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CALIFORNIA ENERGY COMMISSION

STAFF WORKSHOP

In the Matter of:	) Docket No.
	) 15-ALT-01
	)
	) Meeting and Public
	) Workshop RE:
	) Alternative and
	) Renewable Fuel and
2016-2017 Investment Plan Update	) Vehicle Technology
_____	) Program

CALIFORNIA ENERGY COMMISSION

THE WARREN-ALQUIST STATE ENERGY BUILDING

FIRST FLOOR, ART ROSENFELD HEARING ROOM

(HEARING ROOM A)

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

FRIDAY, NOVEMBER 6, 2015

10:00 A.M.

Reported By: Kent Odell

APPEARANCES

Commissioners

Janea Scott, Lead Commissioner for Transportation

Advisory Committee Members (* Via telephone and/or WebEx)

Steve Kaffka, University of California Davis

Claire Jahns, California Natural Resources Agency

Jack Michael, Recreational Boaters of California

Sekita Grant, Greenlining Institute

Howard Levenson, CalRecycle

Peter Cooper, California Employment Training Panel

Ralph Knight, Napa Valley Unified School District

Brian Goldstein, Energy Independence Now

Erik White, California Air Resources Board

Tim Carmichael, California Natural Gas Vehicle Coalition

Joe Gershen, California Biodiesel Alliance

Chris Shimoda, California Trucking Association

Bonnie Holmes-Gen, American Lung Association

*Eileen Tutt, California Electric Transportation Coalition

*Simon Mui, National Resources Defense Council

*John Shears, Center for Energy Efficiency and Renewable Technologies

APPEARANCES (Cont.)

Staff/Presenters

Jim McKinney, ARFVTP Program Manager CEC

Jacob Orenberg, Zero-Emission Vehicle and Infrastructure Office CEC

Andre Freeman, Emerging Fuels & Technology Office CEC

Randy Roesser, Fuels and Transportation Division CEC

Others Present (* Via telephone and/or WebEx)

James Boyd, Clean Tech Advisers (former CEC Commissioner)

*Dr. John Reed, North American Repower

*Urvi Nagrani, Motiv Power Systems

*Erin Evans, Small School Districts Association

*Stephen Ptucha, Cummins Westport

Joe Pride, Wooster Engineering & Stone Edge Farm Microgrid Project

Peter Ward, Alternative Fuels Advocates, LLC

Vincent Wiraatmadja, BYD Motors Inc

John Brauer, California Labor Federation

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P R O C E E D I N G S

November 6, 2015 10:02 a.m.

MR. ORENBERG: . . . also lastly, in the event of an emergency and the building is evacuated please follow our employees to the appropriate exits. We will reconvene at Roosevelt Park, located diagonally across the street from this building. Please proceed calmly and quickly, again following the employees with whom you are meeting to safely exit the building.

Also, if you would like to make a public comment during this workshop we do ask you fill out one of these blue cards and you can hand them to me. Thank you.

COMMISSIONER SCOTT: Thank you very much, Jacob.

The blue cards are kind of up front on the table as you walked in just in case you didn't see them.

So I'd like to say good morning and welcome to everybody. I think I know most of the folks around the room, but for those of you who don't know me I am Janea Scott. And I'm the Lead Commissioner on Transportation here at the Energy Commission. And so I just want to warmly welcome everyone and say thank you to you for spending time here with us this morning.

Before we get started I just wanted to highlight a few things that have taken place since our last Advisory Committee Meeting. Most of you are probably well aware of

this, but thought I'd highlight it anyway. As you all know, earlier this year Governor Brown set an ambitious goal of reducing the State's greenhouse gas emissions to 40 percent below 1990 levels by 2030. And to help us get there he called for, among other things, a 50 percent reduction in petroleum use by California's transportation system by 2030.

