its readoption.

I do want to say that I want to really thank staff. Staff has been amazing. And thank you, Mr. Corey, for particularly recognizing Mike Waugh. He was incredible.

We are a small part of the credit values today. We hope to be a lot bigger in the future. The staff never treated us as if we were small. Spent a lot of time working through our issues. You'll read our very brief comments, so I'm not going to reiterate them. But part of the reason they're brief is the account of time that staff spent with us.

There is a couple of things I want to just say just to reiterate Simon Mui. We also conducted a study with ICF and a number of the alternative fuels folks indicating very clearly that we can meet this standard by 2020. And to Dr. Sherriffs, your question earlier about the economic assessment, our economic assessment did include the health impacts. And we showed that in certain cases you can certainly improve the economy by sticking to the LCFS course. So again, thank you for your time and

consideration today.

CHAIRPERSON NICHOLS: Thank you.

Mr. Moran.

MR. MORAN: Good afternoon. Ralph Moran with BP America.

We did submit very detailed written comments, so I hope you get a chance to take a look at those. But today wanted to focus on two items. That's the cost of the program and the greenhouse gas emission reductions that are attributable to the program.

A lot has changed since 2009 when the LCFS was first adopted. And along with that are the conclusions from the original economic analysis supported the adoption. Back then, it was suggested that the program was going to save fuel consumers billions of dollars because these new fuels are going to be cheaper than the conventional fuels. That analysis also concluded that there was going to be a negative carbon price associated with the low carbon fuel standard, somewhere between negative 120 and negative $140 per ton.

So now the regulation puts in place a cost cap of $200 per ton. And in reading some of the written comments submitted by others, I notice that some of the proponents of low carbon fuel standard are expressing their concern that $200 is not high enough because it's not enough to

bring these new fuels to market.

Now I know that there is uncertainty in models and in economic analyses, but we should at least be able to rely on them to get the sign read. There is a big difference between saving billions of dollars and costing billions of dollars. And I hope that difference would cause the Board to pause and at least reflect on where is this going cost-wise.

Secondly, there's sort of a concept is not very well understood about greenhouse gas reductions and the low carbon fuel standard. Simply put, there are no incremental greenhouse gas reductions that come from the low carbon fuel standard. And the reason for that is the sources of emissions covered under the LCFS are already covered under the cap and trade. So the low carbon fuel standard only displaces emissions reductions that would otherwise occur in the cap and trade program. And those reductions that come from the cap and trade program would also produce co-benefits, so it's even difficult to say there is any co-benefits, incremental co-benefits that come from the low carbon fuel standard.

So what the low carbon fuel standard really does is shift reductions from occurring in a very cost-effective, efficient cap and trade program and forces them to occur in a complex, high cost program. How high

is that cost? Right now, the emission reductions cost about twice as much in the low carbon fuel standard. And people are expecting that that range -- that gap will increase. That's why we have a $200 per ton cost cap in the low carbon fuel standard when we only have about a $40 per ton minimum cost in the low carbon fuel standard.

So going forward and to conclude, we have a lot of work to do in meeting the state's long-term greenhouse gas policies. We would rather the state focus on the most efficient and cost effective ways to do that, like a well-designed cap and trade program. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Mr. Magavern.

MR. MAGAVERN: Madam Chair and Board members, Bill Magavern with the Coalition for Clean Air.

I was part of the group that stood with then Governor Schwarzenegger when he first announced the low carbon fuel standard to the world. I think it was eight years ago. And I continue to think that this is a valuable policy and the Coalition for Clean Air supports the readoption of the low carbon fuel standard. It now, in fact, looks even more important, given as many speakers have pointed out the governor's goal of reducing oil use in cars and trucks 50 percent by 2030, which is a very important goal and one that we certainly want to help all

of you and the other agencies in trying to realize.

One of the main benefits of the low carbon fuel standard has been that it for the most part keeps the dirtiest highest carbon fuels out of California, like the tar sands oils that our friends in Canada so very much want to export to us but would have major consequences to our air and climate.

In addition, as air advocates, we are particularly attracted to the value of the low carbon fuel standard in bringing in cleaner fuels to reduce criteria air pollution. As the South Coast Air Quality Management District pointed out, this standard helps us get closer to attainment of our air quality standards.

California's LCFS has also made a major contribution by being I think the very first jurisdiction to consider indirect land use conversion. And we continue to support that element of this standard.

You've made a couple good additions I think on this round. The recognition of the value of electricity used in transit and in forklifts will help us to continue to clean up those sectors. And we also appreciate the incentives for the refineries to clean up their operations, which as you know, tend to be in communities that have suffered from some of the worst environmental injustices. So this should help some with those

fence-line communities.

So we support and thank the Board and staff for your work.

CHAIRPERSON NICHOLS: Great. Thank you.

MR. NOYES: Good afternoon, Madam Chairm, members of the Board and staff.

Thank you for the opportunity to introduce and speak to this hearing. I'm standing in today is attorney for the law firm of Keys, Fox, and Wheatman and also Executive Director for the Low Carbon Fuels Coalition and like to speak in strong support of the readoption.

It's been said before, but I think recognizing Mike Waugh's work and all the staff and high level leadership that went into the program can't be emphasized enough. Mr. Waugh really set the standard out there in terms of being truly receptive to input, constructively engaged with stakeholders, and Ms. Sideco and others managed the really massive organizational task of keeping these multiple -- what I viewed as multiple rulemaking reallys integrated sufficiently but addressing the very particular details of stakeholders out there and met what I call the gold standard of rulemaking as a regulatory attorney. So really appreciate that.

The program is working well, as has been emphasized by many. There was no way at the beginning to

predict exactly what the fuel mix was going to be. Of course, we need to try to do that. We need to do our best models. We've heard that cellulosic biofuels have been slow to commercialize. That's certainly the case. However, renewable natural gas and renewable diesel have been fast to commercialize.

So with the kind of portfolio approach that we have here, there is that kind of flexibility. And it's clear from all the objective analysis that's gone in out there that these fuels are available. They're driving the clean economy. They're also driving the political discussion, particularly in the western states right now. We see some real paralysis around the renewable fuel standard on the federal side. So California's market signal is very important out there to the continued growth of the clean economy and all of the different low carbon fuels are out there.

We have seen -- this program is really one of the key workhorses of AB 32. We have seen ten million metric tons in reductions already. That is simply astounding. And ARB holds a unique responsibility and leadership role under the greenhouse gas revenue fund and essentially investment portfolio. And I would recommend that as the Board takes really the benefits of this program and looks at what to do with what's probably going ton in excess of

two billion dollars in year into the greenhouse gas revenue fund, really think about that as a wise investor, look at this wide portfolio of solutions in the transportation sector of the toughest sector out there and figure out how to get the most cost effective reductions possible. Thank you for your time.

CHAIRPERSON NICHOLS: Thank you.

Jamie Hall.

MR. HALL: Good afternoon, Madam Chair and members of the Board.

My name is Jamie Hall, Policy Director for CALSTART. We are a non-profit organization that works with almost 150 companies bringing cleaner transportation solutions to market, here, today, as you can imagine in strong support of the low carbon fuel standard. Want to thank Board and staff for leadership on this. It's been a lot of hard work and it's good to be here today.

The LCFS provides a really important market signal for this industry that's driving investment. It's driving innovation and driving market penetration of cleaner fuels. Readopting the LCFS will make this signal even stronger and will accelerate the progress we're already making.

We held a summit on clean low carbon fuels earlier this month. Many of you were there. We had 50

companies that were engaged in biofuels, natural gas, and electricity and other fuels. The clear signal from this very diverse group was that the LCFS is working.

Of course, there are a lot of other things people would like to see. They would like to see more investments, as Graham just mentioned, like the very successful CEC investments that handsome Tim Olson mentioned this morning. They'd like to see stronger longer-term targets and signals. But the number one message across the board was that the LCFS needs to move ahead. We need to get back on track. So happy to be here in support, and we look forward to working with you on the next steps.

CHAIRPERSON NICHOLS: Thank you.

Mr. Hedderich.

MR. HEDDERICH: Chair Nichols, members of the Board, thank you. In particular, you pronounced my name right.

I'm Scott Hedderich with Renewable Energy Group. We are North America's largest biodiesel producer, over 350 million gallons of fuel. We also produce renewable hydrocarbon diesel. Also pleased to say we have a significant R&D operation in California in south San Francisco that looks at renewable chemicals and other advanced products.

When you're 45th on the list, you're expected to be brief. So is this perfect? No. Is it really good? Absolutely. Absolutely. Have staff been responsive? They've been the epitome of professional in dealing with all stakeholders.

So with that, please move forward with the adoption. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Katherine Phillips.

MS. PHILLIPS: Feel like I'm on the Price is Right.

Katherine Phillips with Sierra Club, California. I'm going to keep this very sweet. Thank you for all the work you put into this. Thank you for persisting, despite the court challenges. And there is an expression. It's time to fish or cut bait. I say let's fish.

Thank you. My members support this.

CHAIRPERSON NICHOLS: Okay. Mr. O'Connor.

MR. O'CONNOR: Chair Nichols, distinguished Board members, Tim O'Connor, Environmental Defense Fund.

Environmental Defense Fund has participated in studies showing the feasibility of this standard. We've documented the tremendous health and economic savings that are associated with the full implementation of this alongside cap and trade.

We've shown the dramatic growth of businesses throughout California that are engaged in the value chain of delivering these fuels up and down the state. And we've profiled the amazing innovation that California businesses and business leaders have brought forth to bring these fuels.

And for that reason, we, of course, see that this standard is working and support its continued readoption. But as an attorney that's been following the court cases of this regulation, I must say that there, of course, have been some comments filed today that assert that what we're doing is still not going to comply with what the court had wanted or what CEQA requires.

And I must say in this readoption process, which is now over a year in the making and which piles onto a tremendous process that went into the first standard adoption, that I have not seen a record of decision and a level of analysis such as which has been brought by the staff and by the Board. And I'm continually impressed with all the work that continues to go in. And I'm confident that as the Board comes to a decision on this, it will be based on reason and sound analysis that's presented to it and should hold up with all the legal standards which the court will require. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Kirsten James.