Additionally, in July 2015 the Governor put out a Sustainable Freight Executive Order calling for multiple state agencies to collaborate on the development of an Integrated Action Plan that establishes targets to improve freight efficiency, increase adoption of Zero Emission technologies and increase the competitiveness of California's freight system. Our Alternative and Renewable Fuel and Vehicle Technology Program or ARFVTP -- you'll see that acronym everywhere -- is helping to fund that transition of California's transportation fleet to zero and near zero emissions fuels and technologies. And we will continue to be an integral part of helping to achieve the Governor's goals.

It's critical that we are very strategic and wise about how we invest our program funds. And to do that, it is important that we have the most recent and up-to-date information as decisions are being made. For that reason, I'd really like to give special thanks to our Advisory

Committee members sitting around the table here with me who continually share their knowledge and expertise as we develop Investment Plans for ARFVTP.

To reflect on some of the accomplishments of ARFVTP we've invested about $580 million in over 495 projects throughout the state. We've had numerous successes and most recently we're really excited about the USEPA and Air Resources Board certified Cummins natural gas low NOx engine, which reduces the exhaust emissions to 90 percent below the EPA's current NOx limit while meeting the EPA's 2017 greenhouse gas emission requirements. We're especially excited about that, because this is an engine that was originally demonstrated as an ARFVTP project.

This year we also initiated an Energy Commission ports collaborative effort in which we have engaged a number of ports throughout California to gain a better understanding of the barriers they face in reducing the emissions resulting from their daily operations.

As you all know, California's freight industry accounts for about 30 percent of the State's economy, but it's also responsible for 45 percent of the NOx emissions and about 6 percent of the greenhouse gas emissions in California. So we're working with the ports to understand how we can help clean up the freight sector. And that's something that we're really excited to focus on with our

partners in the ports this year.

I'm also happy to announce that this year we initiated an annual merit review process in which we bring in previous ARFVTP recipients to provide insights and guidance on improvements we can make for going forward and for future ARFVTP projects. It really gives us a chance to kind of do a deep dive into some of the projects and understand how they have the potential to help with clean air goals and with climate goals.

So those are just a couple of the highlights that I wanted to mention to you all before we jump into today's presentations. But before we do that let's go around the table and do some introductions. And as we're doing that, I would really like to highlight and point out for you all we have two new members on the Advisory Committee.

And I just want to extend the warmest welcome to Claire Jahns from the California Natural Resources Agency. She's over there. And also to Sekita Grant from the Greenlining Institute. We're just delighted to have you as members of the Advisory Committee.

So let's go around and do introductions. Jim, you want to start?

MR. MCKINNEY: Jim McKinney, ARFVTP Program Manager.

MR. ROESSER: Randy Roesser, Fuels and

Transportation Division Acting Deputy Director.

MR. KAFFKA: Steve Kaffka, University of California Davis.

MS. JAHNS: Claire Jahns, Assistant Secretary for Climate Issues at the Resources Agency.

MR. MICHAEL: Jack Michael, representing Recreational Boaters of California.

MS. GRANT: Sekita Grant, Legal Counsel with Environmental Equity at the Greenlining Institute.

MR. LEVENSON: Howard Levenson, Deputy Director of CalRecycle.

MR. COOPER: Peter Cooper, Assistant Director at the Employment Training Panel.

MR. KNIGHT: Ralph Knight, Napa Valley.

MR. GOLDSTEIN: Brian Goldstein, Executive Director of Energy Independence Now.

MR. WHITE: Erik White, I'm Chief of the Mobile Source Control Division at the Air Resources Board on behalf of Dr. Alberto Ayala.

MR. CARMICHAEL: Good morning, Tim Carmichael with the California Natural Gas Vehicle Coalition.

MR. GERSHEN: Good morning, Joe Gershen with the California Biodiesel Alliance.

MR. ORENBERG: And Jacob Orenberg, the Project Manager for the 2016-2017 Investment Plan Update.

COMMISSIONER SCOTT: Terrific. Welcome everyone.

I'd like to remind you we have folks that are on the WebEx who are also participating, so if you will remember when we get to the discussion part to say your name before you speak I think that'll help folks on the phone and WebEx follow along with us.