MS. JAMES: Good afternoon, Kirsten James representing Ceres and Bicep.

So for those of you who with us, we are a nonprofit organization working to mobilize the investor and business communities with policy members to pass meaningful energy and climate legislation and help a thriving sustainable global economy.

Bicep stands for the Business for Innovative Climate and Energy Policy. And this is a project of Ceres. It's a coalition of 34 mainstream businesses which are committed to the efforts on passing meaningful climate and energy policies.

So together, these 34 businesses represent over $350 billion in annual revenues and coalition members range from Nike to Patagonia to Gap to Ebay, to just name a few.

So Ceres combined with Biceps and our investor network have long recognized the significant economic risks and opportunities associated with climate change. Thus, we strongly support the readoption and extension of the LCFS program as it's a proven market-based technology neutral tool. The LCFS will reduce climate risk and foster economic opportunities.

So you've already heard today about the

feasibility of the program, and I'm going to focus really quickly on the economic benefits. So from the business and consumer side, we see that this is an important route for it in order to insulate businesses and consumers from the oil price volatility and we need that diversity in our fuel supply.

Secondly, from the societal benefit standpoint, we believe the LCFS will result in an estimated 1.4 to $4.8 billion in societal benefits by 2020 from the reduced air pollution, for example, an increased energy security.

Next on the job side, in addition to the growth of the clean fuels industry, we'll move California forward economically. Currently, 40,000 California businesses serving advanced energy markets, employing roughly 430,000 employees. So the LCFS alone could contribute at least 9100 jobs in our estimation.

And then finally on the investor side, Ceres has a strong and extensive investor network, and we truly believe that in order to spur innovation and allow the clean fuels industry to continue to grow, the investors need these long term policy signals. And to provide these signals, it is critical not only to readopt the LCFS, but to extend the program as well.

So in conclusion, we strongly support the readoption of the LCFS as it's an effective and necessary

tool for reducing carbon emissions in addition to bringing significant economic benefits. Thank you.

CHAIRPERSON NICHOLS: Great. Thank you.

Mckinly Addy, and our last witness is Christopher Hessler.

MR. ADDY: Good afternoon, Madam Chair and Board members. It's McKinly Addy.

CHAIRPERSON NICHOLS: I'm sorry.

MR. ADDY: That's okay. A lot of people tend to turn the name around.

But I'm the Vice President of the company called Adtra. We are virtual integraters of low carbon high efficiency technologies at scale. That's what differentiates us from a lot of other companies in the clean energy space.

But our company supports the objectives of the low carbon fuel standard and its readoption. I want to commend the staff for their very hard work. Many of them I worked with when I was at the California Energy Commission.

I also particularly want to highlight John Corey, Neal as well as Katrina Sideco, but particular John and Neal because of their very hard work on dealing with the very challenging topic in the treatment of indirect land use change emissions. We started sort of working on that

when I was at the Commission as well.

But we believe that transportation natural gas is a strong candidate for helping compliance with the low carbon fuel standard. Combined with next generation natural gas engines, which are near zero emission for NOx and PM, but also when combined with renewable natural gas, you have a real option for true zero emission transportation propulsion solutions. Near zero greenhouse gas emissions, near zero NOx, near zero PM.

I want to highlight a cautionary note here, and it's the enthusiasm for the readoption. In other meetings that I've attended, many of the participants talk a lot about the need for government incentives to get a lot of these low carbon transportation fuel solutions into the marketplace. What you don't hear about are the private capital requirements for the successful penetration of these technologies at scale that would move forth the policy objectives that the low carbon fuel standard and the State alternative fuels plan have laid out.

So I'm wondering whether it made sense for the staff to consider as a contingency what might happen if some of the key players in low carbon transportation fuel space don't have access to capital and therefore might not be viable. What might that do with the possibilities for compliance with the low carbon fuel standard. That's the

recommendation. And with that, thank you for the chance to give input here.

CHAIRPERSON NICHOLS: Thank you, Mr. Addy.

Last witness, Mr. Hessler.

MR. HESSLER: Good afternoon. I'm Christopher Hessler with AJW. Our firm's expertise is around advising clients regarding how public policies will influence market demand for innovative energy and environmental technologies.

A couple quick points. Number one, the program as many have said is working. And it is influencing market demand.

And secondly, I want to talk about scarcity and the issue of this $200 pricing, what we would expect in the market as a result.

On the first, about five years ago, one of my friends in the petroleum industry when I said, you talk about feasibility and this program is feasible, define feasible to me. And he said, one and a half percent reduction, that's as far as we can see it going. Today, the oil industry testified that five percent was as far as they could see it going. So by my math, we keep going on that progression by 2020, we'll be at 15 percent. So everything is fine.

Little more seriously, this program draws its DNA

in many ways from the acid rain program, the first program that really allowed for credit trading as a compliance tool. And that's important because there was at the time of the adoption of the acid rain program one compliance strategy. And that was basically putting bag houses on the back of coal-fired incinerators. That program was the single most successful environmental program in the United States. If we measure success by early compliance, by over compliance, and by the relative cost of compliance, relative to initial estimates. Here in this technology neutral platform the low carbon fuel standard, we have -- and you've heard today -- dizzying array of fuels that five years ago people weren't talking about as real potential fuels. We've got renewable diesel. We've got the real potential that renewable natural gas can overtake fossil natural gas. We have renewable hydrogen being explored for decarbonizing our base fossil fuel gasoline and diesel. That's happening very rapidly.

On this question of $200, what the staff has proposed is effectively a cap on the marginal cost of this program. The concern in the petroleum industry legitimately is at some moment in the program we don't have -- there is a scarcity. There is not enough fuel or credits for us to comply. Well, in the scarce market, prices go up. And what the staff is proposing is to limit

how high those prices can go. It does two things. It is tremendous consumer protection. It prevents this program will ever having a very adverse consumer effect in the worst case scenario.

The other thing it does is provides the level of confidence and stability of the program that investors and all market actors need to proceed with the program.

So it's an excellent draft. Your staff is indefatigable in terms of their work trying to investigate the best options here. It's a great product. And it will lead the world in the right direction. Thank you very much.

CHAIRPERSON NICHOLS: Thank you very much.

That concludes the witnesses. I'm going to close the record on this agenda item at this point. But the record will be reopened when the 15-day notice of public availability is issued. Written and oral comments received after this date but before the 15-day notice is issued will not be accepted as part of the official record on this agenda item. But when the record is reopened for the 15-day comment period, the public will then be able to submit written comments on the proposed changes.

This will be considered and responded to in the Final Statement of Reasons for the regulation. And if you followed that, you're definitely a pro and probably has

spent more time than you should have at ARB.

But we really do appreciate the importance of this regulation. I can assure you that the amount of time that's gone into it is perhaps more than most regulations I've ever dealt with. But it is proportional to how innovative it is, as well as intellectually challenging. We've had a history of really terrific people working on it.

I would actually like to return to the Board for questions and comments now, but I'm going to call on -- I didn't warn him of this, but I know he's always prepared, fellow Board Member Dan Sperling, because Dan is one of the people who from his post in far distant academia was responsible for helping to design this program, at least conceptually along with colleagues. But I'd like to give him an opportunity to reflect at this stage.

BOARD MEMBER SPERLING: You did surprise me. But I did have actually so many pages of notes that I can consolidate.

You know, looking back historically, it is remarkable how the original concept of this has been robust and has actually been implemented. Mike Scheible was there at the beginning also when we were thinking about this. And really the basic structure has held up, which is really impressive for such a unique, innovative,

hugely important program.

Because what we're talking about here is we're debating details. And even the oil industry as they said, you know says, okay, we don't like some of the details and we think the target is too high, but is pretty much acknowledging that this is a good program for going -- good structure for going forward. And if I go back to those original discussions that we had actually with the oil companies in particular -- and at that time, this is 2007, and they were saying, okay, we see climate is important. Actually, they thought it was more important than now. And they said this is -- this does look like -- if we're going to focus on climate, this is probably about the best way to do it. We can't come up with any better ideas. And through all these years, I've given many, many talks. And people always criticize it. I say, well, do you have a better idea? And I have to report after, what, eight years now. I haven't heard anyone come up with a better idea, except maybe carbon tax or oil industry now likes cap and trade I noticed.

So you know, I'll summarize. But I think I like all the changes that the staff has proposed here. I think the three most important are the cost containment provision, the price cap, the streamlining of the certification process. And that one in particular is

because what we have here is not only something important for California, but to the U.S. and the world. It has to work elsewhere. It has to be easily replicated or compatible in some way.

So this effort to streamline the administrative part of it I think is really important. And in fact, if I said anything, you know, if I suggest anything big, it is that going forward we keep thinking about how can we streamline it even more. How can we make it so it really is compatible with other stats and can be scaled up nationally and internationally.

And the third part that I did want to strongly support is the idea of incentives at the refinery level and upstream. And in terms of encouraging carbon capture and sequestration and other kinds of improvements. I think all of those are really important as we go forward.

So I guess one other comment and that is there was a lot of discussion that really dealt with the idea of making it science based, but at the same time others talk about certainty. And there is a tension there. And we're I think the staff has been working hard at trying to figure that out. Just the ILUC is a good example of it is going -- to get precision on that means -- to bring science to that, we are going to be updating it over time as we learn more. But it would change it then we're

reducing certainty and regulatory certainty. So how do we manage that process going forward.

And I think we stick to the numbers as much as possible. We stick to the process and the methods as much as possible. And we deviate only when the scientific evidence is really strong for making it different. And so in the case of ILUC, there is a proposal to reduce the ILUC, as many have suggested and the science as I see it supports that. And so there will be that.

So the only other thought I would have is that it has been -- there is a question is it really successful or has staff overstated it by saying it's been a very successful program so far. And depends how you define success, of course.