Let me turn it now over to Jim McKinney who's going to give us a PROGRAM STATUS UPDATE.

MR. MCKINNEY: Great. Thanks very much, Commissioner Scott.

So again on behalf of the Energy Commission and Energy Commission staff, welcome to all of our Advisory Committee members here this morning and to our stakeholders here in the audience.

One other thing I wanted to check with Andrew, do we have any Advisory Committee members that are participating remotely?

(No audible response.)

MR. MCKINNEY: Not yet, okay great.

Let's see and then Mr. Roesser, who's trying to kind of look subtle there in his red shirt at the corner of the table, he has been our Acting Deputy Director for this year. And I think, Randy, this will be your last Advisory Committee meeting, right?

MR. ROESSER: (Indiscernible)

MR. MCKINNEY: Yeah, okay. So it's really been a great ride working under him. He's really brought a lot to our program, so glad you're sitting here today Randy and we're going to wish you well and miss you.

With that, let's see here we go. Okay. Here is this morning's agenda, so we're in the introduction, opening remarks, program status report. I'll give a presentation kind of bringing you all up to speed on what we've been doing with the public money, where we are, what our goals are.

Then Jacob Orenberg, who has taken over from the very capable Charles Smith, will give us the staff presentation of the Investment Plan and the staff arguments and rationale for the different funding recommendations.

After that we'll turn to the Advisory Committee for discussions. And we'll just go line by line down the funding chart. We'll have Committee discussion and then Committee discussion on the phone and then stakeholder discussion here, stakeholder discussion on the phone. Lunch and then we'll continue discussion and then close with any last public comments.

Let's see, Chris would you like to introduce yourself real quickly before I get going?

MR. SHIMODA: Yeah, Chris Shimoda, Policy Director for the California Trucking Association.

MR. MCKINNEY: Great, welcome Chris.

So with that when we talk about the program status and how we use the $100 million in public funds each year it's always a good reminder to note the scale of what it means to have -- to be doing this in the context of the 8th largest economy in the world and our just massive transportation system here in California.

So we have over 28 million vehicles, nearly 1 million trucks and we continue to consume very, very large volumes of fuel. And as you can see about 18 billion gallons total, the gasoline figure includes some ethanol as well. And over 170,000 in primary roadways, so while the numbers from ARFVTP are moving off of zero and starting to move up we still have a long ways to go to get to where we need to be in the low-carbon transportation future.

For ARFVTP, this was originally done under AB 118 back in 2007. The way this program works is that there's a small surcharge on everybody's vehicle registration fee and smog abatement fee. About 100 million of that a year come to the Energy Commission, another 30 million a year goes to our partners at the California Air Resources Board for the Air Quality Improvement Program.

The amount coming to the Commission at the end of 2023 will total about $1.5 billion. We think the Air Board will get another half a billion dollars on that, so that'll

total about $2 billion in public investment in these technologies and fuels and vehicles when the program sunsets.

Commissioner Scott already went through a lot of the policy objectives here, so I think we're familiar with them now. And I just would like to note that when I understood that Governor Brown was meeting with the Pope in the Vatican and they talked about climate change, it just kind of jarred my world. I mean, I think it's just amazing what our Governor is doing. And then he'll be representing California at the Paris Climate Negotiations in December as well. So it's an amazing opportunity to work under administration that takes climate change and greenhouse gas reduction emissions so very, very seriously.

This is a schematic that shows how our program works. So we get our Investment Plan initial allocations -- that's where we are today. Those then translate into solicitations and that's really where we kind of take an aggregate set of policy directions and funding amount and translate that into a specific solicitation. So we can do solicitations and then interagency agreements.

That is a very competitive process, the proposals are received, screened, reviewed, ranked. And then we make a decision on what we call the NOPA, Notice of Proposed Agreement, and then those translate into individual

contract agreements. Typically, we have two years to encumber the money and grantees get four years to use it. With the hydrogen system it's a little different, we now have a four plus four funding situation there.

So this is where we are today. As Commissioner Scott said we're coming up on the $600 million mark in public investments through ARFVTP, so this is about 50 million more than we had when we last met in February in Fresno for the previous funding plan.

You can see the percentages here, so electric drive continues to get about a third of our funding, biofuels a little over a quarter, hydrogen and natural gas are getting about 17 percent, workforce development and then program development as well. So we're coming up on 500 total projects. And again, it's really exciting, because the needle is not kind of at zero anymore. We're starting to see some demonstrable changes in our system.

So this is a little more information and I'm going to go through each of these kind of primary funding categories in more detail. But for fuel production, you can see that biodiesel and biomethane are predominant fuel categories for that. Ethanol's got a little bit.

For fueling infrastructure hydrogen is starting to become kind of the predominant fuel category there. Electric drive, of course, is incredibly important. Some

to ethanol, E85, a little bit to biodiesel and a little bit to natural gas as well.

On the vehicle side it's about an even split between electric drive and natural gas. Most of these are in the medium duty and heavy-duty truck sectors, so we put a lot of money into electric drive medium duty, heavy-duty technology demonstrations. And as those technologies mature they're eligible for the HVEP (phonetic) funding program at the Air Resources Board.

For manufacturing that's primarily electric drive and most of that is trucks and buses here in California and again, in workforce and a few other parts.

This is how the funding is distributed by Air District in California. So the way to read this chart is what you would like to see is that the percent of total funding and percent of state population are roughly equivalent, so that is for the Bay Area.

Monterey is about the same.

The San Joaquin Air District has got about 10 percent of our state population; they're getting about 14 percent of our funding. South Coast, Madame Yousetta (phonetic) likes to remind me that these funding figures for South Coast are not right, but they do get the lion's share of the funding here given the size of the population and the severity of the air quality issues down there.

And then we have other Northern California, the smaller air districts, smaller grants, Southern California, and then about a quarter of our projects kind of work at the statewide basis. So these can be multi-project awards for electric vehicle charging infrastructure, natural gas truck deployment, E85 retail ethanol stations and that type of thing.

I'm going to turn now to electric vehicle infrastructure and support. So we recently kind of crested the $40 million mark for investments here. I would like to recognize Thanh Lopez and Brian for the amazing work they've done in really cleaning up our data sets. We actually know now where all of our chargers are and exactly what was going on with some of our big multi-million dollar awards earlier on. We didn't have really good as-built data. We now have that.

So we've now funded 7,500 total chargers and you can see about 6,000 of those are installed. We started out with an emphasis on the residential program and realized that that market was firming up pretty quickly. The charger costs are coming down, so people can handle that more or less on their own.

Multi-unit dwelling is a huge emphasis for us given the number of Californians that live in apartments or condominium blocks in our urban areas.

The commercial space is important too, 2,800 there.

The workplace area is emerging as a very important place to put EVSC. We've seen some good data where if you put enough chargers in, in a few key large work areas, you'll actually see an uptick in EV sales in that same region.

And then our D.C. Fast Charger investments are coming along very well as well. We're going to have a 120 of those. They take a little bit longer to install.

Thirty-four regional readiness grants that we've done and those are very, very important for really tapping the local expertise of local and regional planning entities in taking some of that detailed work out of Sacramento and down to the regions where there's more local knowledge.

CPCFA Loan-Loss Reserve Program, this is up and running now. So we seeded this with a $2 million grant and what this is, is a small business commercial loan program with backing from CPCFA and if there is a default on any of the loans we cover that with our loan loss reserve. So we're excited to have that up and running and we're waiting for kind of the initial response from the small business community.

COMMISSIONER SCOTT: Jim, let me make a brief addition here. And that is on December 7th we're going to

have a workshop here at the Energy Commission where we dig into some of those regional readiness planning grants to really understand how the decisions about where to put chargers are being made. And so Commissioner Carla Peterman from the PUC and I will be doing that, so if that's of interest to you please make a note of December 7th.

MR. MCKINNEY: Great, thank you, Commissioner.