But as we heard here, there's so many companies and so many processes and so many fuels that are being developed that we did not anticipate at the beginning. And we have been disappointed the cellulosic technologies have not gone forward as much and as fast as we hoped for at that time as expected. On the other hand, a lot of these biodiesel renewable, diesel have gone forward much more so.

We always thought in the beginning the diesel part of this was going to be a really hard part and the gasoline part was going to be the easy part. Turned out

to be just the opposite. And that just lends more support for the whole structure of this is that we have created something that is technology neutral, that does provide incentive, that is market based to a large extent. And you know, in that sense, it's working now. Yes, we're only at one percent reductions, so I don't think we should be claiming too much credit yet, because we have a long ways to go.

But it is headed in the right direction, and I don't -- I personally don't see any major speed bumps along the way. And so I look forward to this as it evolves over time and will be thinking in a couple years from now what next.

CHAIRPERSON NICHOLS: Great. Thank you.

Mrs. Riordan.

BOARD MEMBER RIORDAN: Yes. I have a question to the staff.

Attachment A is I think important to us. And I wondered after listening to the testimony if your bullet points coverevery thing that you feel needs to be covered there or if there is something you would wish that the Board might add to give you some latitude to deal with something you might not necessarily have thought of at the time of the printing, but after the hearing, you feel might be helpful to you.

BRANCH CHIEF WADE: We feel like the list you have in front of you is relatively inconclusive. We'd like to highlight a few things on that list.

First, we believe a targeted public process on the GREET changes, especially with respect to natural gas vehicles, is essential. And we plan to conduct that prior to releasing a 15-day package.

Secondly, we feel the refinery investment provisions do deserve a little bit more attention as well in that time period. So we'll be going through the 65 or so written comments we received. Go out and have that dialogue with stakeholders on those issues. Release a 15-day package and return to the Board tentatively in July or so.

BOARD MEMBER RIORDAN: Thank you.

CHAIRPERSON NICHOLS: So just to an addendum to that. It's probably included in this, but this vexing issue which Dr. Sperling also mentioned of how you update based on new information, but not do it so often that you create uncertainty, have you thought about or are you prepared to think about including a specific provision on how frequently this matter will come back with amendments?

BRANCH CHIEF WADE: Certainly. We do believe having additional certainty for a period of essentially around three years or so would be useful. The work that's

done on these complex models takes a huge amount of staff resources and does take away from the implementation of the program or the day-to-day running of the program. So --

CHAIRPERSON NICHOLS: From the time of adoption, whenever that is, hopefully this summer, you would then put in that regular three-year process for updating the science?

BRANCH CHIEF WADE: I think we have a time line for general program review. But we feel like the revisiting of the models is separate from --

CHAIRPERSON NICHOLS: Are two different things. Right. Right.

BOARD MEMBER SPERLING: To follow up on that, there has been a question that a lot of the -- some of the stakeholders have talked about, the natural gas the most, about the process part of that.

And I do -- so the question is should there be a more formal process or the stakeholder engagement in dealing with these GREET numbers and perhaps others. And I'm up of the mind that it should not be a formal process. But I think that's probably something that should be considered at some point. It really -- I think that the stakeholders pretty much feel comfortable that the staff has done a very good job of incorporating it. But in this

modern day and age of transparency and so on, I think it is something that should be considered.

CHAIRPERSON NICHOLS: I think we should at least address the type of review and the process for review in a more robust way than we have until now.

Other comments at this point?

Yes, Ms. Berg.

BOARD MEMBER BERG: I'd just like to follow up on the timing of the actual review. If we look at we are in 2015 now, and I know in the staff report we have 2017, it feels to me that the first getting back on track is 2016 and we'll be circling back.

I think it would be helpful maybe to distinguish the type of informational how we're going to come back to the Board. For example, I would be interested -- very interested around the '17 time to understand how the investments are doing, to look at how the program is now ramping up or any challenges that we're having. But as far as doing a program review, much before we have a couple of years under our belt, I think would be more uncertain than creating the certainty. So I'd like to look at --

CHAIRPERSON NICHOLS: A progress report.

BOARD MEMBER BERG: Exactly. Rather than a review. So in looking at the 15-day changes, I would

encourage instead of as outlined in the staff report that we're looking at an update in 2017 that you come back to us with a mix maybe of Board briefings on particular topics that are of interest to the Board and then actual program review and model review. So when we're voting on it, that it's a little bit more clear both for us and expectations that we're setting for the stakeholders and the market really what we're looking at. Thank you very much.

CHAIRPERSON NICHOLS: I see a head nodding there. I think that's acceptable.

BRANCH CHIEF WADE: That makes a lot of sense to us. We're happy to pursue the details of that with you moving forward.

CHAIRPERSON NICHOLS: Great. Other comments or questions before we call the question?

Yes. Supervisor.

BOARD MEMBER ROBERTS: I'll go quickly. It's obvious from the review we're talking about if there are things that are not going as we think, we want to highlight those for sure.

On one of the slides, there was a comment about add electric transit systems and electric forklifts. I don't want to leave that out. I'm sure that's important to somebody who is eligible to generate credits. Can

somebody elaborate more on what are the rules? I presume we're talking about public transit systems.

BRANCH CHIEF WADE: That's right. So we're talking about light rail or electric buses with fixed guideways. And essentially, this is a new crediting provision for those types of transit systems. Do you want me to go into details of how?

BOARD MEMBER ROBERTS: Would it be on existing systems?

BRANCH CHIEF WADE: Yes, on --

BOARD MEMBER ROBERTS: And new systems?

BRANCH CHIEF WADE: -- are eligible, yes.

BOARD MEMBER ROBERTS: I'm curious about that. We're just getting ready to --

CHAIRPERSON NICHOLS: San Diego is looking for some new investments here.

BOARD MEMBER ROBERTS: That may be the nicest thing that happened. But I know I can provide a slide, but we're also exploring a new overhead electric system, a gondola, an urban gondola. I presume since that's all electric, that would apply.

BRANCH CHIEF WADE: We would happy to evaluate that project when it comes forward.

BOARD MEMBER ROBERTS: I seems we're beyond the exploring state. I presume that would fit into the

category also.

CHAIRPERSON NICHOLS: Yes, the general category.

BRANCH CHIEF WADE: The general category, yes. We have to look at the actually --

BOARD MEMBER ROBERTS: We're not just saying light rail.

CHAIRPERSON NICHOLS: If it doesn't have wheels that go along the ground.

BRANCH CHIEF WADE: There is none of that in the definition. It believe that's the first case of this that we've seen it.

BOARD MEMBER ROBERTS: You'll see more of them I think. But that's far more efficient and cleaner than any other kind of transportation that we're aware of.

BOARD MEMBER SPERLING: Just to encourage you more, if you look at how much these credits could be worth -- so bring this back to San Diego -- is that these are worth in the tens of thousands of dollars. It depends on how much they're used and what the credit value is. We're talking about tens of thousands of dollars over a 10 or 15-year period for each, like a bus equivalent. So it's not trivial, but it's substantial. So what we'd like to see is cities making these investments, this will stimulate more investment

BOARD MEMBER ROBERTS: No, you know, I can share

with you. Any of these things, they don't cover their operational expenses. So anything that can go to further that will be an incentive to increase those systems. It's at 26, $27 dollars right now as I understand it with the $200 cap. I'm not trying to push to get it out. But we'll see how the market works. I promised everybody that's involved in light rail that we --

CHAIRPERSON NICHOLS: You're down at the other end looking at starting up a bus company. So --

BOARD MEMBER MITCHELL: I'm thinking the gondolas at the ski resorts.

CHAIRPERSON NICHOLS: Supervisor Gioia.

BOARD MEMBER GIOIA: It was really good to hear from the range of speakers and really the excitement about this whole new field of alternative fuel development. I mean, it truly shows this when it was an active fuel neutral and something happened that sounds like this Board when it passed expected and some of the things happened that it didn't expect. That's sort of the true measure of the fuel neutrality.

But I think this is a very important rule regulation. And it's part of a whole suite of measures this Board has adopted to really encourage the development and demand for alternative fuels and alternative vehicles. I think it's accomplishing that. They all don't -- each

of them don't achieve success on their own. It's all how they work in tandem in conjunction with each other, the cap and trade program, the clean cars program, low carbon fuel standard. And we understand that, that they're all intertwined. They're all important. And we need them all in order to achieve success. It was great to hear the excitement and the positive successes that have happened as a result of this original regulation.

CHAIRPERSON NICHOLS: Other comments.

Mr. Balmes.

BOARD MEMBER BALMES: I actually have a question. And it may be more appropriately addressed in the future. I don't want to hold us up.

But on slides 19 and 20 of the staff presentation, you show fairly impressive decreases in the carbon intensity for sugar cane ethanol, corn ethanol on the gas substitutes. And likewise for soy bean biodiesel.

And I realize this comes from a re-evaluation of the -- probably comes from a re-evaluation of indirect land use, but could you -- I don't need sort of a super detailed answer with regard to the model. But in terms of the major changes in the model, could you summarize what those are? Since there's been a lot of controversy over how we calculate the carbon intensity values. So this is a big picture answer, not down in the details of the

model.

BRANCH CHIEF WADE: Let me open it up by saying the ILUC changes are some of the major drivers we've seen. If you'd like a bullet list of what some of those are --

BOARD MEMBER BALMES: A bullet list would be good.

MANAGER SINGH: Let me just say briefly -- and I can go more on this. Between 2009 -- I'm very passionate about what I do. I could go on forever.

Between 2009 when we first presented in '09 ILUC was something, you know, nobody had heard of and there was a lot of controversy. And over the course of the last five years, people have embraced indirect land use change.

In terms of the model, land use science has improved tremendously between 2007 through 2014. We have incorporated several of the changes in new data sets that have come out and new science that has come out with land use change.

To sort of summarize the critical changes that have impacted the indirect land use change results that we are presenting today is we made structural changes to the model to reflect how land conversion happens in the world. Originally, one of the contentions was we're changing a lot of forests in a lot of the countries of the world. We made structural modifications to account for more of the

changes going to pasture land and land that is comparable to pasture land, which is used for crop growing. That was one of the biggest drivers that lowered land use change numbers.