Turning to PEV sales, so this is a little out-of-date from August, but we're at about 155,000 vehicles here in California. That continues to account for about 40 percent of the national vehicle sales, so we continue to be the national leader on that.

This also translates to about 2.8 percent of new vehicle sales, so I think the goal here is to hit 6 percent under the ZEV Regulation and the ZEV Mandate. So we're making steady progress on that and it's a very, very exciting time in the EV market.

This is a map of the fast chargers that are both planned and installed in California, so this is one of the current emphases for our EVSC solicitations is north-south fast charger corridors. And as you can see here, the red stars are the D.C. fast chargers, the blue are the NRG eVgo system, the gold is the Energy Commission planned, the purple are the Tesla super chargers and then a couple of

other companies there as well. So a big policy goal for us is to complete the West Coast Electric Highway and enable travel from Canada to Mexico on Interstate 5 and other key north-south corridors.

This was a status slide that I borrowed from Tyson Eckerle from his recent ARB Status Update, so one thing to note here is that the unit here is charge points and not chargers, so you can have multiple charge points or connectors from a charger.

I checked AFDC data set this morning, so we've got 2.700 operational charters in California right now. And about 8,000 charge points, so you can see that translates pretty well.

The big news here is the section on the bottom. We have a ways to go to get to the goals we need to do, to support 1 million EVs by 2020 and enable 1.5 million EVs by 2025.

So now the fun part of the presentation, so we have a lot of projects coming online. In the early days of these presentations it was a little dry, because we had charts and lots of promise and no pictures of anything that was constructed. Now we have a lot of things coming online. We've got a lot of new staff here at the Commission and a lot of good projects coming in the field. So this was kind of a fun section to do.

This is down at Cal State University of Fresno. They got a grant for two D.C. fast chargers and then four Level 2 chargers. You can see the event there, you can see the leaf on the bottom right and the charger there.

Going down to Burbank they received a grant for eight curbside charters and here you can see a picture of one of them with Commissioner Scott and some other local officials down there.

Was that a good time, Commissioner? It looks like it was a good time.

COMMISSIONER SCOTT: We had fun. I've always wanted to cut a ribbon with big scissors.

MR. MCKINNEY: So here's Sam Lerman, one of the guys holding the giant green scissors. So this was a grant to the Kaiser Foundation, so 50 chargers at five different Kaiser Hospital locations. So this was the one at Woodland Hills. Clean Fuels Connection was the grantee on that.

COMMISSIONER SCOTT: You know, Jim, one more thing. I should have mentioned on that Burbank Curbside Charging, one of the things for us that was so exciting about that is the curbside charging -- I don't know if you can tell -- it's in the parallel parking spaces. So in cities like Burbank and others around Southern California and Northern California it's kind of neat to be able to get them into a -- rather than, you know, the pull-in type of

parking space into the curbside.

MR. MCKINNEY: Thank you, Commissioner.

I'd like to recognize Bonnie Holmes-Gen, do you want to say good morning Bonnie?

MS. HOLMES-GEN: Good morning, sorry to be late.

MR. MCKINNEY: It's okay.

Bonnie Holmes-Gen represents the American Lung Association here on our Committee.

And here is what we're doing in terms of our charger solicitation, so we have a fast charger solicitation for $10 million that's on the street. And I think that's going to close pretty quickly, so again I'd refer us back to the map, the north-south fast charger corridors. We have another $15 million solicitation coming up and this will likely focus on the areas I mentioned earlier, so multi-unit dwellings, commercial space and the workplace.

Our Regional Readiness Planning Program continues to go, so had seven recent awards for about $1.2 million and we've got nearly $2 million available for the next solicitation.

I'm going to turn now to hydrogen where it's even more exciting. So as we've talked quite a bit we've had funding for 49 stations out there for almost two years now, 45 new stations and then 4 station upgrades through our

partnership with the South Coast Air Quality Management District. And we're now up to 33 station operation and maintenance grants and we have a mobile refueler that's nearing completion too.