The other one was the productivity of existing and new crop land. When you have new land that is converted, in the 2009 analysis, we had just an average number. But we had a lot of science and work that went into. Of course, we have to give consider to Purdue University and we implemented some of those changes.

Overall, our methodology and understanding of indirect land use change has tremendously changed between 2009 and today. And we've implemented sort of what we call harmonization of treatment across all biofuels that we've analyzed. That's sort of a quick summary.

BOARD MEMBER BALMES: That was just what I asked for and only a passionate person could have given it to me.

CHAIRPERSON NICHOLS: Great. Yes, Dr. Sherriffs.

BOARD MEMBER SHERRIFFS: Actually going back to a comment I made earlier. In terms of the reviews -- not the word we want to use -- but in 2017 report, I would like to be sure that staff looks at, in fact, trying to measure some of the health benefits that have come out of this and reporting back on that because I do think that's

an important aspect of what we do with this.

BRANCH CHIEF WADE: Let me just ask you, so quantifying health benefits and assigning them economic value or quantifying them?

BOARD MEMBER SHERRIFFS: Boy, if you can do both, go ahead.

The other thing I would want to say, Mr. Corey, there was lots of thanks for all your work here. I think you can acknowledge that thanks by taking a weekend off.

CHAIRPERSON NICHOLS: The whole weekend? Wow. Okay. I think we're nearing time for a vote on the Resolution here.

I do have just one additional comment that I want to make. And I hope it's taken in the right spirit. But obviously, we did not hear a lot of support from major oil companies here at today's hearing. We heard a lot of support from others, but continued if not more serious I would say opposition to the very concept of a low carbon fuel standard, which is disappointing. And I'm not going to try to debate that politics or the economics of it really at all. But just to talk a little bit about the fact that there was a comment -- and I can't remember -- I think it was Chevron commented about the fact that we weren't really creating certainty because in the mind of the witness they didn't know how they were going to comply

and, therefore, the technology is uncertain. And, therefore, there was not such a thing as certainty.

It just made me want to reflect and comment that this Board has for decades now been in the business of setting technology-forcing standards that were ahead of exactly where the people who were regulated knew how they were going to comply, but were based on a substantial knowledge and analysis of the potential for technology, as well as increasingly more sophisticated economic analysis, which doesn't mean that we're perfect or that we're ahead of where companies are in terms of analyzing their own businesses, but just that we think we are well rounded in terms of what the potential is for compliance here.

And I think it's important that perhaps this is not an area that the petroleum industry is accustomed to being pushed in. And I just want to say that I think we have a good track record of working with the regulated community and adjusting regulations, when it turns out that our predictions were wrong. But that overall by pushing towards goals that we believe are achieveable and occasionally adjusting time lines, if we had to, that we've achieved just tremendous progress and we look forward to doing the same thing here.

BOARD MEMBER SPERLING: So let me just elaborate just a bit on this.

This being serious, this really is hard. The challenge we've laid out really is a huge, challenge and we shouldn't understate that. And we should also appreciate -- and for the oil industry, I mean, we're basically telling them, you know, we want you to change your business model and your main product. And that's pretty tough stuff.

But at the same time, this is the larger social goal of the goal we're aiming for. So you know, I can sympathize with the oil industry. We're attacking their basic business model. But we are as, Chairman Nichols was saying, we are providing a lot of flexibility. We're providing -- the staff is creating incentives for doing things like CCS. So I think we are going out of our way to try to make this transition and this transformation as smooth and as efficient as possible while still achieving the goals that we're aiming for.

CHAIRPERSON NICHOLS: Thank you. Without further ado, do I have a motion?

BOARD MEMBER GIOIA: I'll make a motion.

BOARD MEMBER SERNA: Second.

BOARD MEMBER GIOIA: And a comment.

And I think it's important to acknowledge you were on a panel with an executive from Shell on alternative energy. Frankly, it is entirely possible for

the oil companies to do more of what Shell's doing, which is looking at alternative opportunities, alternative fuel opportunities. So while it may be a challenge to their existing business model, it will help develop a new business model. So or help move toward a new business model.

CHAIRPERSON NICHOLS: Okay. We have a motion and a second.

All in favor please say aye.

(Unanimous aye vote)

CHAIRERSON NICHOLS: Any abstentions? All right. Thank you very much. Everybody.

And we'll be back. We have one item related to this one. The last item today is the proposed regulation on commercialization of alternative diesel fuels. And this is the issue that was directly connected with the challenge to the low carbon fuel standard. Because of the successful implementation of renewable fuel policies like the low carbon fuel standard, a variety of innovative alternative diesel fuels are currently in the marketplace or in development.

People, please if you're going to chat, do it outside because we are taking up the next item.

There is a variety of new types of diesel fuels that are currently in the marketplace or in development in

laboratories and demonstration settings. To ensure that these fuels are available to help us transition to a low carbon future, staff is proposing new regulations that streamline the requirements for emerging alternative diesel fuels. It also will provide for robust environmental review of these fuels before they enter the market to ensure that current environmental protections are maintained.

Mr. Corey, please introduce this item.

EXECUTIVE OFFICER COREY: Yes, thank you, Chairman Nichols.

Since the initial implementation of low carbon fuel standard, significant changes have started to occur in California's fuel market which we talked about that for a while. The carbon intensity of our state's fuel pool is declining. As fuels like renewable diesel, biodiesel, natural gas, ethanol, electricity, and hydrogen are more prevalent, today's proposed regulation represents a vital step in supporting this important transition.

Staff's proposal today provides a clear pathway of commercialization of alternative diesel fuels, incorporates the best available science, and maintains our current environmental protections. In particular, the proposal will address NOx emissions related to the use of biodiesel.

The proposal works in conjunction with proposed low carbon fuel standard re-adoption you just heard about to ensure that we deploy fuels that contribute to our climate and as well as our air quality goals.

In addition, staff's proposal is part of ARB's response to the State Appeals Court decision we talked about earlier.

Now I'd like to invite Lex Mitchell of the Industrial Strategies Division to begin the staff presentation.

(Thereupon an overhead presentation was presented as follows.)

MANAGER MITCHELL: Good afternoon, Chair Nichols and members of the Board.

Today, I will presenting the proposal to establish a regulation on the commercialization of alternative diesel fuels, also called ADFs. As with the earlier item on the LCFS, we will not be asking the Board to take any approval action today.

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MANAGER MITCHELL: As an overview, there will be five portions of this presentation which are listed here. We will first discuss the need for the proposal, then provide background, and outline our regulatory development process. We will then discuss the proposed process for

approving alternative diesel fuels, the specific requirements for biodiesel as an ADF, and the impacts and benefits of the proposed regulation.

Finally, we will present potential 15-day changes.

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MANAGER MITCHELL: We will start the presentation with the need for the ADF proposal

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MANAGER MITCHELL: In order to minimize confusion, we will first cover what is and isn't considered an alternative diesel fuel under the current proposal. Examples of ADFs include biodiesel, which is already being used and is the first ADF proposed to be regulated under this process, and dimethyl ether, an ADF in the beginning stages of the environmental review process.

Both of these fuels are chemically different than conventional diesel and neither has an existing ARB specification. Examples of compression ignition fuels that are not ADFs include renewable diesel, which is a liquefied hydrocarbon chemically indistinguishable from conventional diesel and natural gas, which already has an ARB specification.

From here on, blends of ADFs, primarily biodiesel

blends, will be discussed and some familiarity with how blends are referred to as needed. Biodiesel blends are referred to as BXX, where X represents the percentage blend level. For example, B10 is a blend of the 10 percent biodiesel and 90 percent conventional diesel.

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MANAGER MITCHELL: Before we go any further, I'd like to spend some time clarifying the difference between biodiesel and renewable diesel, two terms that frequently get intermixed. Biodiesel is a fatty acid methyl ester and is chemically different from conventional diesel.

The biodiesel molecule contains two oxygen groups, unlike conventional diesel, which contains none.

Renewable diesel, on the other hand, is a hydrocarbon chemically indistinguishable from conventional diesel, but with lower aromatic content that is typically found in petroleum diesel.

Despite their differences, biodiesel and renewable diesel are complimentary fuels. Biodiesel's good lubricity and renewable diesel's good cold temperature performance can complement each other.

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MANAGER MITCHELL: Now that we've covered what ADFs are, why do we think an ADF regulation is necessary?

First of all, ADFs can deliver significant

environmental benefits. And we expect to see their volumes grow as both state and federal policies drive their supply and demand.

In order to encourage this expected increase in ADF volumes, it is essential that market certainty and regulatory clarity be provided to emerging ADFs. As these volumes increase, it is essential that ARB ensure their commercialization is done in a manner that protects environmental and public health.

The ADF proposal is designed to address all of these objectives. In addition the proposed regulation addresses one of the problems a court found with ARB's adoption of the original LCFS regulation in 2009 by addressing potential NOx impacts from biodiesel use.

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MANAGER MITCHELL: Staff has extensively studied biodiesel and renewable diesel emissions and has found that both lower GHG, PM, and toxic emission. For example, a blend of 20 percent biodiesel has been found to decrease PM by about 20 percent.

Additionally, renewable Diesel decreases NOX relative to petroleum diesel primarily due to its lower aromatic content.

Staff has found that biodiesel can increase NOx in some situations in older heavy-duty vehicles. The ADF

proposal applies the lessons learned from the evaluation process for biodiesel in order to develop a process to evaluate future ADFs. In addition, the proposal allows biodiesel use while addressing the NOx concerns recognized during biodiesel testing, maximizing environmental benefits.

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MANAGER MITCHELL: This table shows the LCFS credits generated by biodiesel and renewable diesel in 2014 and 2020. Biodiesel and renewable diesel make up a large and increasing portion of the total LCFS credits as time goes by and significantly contribute to the success of the program.

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MANAGER MITCHELL: In addition to biodiesel, which is already contributing to the LCFS, other ADFs are expected to emerge as incentives continue. Current evaluation of these fuels involves various regulations and statute. The ADF proposal would take these requirements, clarify them, and compile them into one regulatory framework, which will provide additional certainty for proponents of upcoming ADFs, such as dimethyl ether, which is currently undergoing evaluation.