A series of regional readiness grants that just focus on hydrogen in different parts of our urban areas in California. Some critical work that we've been funding, so CDFA Division of Weights and Measures, they now have a regulation allowing for the retail sale of hydrogen as a motor fuel in California. And that's the first for the U.S. and they also have technical standards and then what we call the metrology device that goes out and actually confirms that a kilogram of hydrogen does in fact weigh one kilogram.

The HyStEP device, and I forget what the acronym stands for, but this is a device that we're developing through cofounding with the ARB, South Coast and DOE and Raoul is putting it together along with PowerTech. And this is a divide that will confirm the J2601 Technical Standard, which controls temperature and pressure for light duty vehicle fueling. It's a very high-pressure system, it needs to be chilled. And it works at about 10,000 Psi or 700 Bar or Megapascal, so we really hope that that will accelerate what we call the commissioning process.

The street model for our planning and then

Tyson's salary, which I guess you can look up online. I was trying to be kind in not putting it down here, but Tyson Eckerle at GOB is the -- I think the ZEV Infrastructure Manager is his current title. So again, this is really, really exciting, because the green bar on the left used to be at 2 for quite a long time. And now we're really accelerating.

So a couple of companies that I want to recognize: First Element, which kind of represents a new business model in terms of they're an aggregator as opposed to an industrial gas company. So they buy equipment, they pull personnel from different places, and they also have some funding from Toyota. So they have four stations that are now online. Air Products has another four stations that are online.

And then some new companies: Air Liquide, Hydrogen Frontier and ITM Power out of England also have stations that are operational now. We've got another eight in the queue and we hope to see these come online by the end of the year.

So here's a map that shows Northern California, so we're at three operational thus far. One of those is a new one, the Linde West Sac station. And that necklace around the South Bay, we hope to turn that into an emerald necklace pretty quickly here. But so far it's just San

Jose that's operational.

Turning to Southern California again, so the green is starting to predominate. A lot of good stations that are coming online there, again a lot of action and it's just a really, really exciting time for those of us that have been tracking hydrogen fuel cell vehicle development, station development. You know, we call it the chicken and egg. Some people say that doesn't work, you've got to have a steady tide that rises all boats in the system and it's finally coming together. It's a lot of fun.

So here's more smiling pictures. Here's Commissioner Scott down at the South Coast grand opening. This is an Air Product system there at the Diamond Bar Office Complex in March. So the gentleman in the lower right, I didn't get his name but he's the manager for EPC, which actually installed the equipment, and Commissioner Scott with a few other Board Members from South Coast AQMD.

This is the First Element Station, so you'd think by the pictures here they only work at night. They actually work night and during the day, but they're really busting their buns to get these stations online. So they won a grant for 19 stations in early 2014 and again are working hard. And I mentioned the Toyota investment, they have investments from Honda to apply to the next

solicitation.

So the station on your upper-left is at Long Beach. I was down there about three weeks ago, and I saw a lot of pads and a lot of holes in the ground and a lot of conduit laying on the side there. And now they've got a fully functional station in front of the AMPM. This was a very high volume station in Long Beach. When I was there all the bays were full and there was a line, so this should be really interesting to see how the hydrogen fueling system integrates with that.

Costa Mesa, our upper right and lower left, those are construction photos. And then the bottom right is Coalinga.

The Mirai has been officially launched by the Toyota Corporation. So here's a shot of them coming off of the container ship. And according to the ARB survey and the AB 8 Assessment Report we hope to have 1,000 vehicles by the end of 2016. So I think Toyota's figure is about 300 for their initial launch here. Hyundai, of course, got it started last year with their initial launch. And Honda, I think, is quite active at the Tokyo Auto Show as we speak, laying out the concepts and designs for their Honda car.

So again going back to the AB 8 Report, so 2016 we hope to see 1,000 vehicles; 2017, 3,000 vehicles and by

the end of 2018, 10,000 vehicles.

We have another tranche of money coming up for the hydrogen solicitation, so we had a Concepts Workshop in August. We are now revising that and hope to release that early first quarter next year. And that'll have 17 million and just as a friendly reminder we can spend up to $20 million as per AB 8. But we need to take some out per operation and maintenance grant funding, so that takes away from the capital budget that we have to work with.