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MANAGER MITCHELL: Let's move now to the

regulatory development process.

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MANAGER MITCHELL: ARB has spent the last eight years developing and conducting studies on biodiesel emissions and analyzing the results of these studies, including spending about three million for testing to understand biodiesel's impact.

In addition to the original research conducted by ARB, staff conducted a literature review and sponsored an independent statistical analysis of the data. Staff has had extensive interaction with stakeholders on our biodiesel program, including 13 public meetings to discuss testing and seven reg development workshops.

The combination of comprehensive biodiesel testing and continual stakeholder involvement and feedback led to the ADF proposal presented today.

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MANAGER MITCHELL: During the multimedia evaluation and additional review of biodiesel emissions, nitorgen oxides, or NOx, was found to be a pollutant of concern whose emissions varied by feedstock.

For example, on this graph, you can see that biodiesel derived from soy feedstocks leads to greater NOx increases than biodiesel derived from animal feedstocks. Whereas, renewable diesel decreases NOx. All of these

impacts were measured for pre-2010 heavy-duty engines. Light-duty, medium-duty, and new technology heavy-duty diesel engines have been found to have no biodiesel NOx impacts.

We'll come back to this slide later in the presentation.

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MANAGER MITCHELL: Moving on to the objectives of the proposed regulation. In development of the ADF proposal, ARB has adhered to the following objectives:

Establishment of a clear pathway for commercialization of ADFs in order to provide regulatory certainty and encourage the use of ADFs. Ensuring public health and air quality protections from ADFs used as a replacement for conventional diesel in order to ensure the integrity of our existing air pollution reduction programs. And establishment of criteria for biodiesel use and NOx emissions control, to ensure that the benefits of biodiesel use can be realized without associated degradation in ozone-related air quality.

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MANAGER MITCHELL: We will now go through an overview of the ADF proposal. The ADF proposal includes two main provisions, the general evaluation process for environmental analysis of emerging ADFs and the fuel

specifications and in-use requirements for biodiesel.

The environmental evaluation process for emerging ADFs consists of three stages, following ADFs from lab to demonstration to commercial scale.

The proposal will limit fuel volumes and consider test location. Through this review and evaluation process, the conclusion may lead to staff to develop additional in-use controls and specifications for that fuel, or if there are no detrimental effects found, only reporting may be required.

The fuel specifications being proposed for biodiesel and, in fact, the three-stage evaluation requirements are based on staff's multimedia evaluation of biodiesel, as well as renewable diesel, both of which are nearing completion and will be completed by the follow up Board hearing.

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MANAGER MITCHELL: Let's move on to the evaluation process for emerging ADFs.

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MANAGER MITCHELL: The three stage evaluation process for commercialization of ADFs was developed to evaluate environmental impacts and control potential detrimental impacts prior to the widespread use of an emerging fuel.

During this process, staff would complete a multimedia evaluation of the fuel to determine adverse emission impacts for any pollutants of concern considering offsetting factors to determine the need for in-use requirements or fuel specifications for the ADF. The mechanism for dealing with pollutant increases would be to set a pollutant control level above which pollutant reduction strategies would be required.

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MANAGER MITCHELL: This graphic shows the three stages and hypothetical volumes of fuel distributed as the fuel progresses through the stages. Initially, an ADF proponent would apply for a pilot program under Stage 1, which would include disclosure of ADF composition, preliminary emissions testing, evaluation of potential environmental and health effects, and volumetric limit of no more than one million gallons per year.

In Stage 2, the focus is on fuel specification development and would include a full multimedia evaluation, consensus standards development, consideration of engine concerns, determination of potential adverse emission impacts, and volumetric limit of 30 million gallons per year.

After completing Stage 2, a fuel may advance to either Stage 3A or 3B, depending on its environmental

impacts. If adverse emission impacts are found, the fuel would be regulated under Stage 3A, which includes development of in-use requirements and fuel specifications. If a fuel is found to have no detrimental impacts, it would be eligible for Stage 3B, where only reporting is required.

As noted earlier, this three stage process is reflective of current regulatory requirements and policies already in place.

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MANAGER MITCHELL: Let's move now to the biodiesel specific requirements of the proposal.

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MANAGER MITCHELL: In order to control the NOx increases from biodiesel, staff developed specific in-use requirements and fuel specifications. The proposal included reporting provisions which begin in 2016, but in-use requirements do not begin until 2018. This time lime allows for implementation of mitigation options for compliance pathways.

A pathway for certification of additional in-use options has been included to allow testing of novel methods the offset NOx emission, including novel Additives, blend stocks, or production methods.

The biodiesel in-use requirements will sunset

when vehicle miles traveled in the on-road heavy-duty fleet is greater than 90 percent new technology diesel engines. This is currently anticipated to occur by 2023. Additionally, the biodiesel provisions will undergo a program review to be completed by 2020.

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MANAGER MITCHELL: Beginning in 2018, biodiesel would be limited to B5 or B10, depending on feedstock and season. Feedstocks under this proposal would be distinguished by cetane number rather than prescription of feedstock source and cetane cutoff for determining feedstock is 66.

Higher cetane biofuels such as animal-based biodiesel tends to produce less NOx than lower cetane biodiesel, such as soy-based biodiesel, and therefore be used in higher blends.

Additionally, blends up to B20 could be sold if they use an additive or other certified control. Biodiesel used in light-duty and medium-duty vehicles has been shown not to increase NOx. Newer heavy-duty vehicles have been shown not to experience the NOx increase from biodiesel as well that is seen in older heavy-duty vehicles due to the use of selective catalytic reduction emission controls. The ADF proposal includes an exemption process for these vehicles.

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MANAGER MITCHELL: You'll recall this slide from earlier. The important point here is that our extensive testing showed that biodiesel are not created equally and the different feedstocks result in different NOX effects. Just as importantly, our testing also showed the offsetting effect on NOx from the use of renewable diesel. These two findings informed the proposed regulation.

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MANAGER MITCHELL: As part of staff's analysis of the effects of biodiesel use, offsetting factors were considered to determine the real world effect of its use, rather than simply the lab results of engine testing.

Most importantly, it was found that new heavy-duty new technology diesel engines or or NTDEs do not experience a NOx increase with biodiesel up to B20 due to SCR emission controls and the heavy-duty market is substantial and increasingly complied of NTDEs.

Additionally, the NOx decrease from renewable diesel means that some of the emissions from biodiesel are offsetting, leading to less need for in-use requirements on biodiesel, especially considering the recent and expected continual increase in volumes of renewable diesel. These offsetting factors combine to eliminate the NOx increase from biodiesel over time, hence the sunset

provisions, by in the mean time controls on NOx are needed.

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MANAGER MITCHELL: This graph shows the increase in vehicle miles traveled by new technology diesel engines as well as the NOx increase from biodiesel.

As newer vehicles become an increasingly large contributor, the vehicle miles traveled in the on-road heavy-duty diesel fleet as shown by the shaded bars. The corresponding NOx increase from biodiesel becomes increasingly reduced.

As you can see, in 2023, when newer vehicles are expected to contribute more than 90 percent VMTs, the NOx increase from biodiesel becomes negligible. At that point, we are proposing to sunset the biodiesel in-use requirements.

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MANAGER MITCHELL: Practically speaking, we expect regulated entities to comply with the regulation primarily by selling biodiesel blends at or below a B5 blend level.

However, the proposed includes other options that will increase flexibility for compliance which are listed here. For example, for businesses geared toward B10 sales, either a high cetane feedstock may be used or any

feedstock may be used in the winter.

For businesses geared toward B20 sales, either targeted sales to exempt vehicles or additive use will accommodate these sales. The table on this slide shows the NOx control level by both feedstock and time of year, which lead to these compliance options.

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MANAGER MITCHELL: As was mentioned earlier, the NOx emissions from biodiesel are expected to decrease over time leading to a sunset of the in-use requirements when new heavy-duty on-road trucks are more than 90 percent of vehicle miles traveled. This is expected to occur by 2023.

Additionally, as the fuel market is still in flux in its transition to diesel substitutes, a review of the program will be completed by 2020. This review will consider a variety of factors, such as SCR adoption and fuel volumes, and whether we are on the right trajectory toward the projected sunset of biodiesel blend limits.

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MANAGER MITCHELL: Let's move now to the impacts and benefits of the alternative diesel fuels proposal.

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MANAGER MITCHELL: Staff prepared one draft environmental analysis, or EA, that covered both the

proposed LCFS and ADF regulations because two rules are interconnected. The draft EA was prepared according to the requirements of ARB's certified regulatory program under the California Environmental Quality Act, or CEQA. The analysis focused on changes in fuel production supply and use. The existing regulatory and environmental setting or the actual physical environmental conditions in 2014 is used as a base line for determining the significance of the proposed regulations impacts on the environment.

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MANAGER MITCHELL: As discussed in the previous presentation for LCFS, the draft environmental analysis identified both beneficial impacts and adverse environmental impacts from the proposed regulation.

Beneficial impacts were identified in the areas of reduced GHG emissions, reduced criteria pollutants, including reduced PM2.5 emissions and energy. The draft EA identified less than significant impacts to certain resources such as minerals and recreation.

Potential significant impacts were identified in a number of resource categories such as agriculture, biological, and hydrology and water quality. Significant cumulative impacts were also identified for resources.

While some of these identified impacts are

related to long-term operational changes, others are potential short-term effects related to construction of new fuel production facilities.

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MANAGER MITCHELL: The economic impacts of the ADF proposal were evaluate in two ways, as part of a state-wide macro economic evaluation of the effects of the ADF and LCFS proposals and as the direct costs of the ADF proposal provisions.

Because the ADF and LCFS proposals were so interlinked, the macro and economic impact of the proposals could not be desegregated and therefore the evaluation was completed using the simultaneous effects of both proposals on fuel volumes and prices.

As was discussed in the LCFS presentation, the macro economic evaluation employed a conservative framework and found that the combination of proposals would have a very small impact on the overall state economy.

Compliance with the ADF provisions are expected to result in costs of about one-tenth of a cent per gallons on B5 diesel in 2018. And as the fleet transitions to newer engines is expected to shrink and eventually be eliminated by 2023. For biodiesel producers whose business is reliant on sales of higher biodiesel

blend levels and who are not located near a terminal with biodiesel blending facilities, there are will be additional challenges to the regulation.

Staff continues to work with stakeholders to identify additional flexibility to address this challenge while maintaining the NOx protections of the proposal.

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MANAGER MITCHELL: The primary reason why alternative diesel fuels and other diesel substitutes are important and should be encouraged is due to their variety of beneficial impacts. For example, biodiesel, renewable diesel, and dimethyl ether can all reduce PM and toxics compared to conventional diesel, leading to lower localized toxic exposure, and renewable diesel can reduce NOx emissions.

All of these fuels can be produced from feedstocks that lower greenhouse gas emissions and are capable of contributing to our 2020 and 2030 air quality goals. Additionally, all of these fuels can be produced from domestic sources produced in the USA, leading to increased energy security.

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MANAGER MITCHELL: We will now move on to 15-day changes and next steps.

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MANAGER MITCHELL: Staff has included some potential 15-day changes for consideration in Attachment A of the Resolution. Examples of potential changes include further flexibility for captive fleets that would not adversely effect air quality, clarification of certification procedures, definitional changes, and minor clarifications, and corrections.

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MANAGER MITCHELL: This is the first of two Board hearings so the Board will not adopt the ADF today. We recommend that the Board direct staff to continue working with stakeholders to refine the proposal and coordinate development with the LCFS team.

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MANAGER MITCHELL: Going forward, staff will complete and respond to comments on the environmental analysis document. The peer review of our biodiesel multimedia evaluation is in progress and the multi-media process will be completed by the second Board hearing.

Staff will also propose 15-day changes for comment prior to the second Board hearing.

Thank you for your attention. This concludes staff's presentation. I would be happy to answer any questions you may have.

CHAIRPERSON NICHOLS: We do have 14 witnesses who

have signed up. But yes.

BOARD MEMBER SERNA: Thank you, Madam Chair.

Quick question for staff on the chart that you showed twice that showed the NOx effect of biodiesel in older heavy-duty vehicles, are you encouraging us not to get too hung up on the soy feedstock biodiesel because that's only applicable to the older engines. And with the introduction of newer engines that that NOx concern will go away?

MANAGER MITCHELL: I wouldn't characterize it as the difference in the feedstocks. We think that the NOx effect goes away over time, like you said, due to the newer vehicles. More or less what the proposal does is it assumes that unless you take an action and use a cleaner feedstock that you're using one of the soy feedstocks, which we consider the lower cetane fuels.

ASSISTANT DIVISION CHIEF KITOWSKI: Maybe I can recharacterize that a little bit.

The use of soy and animal as part of the testing programs, but they weren't very good metrics for regulation. So in moving from the test program to the regulation, we shifted from soy and animal feedstocks to high saturation or high cetane and low saturation low cetane. They're area pretty much analogous.

BOARD MEMBER GIOIA: Thank you.

CHAIRPERSON NICHOLS: Before we go, you have a question?

BOARD MEMBER ROBERTS: You'll have to indulge me. I know I'm the only one that doesn't know the answer to this.

The difference between biodiesel and renewable biodiesel? And why do they call it renewable because it doesn't seem like it's renewable?

MANAGER MITCHELL: Biodiesel and renewable diesel are both produced from the same feedstocks. Those are any fat or oil that you can find.

The difference is in the processing. So the biodiesel process is it takes this kind of lighter chemical treating to create this fatty acid methyl ester, which is a distinct type of chemical.

Renewable diesel takes those same feedstocks and it uses a more similar to a refinery process a hydro treating process to create a fully non-oxygenated saturated fuel.

The reasoning why they're called something different I think is that biodiesel was kind of the first adoptor of this technology so that biodiesel was there first. And then to distinguish, they just wanted to make sure that what people are calling fatty acid methyl esters is biodiesel and it's different from renewable diesel,

which came along later. So it's not that one is renewable, one's not.

CHAIRPERSON NICHOLS: Renewable sounds good and --

BOARD MEMBER ROBERTS: It sounds like it's going to be there after you use it. So --

CHAIRPERSON NICHOLS: It's just terminology.

BOARD MEMBER ROBERTS: It's in the process you're starting with similar products. And that's where the --

MANAGER MITCHELL: Transetherification is the chemical process for producing biodiesel and hydro treating is the chemical process for producing renewable diesel.

BOARD MEMBER ROBERTS: You made it so crystal clear.

CHAIRPERSON NICHOLS: The whole concept of fatty acids is not really worth talking about.

BOARD MEMBER GIOIA: There is a good band name in there somewhere.

CHAIRPERSON NICHOLS: With that, I think we should proceed to hearing from the witnesses. So we'll start with Matt.

MR. MIYASATO: Thank you, Madam Chair.

For the record, Matt Miyasato, the Deputy Executive Officer for Science and Technology Advancement

at the South Coast Air Quality Management District.

I'm here to voice our support for the staff recommendation and your ultimate approval of the ADF regulation.

I also want to point out that you've heard a lot of accolades about your staff. They continue to work, go out of their way to work with us. We brought up the concerns we had over NOx increases or potential for NOx increases. And they do what we do, they rely on data to make the recommendations before your Board which is in your package today. So we appreciate staff continueing to work with us.

So again, we urge your ultimate approval when this comes before you for a vote. Thank you.

CHAIRPERSON NICHOLS: Thank you. Ms. Case.

MS. CASE: I'm going to sound like a broken record when I thank everybody again.

CHAIRPERSON NICHOLS: Could you raise the mike?

MS. CASE: Richard Corey and Lex Mitchell and everybody on the staff for all the work that they've put into this, because it really has been a lot of work. And I do appreciate it.

As I said in my earlier testimony, my biodiesel plant is in San Diego, which is one of the smaller diesel markets that is not at this point terminal blending. We

make our biodiesel from 100 percent used cooking oil captured from restaurants. So we convert french fry oil into biodiesel.

The biodiesel that we make on the our plant is one of the lowest carbon biodiesels out there, because we are making it from the used cooking oil. And it's soon to be lower as we are in the middle the project to install cogeneration at our plant, which we are really proud of.

This regulation I know was pain-stakenly arrived at over a long period of time, and I believe it represents a great compromise for all sides. I particularly support that there is the in-use time line, which will allow our business to adapt. We do sell a lot of our fuel into the B20 market. So we do need to make some changes to our business plan. And we look forward to continuing to work with staff on finding ways that we can target fleets that will not cause increased NOx and in addition work with our trade industry group on developing additives.

So thank you for everything that you've done to get to this point. And in this spirit of the Chairman's comment earlier, I'm very confident that we will innovate and adapt to these changes as we have in the past and everyone should to protect our environment. Thank you.

CHAIRPERSON NICHOLS: Okay. Thank you.

Curtis Wright? Curtis Wright here?

Celia DeBose.

MS. DE BOSE: So this is Celia DeBose again with the California Biodiesel Alliance, the industry trade association representing over 50 stakeholders.

And again, we're supporting the comments of the National Biodiesel Board and urging the adoption of this regulation. So if staff needs more kudos, kudos.

And the interesting thing about this is that it's not just you guys, but it's generations before because we really have been working on this for about ten years. What we've been engaged in is a process of bringing in new fuel to market in California. So we've marked with State agencies, helped them check off what they need to check off. And what's important now is that the Air Resources Board moved forward with this important step so that we can move forward with a structure and a process that allows us to deal with this one criteria pollutant.

So we really appreciate the exemption, the exemption for the 90 percent new technology diesel engines for heavy-duty fleets, the exemption for the light and medium duty fleets, the opportunity to create our own additive. And I was very happy to see further blend level flexibility for captive fleets as something that we can talk about. So thank you again. We really look forward to continued engagement as we finalize and implement this.

Just on another note, it's great to have our fuel recognized for its beneficial qualities. And we know that we do well under the low carbon fuel standard because we reduce greenhouse gases. But it's nice to hear you guys also recognize all the other benefits. We really look forward to bringing the health benefits to California as much as possible and especially the PM reductions that have been really noted -- Richard Corey mentioned this at our conference on February 4th saying that biodiesel is important for reductions in toxic diesel particular matter. So we do this already. We want to do it more. We want to help provide solutions in the communities that are most impacted that suffer the most from the diseases caused by diesel pollution. And a lot of our plants are located in these areas. So we're going to accomplish this by creating more good family supporting jobs. So thank you guys so much.

CHAIRPERSON NICHOLS: Thank you.

MR. NEAL: Thank you, Madam Chair and members of the Board.

Shelby Neal with the National Biodiesel Board representing the biodiesel and renewable diesel industries. We are not quite as excited to be headed to the gallows as the gentleman was this morning. But we are never the less excited.

We would like to thank the ARB Board and especially staff and particularly Richard Corey for really in my 17 years in and around government unprecedented level of focus and work on an extraordinarily dull topic. So thank you really all of you for doing that.

I'm no expert in business, but Warren Buffet it often says this, he says capital goes to where it can get the highest return with predictable risks. So it's the last clause in that sentence where we've had trouble. Predictable risk. But this regulation along with LCFS readoption fixes that.

So this should move our industry from survival mode, which is surviving is better than the alternative, but it's no way to live long term. So this should move us into a more comfortable area. And in 2023, or when we can develop an additive so-called solution which we are working on already, we can thrive and we can flourish in the state. I think we will.

I want to thank ARB staff for just doing an incredible job. We stated in our public comments that we didn't think this regulation was necessary in a perfect world. But that's not intended to be a criticism. ARB has a very different mission than our industry does or other scientists who look at this. And every step they took the most conservative path, the most protective of

public health. We support that view. That's why we willingly accept these limitations. Thank you very much for your time.

CHAIRPERSON NICHOLS: Mr. Teall.

MR. TEALL: Russ Teall, Biodico and currently President of the California Biodiesel Alliance.

I will try not to repeat the things that have been already said. I agree with them entirely.

But the history of this goes back to 1993. That was our first meeting with the Air Resources Board to talk about biodiesel. It was brand-new at the time. And so it's been a 22-year journey up to this point. And is it perfect? It's as close to perfect as you can get. There's been a lot of give and take, back and forth. And the complexity of the regulation reflects a desire I think to get it right. You know, it's a complex topic. And in order to balance the needs of industry with the needs of the environment, I think it's a well crafted decision.

One point that needs to be made is that biodiesel substantially reduces air toxics, other than the criteria pollutants, all the polyaeromatic hydrocarbons, et cetera, we're the only fuel that's been through Tier 1 and Tier 2 health effect testing the U.S. EPA successfully. So that's a point that was recognized by staff.

Thirteen public meetings, seven ADF workshops,

countless private meetings, phone calls, e-mails, I'm going to look forward to getting back to Santa Barbara at the end of this journey.

Other than thanking Richard, Floyd, and Jack have done a tremendous job, you know, transitioning Floyd in the beginning directing this entire process, setting a mood that was correct in terms of listening to industry, reacting. And I think as a two-way learning, we learn things along the way that about ARB and what the objectives are. And I think they learned as well.

So I guess in conclusion, we whole heartedly support the ADF program in part because of staff. You know, we know that staff is there. They're listening. And we look forward to continuing the dialogue during this 15-day notice period. Thank you.

CHAIRPERSON NICHOLS: Thank you.

Mr. Von Wedel.

MR. GERSHEN: I think Randall left.

Thank you again. At the risk of sounding a little repetitive, the development of this ADF regulation has been a challenging process. We appreciate ARB has been mindful of all the stakeholder interests.

As I'm sure you know by now, California biodiesel industry is made up of independent producers marketers, feedstock suppliers, a variety of stakeholder feedstock,

all sizes and shapes. A big challenge has been to be inconclusive, and ARB staff has been very attentive to our needs and demonstrating the willingness to work with our industry to help develop a variety of compliance options. And we really do appreciate that. Thank you.

As mentioned in my prior comments, I'm confident that working together with ARB, California biodiesel can build on our successes. We look forward to continue working with you even more to reducing carbon emissions, lowering emissions, and creating high paying green jobs in disadvantaged community across the state. Thanks.

CHAIRPERSON NICHOLS: Lisa Morenton again.

MS. MORTENSON: Hello, Chairman Nichols and members of the Board.

I sincerely appreciate the opportunity to talk about the ADF. This is a very personal issue for me. I cannot count the number of sleepless nights that I have had during the twists and turns of the development of the ADF rulemaking. So this is very important to our industry.

As you know, biodiesel use in California has made a positive impact. It reduces harmful emissions and it also stimulates the economy. It's important to remember that biodiesel is an advanced biofuel that is proven. It's reliable. And it is available in commercially

significant volumes. And it is our commercial success is why we are in the Stage 3 as a commercial fuel under the ADF rulemaking. So part of this is very positive. The commercial success of biodiesel have moved us into this new level of regulation.

Biodiesel does have strong public and bipartisan support, and that's because it has so many terrific benefits. It has wonderful performance benefits. It has very strong lubricity properties, which reduces wear and tear on engines, and it also has strong detergent properties.

It has terrific environmental benefits reducing harmful emissions which improve human health. And we heard from Lex Mitchell earlier that biodiesel lowers localized toxic exposure. That is so important to protect our most impacted communities. And it's also important to remember that the diesel engine is 20 to 30 percent more efficient than electric engine.

And we, of course, can't forget the economic benefits. Biodiesel creates jobs, revenues, and taxes. When you have in-state production such as what we do at Community Fuels, you're creating advanced manufacturing jobs, which have the highest multiplier effect of any industry. So biodiesel is really exciting and really good for California.

I ask you to put on your imagination cap and imagine if biodiesel were the typical diesel fuel used in California and petroleum diesel were trying to gain approval. Imagine how different that conversation would be.

We spoke about how biodiesel is ready to deliver significant volumes to California. The ADF proposal will impose limitations and constrain how biodiesel is used within the state. While I understand why the alternative diesel fuel rulemaking is necessary, I do request that CARB pay very close attention to this ADF rulemaking and to work hard to sunset this regulation at the earliest possible opportunity.

We want to grow biodiesel in California. We want to realize all the benefits that biodiesel has for this state. And to do that, we need more flexibility and higher volumes of biodiesel. And just quickly, I want to thank Mr. Corey for his personal involvement in this very important issue. He made a big impacts in the direction of this regulation. Thank you.

CHAIRPERSON NICHOLS: Okay. Thank you. Extra time always allowed for thanks.

MR. SIMPSON: Madam Chair and members of the Board. Harry Simpson with Crimson Renewable Energy, biodiesel producer here in California.

Obviously, we paid very close attention over this marathon process that we've gone through in getting to where we are today with the ADF regs. I think in our company was formed in '07, and I think some of the stuff started even before that.

So we would certainly like to thank Mr. Corey and Lex and Floyd and the many others who have been on this road to get us to the proposed regs today.

I know that sounds like a broken record, but you guys really do deserve a hand for that. You guys have consistently engaged with all the different stakeholders and that was certainly no easy feat. And your willingness to do it on a very regular basis and hear what everyone had to say went to I think what many of us would call a grand compromise in terms of the regs that we have before us today.

That compromise was the product of a lot of strong data, a lot of technical analysis, a lot of fighting back and forth as to how that shook out. In the end, I think you were able to acknowledge the significant health and carbon reduction benefits that biodiesel offers and reconcile that with any issues and the need to safeguard air quality in terms of NOx.

So while it's not ideal, we fully support it. And I think it provided much needed regulatory certainty.

Like Lisa said, I, too, have had many sleepness nights wondering if the close to $30 million we have invested in our plant is going to go up in smoke. And we get essentially regulated out of business.

So I'm happy to say that's not the case, and I think the community in which we in the state of California I think last year we contributed about $40 million directly into the economy. When we're done with our expansion, it will be $80 million in 2016. It's good to see that investment will continue to make a contribution and bring much needed carbon reduction benefits to the LCFS. Thank you. We support the regs.

CHAIRPERSON NICHOLS: Great. Mr. Barrett.

MR. BARRETT: Good afternoon. I'm Will Barrett with the American Lung Association of California.

And as noted in the letter that we submitted along with our colleagues that CERT, the Coalition for Clean Air, NRDC, we support the proposed diesel regulation. You'll hear from some of the other signors of that letter in a few minutes.

We believe the proposal successfully addresses the need for cleaner alternatives to harmful fossil fuels, with the need to ensure that no additional harm is caused by these alternatives as they come into the market or the market expands because of the potential for biodiesel to

increase smog-forming NOx emissions under certain formulations or engine models or operating conditions put forward by CARB set to avoid backsliding on NOx is appropriate.

We also do appreciate that the proposal and Lex's presentation included compliance strategies to maximize the greenhouse gas and particulate benefits of buy diesel. We encourage ARB to explore additional opportunities to capture NOx neutral and NOX reducing particulate and carbon pollution benefits of this alternative.

The air pollution public health and health equity impacts of petroleum fuels are well documented and must continue to be addressed through strong regulations that get all fuels impacts on lung health in our climate. We believe the ADF proposal is an important step in this process of curbing many harmful pollutants at once and protecting the health of future generations of Californians. So I just wanted to add to the chorus and thank for the staff's work on this. And thank you all.

CHAIRPERSON NICHOLS: Great. Mr. Magavern.

MR. MAGAVERN: Bill Magavern, Coalition for Clean Air in support. I did not go through all the ins and outs of this long regulatory process. I have a lot of respect for those who did. I'm very impressed with the final result.

For years, we've had this tension. I think as we heard earlier today just, about everybody other than the oil companies wants to bring lower carbon fuels to market. And we need to reduce our reliance on petroleum so there are a lot of good arguments for alternative fuels.

At the same time, as air advocates, we want to make sure we're not unintentionally increasing any air pollutants. And of course, it's your mission to prevent that from happening. So I think that this balance has been struck and this regulation really achieves that. Petroleum diesel is a plague on our health, so let's bring on the biodiesel with the appropriate protections. Thank you very much.

CHAIRPERSON NICHOLS: Okay.

MR. DELAHOUSSAYE: Good afternoon. Dayne Delahoussaye representing Neste Oil. Neste Oil support supports the ADF regulation and and we're advocating the Board continue forward with it.

We're glad and proud that the findings of the NOx reductions agrees with our research and our experience as well. So we are supportive of California moving forward with that step.

The one technical comment I would point out and I made this in more detail in my written submissions for both the LCFS and the ADF because they tie together is the

definitional language specifically when you're discussioning this fuel.

I believe one of them calls them non-renewable diesel. The other calls it renewable. At a minimum, encourage the same terminology for both of these funds referring to the same fuel.

Additionally, the ADF goes into great pains to describe -- the fuel they described was the hydrocarbon fuel. And so we would encourage as we're trying to develop a right technology for this and consistency that renewable hydrocarbon diesel be the term we're describing so we can avoid any confusion between different usage and different markets of other uses and that kinds of stuff. For example, some Canadian jurisdictions define renewable diesel as both hydro treated and biodiesel stuff. I think having a more clear definition of what it is renewable as opposed to what it's not non-ester renewable diesel being a more appropriate and simple definition for that kind.

And as well as then align the two definitions. They both have different public parts and things like that and there is a lot of overlap, but they're not unanimous. I would encourage being at least under the same division to have a definition that is in line and in agreement with each other. And you don't have two jurisdictions within the Air Resources Board playing that game. Other

questions, I'm happy. Otherwise, thank you for your time.

CHAIRPERSON NICHOLS: Good point. Probably requires the equivalent of a spell check to be used. And make sure we use the same terms each time. Okay.

Mr. Hedderich.

MR. HEDDERICH: So 13 is much better than 45 or 46. Moving up in.

And I understand why, Chair Nichols, you pronounced my name correctly. It's misspelled. It ends in an H.

I'm not going to repeat the comments you heard from other folks. We're very supportive as the nation and north America's largest biodiesel producer and also a significant producer of renewable hydrocarbon biodiesel. Very supportive of all the comments that you heard. Agree there is some definitional issues we need to work out to make sure we're using the same language.

I was going to offer to Supervisor Roberts if he wants to see what the different plants look like, happy to show him. This has been a torturous process, I'll say. It needs to come to conclusion so our industry can move forward, so we can move forward with the LCFS, so we can have some certainty. Very much appreciate all the effort that staff did to bring this issue to closure. And with that, let's move forward and get closure. Thank you.

CHAIRPERSON NICHOLS: Okay. Thank you.

Mr. Mui.

MR. MUI: Good afternoon. Simon Mui with NRDC.

We also support the adoption of the ADF regulation. And like Bill Magavern, I've been on the periphery and following and reading.

But I do have to commend staff and management for really balancing the need to achieve the GHG reduction goals while mitigating any NOx issues. And we do think that ARB -- this is one great example where ARB has really ensured as we transition to new energy sources, we are managing the trade-offs.

So I really commend staff. And I know that often times industry may have sleepless nights. I can guess that ARB and staff has had sleepless nights. Maybe as a Resolution Richard can actually take a weekend off.

But I do want to say that this is reasonable. Our understanding is looking at the science that this is based on the best available technical studies and work. And we are very enthusiastically supporting this as maximizing both the LCFS and ADF together are really maximizing the public health benefits of these programs. Thank you.

CHAIRPERSON NICHOLS: Thank you.

And last, Mr. Fulks, from the Diesel Technology

Forum.

MR. FULKS: Madam Chair, Board members, always awesome to be batting cleanup, standing between you and going home. So I will be as brief as I possibly can.

The Diesel Technology Forum is not taking a position on ADF, but we did want to come in and acknowledge the professionalism, the courtesy, and the just plain decency of your staff in the development of not just the ADF, but also the LCFS. It's been a pleasure to work with your staff. I'm just piling on, I know.

I did want to take a yellow highlighter to the precedent-setting policy that you were engaging here with the ADF in that it is an acknowledgement that emission control systems for diesel engines will be used as a NOx mitigant for this fuel moving forward after 2018.

We did note that under the LEV III development process the notion of using fuel as a NOx mitigant for vehicle hardware was never even allowed to be considered. So this is a precedent-setting policy change that we will be taking note of as we move into the future trying to reach the Governor's 50/50/50 by 30 goals. We're going to be relying on diesel for a while to get some of these fuel economy gains.

And as there may be a clash between those goals and the ultra low NOx rule that is a voluntary rule now

but may be coming back to you as a mandatory measure. So therefore, I just wanted to plant the seed that now that the precedent has been established that you can use hardware to mitigate NOx from fuel, it may come back to you some day that maybe perhaps we can consider using fuel as a NOx mitigant for hardware down the line.

So thank you for your attention. And again tip of the hat to your staff.

CHAIRPERSON NICHOLS: Well, it's an interesting comment, but I'm not really buying it.

MR. FULKS: I'll put it in the record anyway.

CHAIRPERSON NICHOLS: I'll tell you why, because I think that there is a lot of precedent for recognizing that emissions occur when fuel is used in an engine. And when you're projecting emissions, you have to look at what the engine is doing as well as what the fuel is doing.

So I don't think that position that the staff has taken here -- and I could be corrected on this -- is that the new vehicle standards are a mitigation for the fuel any more than the fuel is a mitigation for the engines when we're certifying engines. We certify engines based on a type of fuel that we assume is going to be in the marketplace. And this is the same thing in reverse.

MR. FULKS: Understood. We wanted to open the dialog as we move forward with ultra low NOx.

CHAIRPERSON NICHOLS: Always good to see you. Mr. Corey needed another round of thanks. That's great. Thank you.

Okay. That's it for the witness list. And are there any additional comments by the Board? Question, Mr. Dr. Sperling.

BOARD MEMBER SPERLING: I'm not speaking as a Board member yet. As a scientist, I look at Table 12 and I see these are really very small differences when you take into account we're talking about 50, 90, 95 percent reductions otherwise. So are there -- there's uncertainty. There has to be a lot of uncertainty here. So I'm wondering if I was looking as a scientist, I would say, okay, what are the confidence intervals here. What's probablistically, what are we talking about here. But one percentage? Two percentage? I know there is judges involved and that stuff. So that's why you I'm asking this as a scientist first.

MANAGER MITCHELL: I can parrot some of what we put in the staff report. We did do an ARB staff level statistical analysis and we commissioned a statistical analysis from an independent researcher, and they both found basically that we've got these results are statistically significant.

BOARD MEMBER SPERLING: At what level? At 90

percent?

MANAGER MITCHELL: Generally, we look if you want to, P values of .05 or less.

BOARD MEMBER SPERLING: Yeah. Okay. I had to ask that.

CHAIRPERSON NICHOLS: What does that lead you to think?

BOARD MEMBER SPERLING: That it's unfortunate we got to put it. We created this complex set of rules and, you know, burdens on companies. And it's a small effect. And I know, you know, we don't want to be -- our goal is to reduce NOx, not to increase it. But it really is a tiny amount, and it's not even relevant to anything except old engines. We've created this complex rule. So I'm kind of holding my -- I'm trying to accept it because I know we need to do it or that's my understanding because of lawsuits. But as public policy, it's kind of questionable.

CHAIRPERSON NICHOLS: Well, it's what happens when you get mixed up with CEQA.

BOARD MEMBER SPERLING: I know. That's why I don't want to be part of the next lawsuit either.

CHAIRPERSON NICHOLS: But it is -- isn't just lawsuits. But it is the law actually that requires that we be able to say with more certainty than you might like

that it will not be an increase in NOx as a result of what we're doing. That's a hard thing to prove, I know.

BOARD MEMBER SPERLING: I'll say one last thing. You could look at electric vehicles and say some -- I'm not going to go there.

CHAIRPERSON NICHOLS: You're not going there. You can think whatever you like.

Ms. Mitchell.

BOARD MEMBER MITCHELL: Thank you.

I also wanted to thank staff for working on this. And Jack Kitowski, I know he put a lot of time in it. And as you all know for South Coast, it's really important that we prevent further NOx -- increases in the NOx emissions. We have a fairly daunting task ahead of us for 2016 AQMP and our reductions that are needed by 2023 and 2032. I talked about it many times sitting on this Board. So this was a hard thing to do.

It does result in some complexity, but I think staff did a really good job working it out. And I know they worked very closely with staff at South Coast to iron out all the little wrinkles in this to get to a point where it's acceptable and will help South Coast reach the targets that we have to reach. So thank you for all the work that you've put in on it.

CHAIRPERSON NICHOLS: Thank you.

BOARD MEMBER BERG: I'd like to just make one observation as I was listening to the testimony and the regulated community, it really came to mind as I look at this and saw all of the support and the accolades for staff, but actually the accolades for the industry, because I did hear how challenging -- it was a marathon. It was torture. It's not ideal. It caused sleepless nights. And then from the environmental of our NGO friends that, you know, the tension of finding balance, the managing of trade-offs. And all of this very rarely produces a public testimony sheet of all support. And it made me think, you know, a roomful of an entrepreneurs and a roomful of people that really want to get the job done, this is what it looks like. So congratulations.

CHAIRPERSON NICHOLS: Okay. With that, did you properly close the record or did I never do that? Well, I should have.

The record is closed for this agenda item, but again, it's going to be reopened when the 15-day notice of public availability is issued.

So once again, we will not be receiving comments after today on this item. But after the 15-day notice there will be an opportunity for comment on the 15-day notice items. And they will be responded to in the Final Statement of Reasons for the regulation, which will also

come back to the Board. And we're planning on doing these again in tandem so this rule accompanies the low carbon fuel standard rule and that will keep everything neat. So we have a before us resolution Number 15-5. And do I have a motion?

BOARD MEMBER BERG: So moved.

BOARD MEMBER SHERRIFFS: So moved.

BOARD MEMBER RIORDAN: A second.

CHAIRPERSON NICHOLS: A second, Mrs. Riordan.

All in favor, please say aye.

(Unanimous aye vote)

(Dr. Balmes not present at vote)

CHAIRPERSON NICHOLS: Any opposed? Any abstentions? Okay. Great. Good work.

This really is a culmination of a lot of work, but it isn't over. There's more still to be done. But we're well on our way. So thanks to all. Before we can adjourn, we do have to make time for any public comment. There's no general public comment today. All right. Then we are adjourned.

BOARD MEMBER GIOIA: Chair Nichols, I certainly would be remiss given the team of today's hearing thanking Mr. Corey on several accounts. I want to add to that at the previous meeting last month staff gave a very detailed presentation on our 2015 priorities which I think we all

appreciated.

I made the comment after the presentation and I think it was some public testimony that it would be nice to see some accounting of what we are doing to advance environmental justice kind of cross-pollinated across all the programs and rulemakings and the policies that deal with the Air resources Board. I just wanted to thank them because I'm in receipt of a slide he took it very seriously and sent me a slide doing exactly what I had suggested.

So I wanted to thank you, Richard, for doing that and I think it demonstrates how serious not just Richard but all of our staff take that particular aspect of what we do here.

BOARD MEMBER GIOIA: Can you send that slide to all of us, Richard?

EXECUTIVE OFFICER COREY: Will do. It will be posted as well.

CHAIRPERSON NICHOLS: Oh, good. Everybody will be able to take advantage of it. Thank you all. Safe travel.

(Whereupon the Air Resources Board adjourned at 4:06 p.m.)

CERTIFICATE OF REPORTER

I, TIFFANY C. KRAFT, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing hearing was reported in shorthand by me, Tiffany C. Kraft, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 4th day of March, 2015.

TIFFANY C. KRAFT, CSR, RPR
Certified Shorthand Reporter
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