And then Jean Baronas, Phil Cazel, Sarah Williams, a lot of other folks on our staff are working hard getting out in the field, working with local planning organizations to ensure that permitting goes smoothly and anything else that we can do to assist as well.

I'm going to turn now to ZEV and Near-ZEV trucks, so this is also a very important part of our program. We've done a lot of technology development over the years and now that's really culminating with the work of the Sustainable Freight Initiative and the strategy in the Governor's Executive Order.

But you can see we're continuing to fund natural gas trucks. We have about 27 trucks on the road. Natural gas fueling infrastructure, we have about 50 stations although our focus now is more on school districts and local government, because we think the private market is

fairly functional for commercial fleets.

Commercial ZEV trucks, so that's the UPS electric truck that continues to work just fine. I see it pretty much every morning out here in front of the building when I come in. And then really the lion's share of our money now to advanced technology demonstration projects with the recent NOPA that we had totaling $31 million.

Transpower, who develops Class 8 electric trucks for drayage and port operations, won a series of awards. Hydrogenics won the first Fuel Cell Class 8 Truck Award, so that'll be our first fuel cell drayage project that we're funding. And then Motiv down in the South Bay won some additional grants for electric drive school buses and refuse trucks.

We have another solicitation coming up first quarter 2016, and I think as Andre Freeman will speak later, a big focus on freight in the ports.

Natural gas truck vouchers, so UC Irvine is now our contractor and that program is up and running. You should go check out their website; it's good.

And then again natural gas fueling, we've had some recent station awards, ten of which were school districts up and down California.

Here's some more completed projects. So this is a work truck that EPRI and the Odyne Company have been

working to develop. There's going to be five of these, this is a $1.1 million grant.

TransPower, their Class 8 trucks, so one of the fun things here is the right-hand photograph is what we call the pantograph part. And this was the Catenary Project, so catenary just means overhead electrification and the pantograph is the device that connects the battery system to the live wire. So this is them installing the pantograph on the Class 8 truck that Transpower developed, it's really exciting, the battery pack and then one of their trucks at work.

Motiv, their recent attention has been on electric school drive or electric bus -- electric school bus -- let me try again, school bus with electric drive. And they've got some good products. These have been demonstrated down in the Kings Canyon area and they recently moved into a new facility in Hayward or Fremont and there is Dr. Ayala and myself learning to operate the big scissors -- were actually pretty tricky to operate, I found out.

Turning to Biofuels -- a lot of good development here in the biofuels sector -- so you can see biogas, we've got about 15 projects or nearly $10 million in production capacity.

Ethanol, we're continuing to kind of I would say

tinker around the margins on ethanol. Most of it is corn-based, so we're adding new feed stocks -- the milo. Starting to get at some of the cellulosic process technologies, which is good but renewable gasoline, it's still very, very, very slight. And that's the drop in or the green fuel that we want ultimately.

Biodiesel is probably our biggest success at this point. We've added nearly 100 million gallons of new production capacity in California. Renewable diesel also is coming on quite well, so 165 million gallons per year in new production capacity.

For some of the recent awards what we've done most recently is the NOPA for pre-commercial advanced technology demonstrations. These are smaller grants of 300,000 to 1 million dollars. We have a couple of green gasoline projects and then a couple of algal feedstock projects for biodiesel and other biofuels.

So some more projects coming online -- this is the North State Rendering Biogas Project. It has a rendering facility up in Oroville, these are the new anaerobic digesters in there. And here's a happy gentleman filling his truck with biogas.

The Springboard Biodiesel Project in Chico, so this is about three-quarters of a million dollar grant, 350,000 gallon production capacity in dge. And one of the

things I learned when I was looking at their website, is that they actually have a license with this technology to the Air Force in Bagram in Afghanistan to create biodiesel there in the field, so it's developing quite well.

The New Leaf Biodiesel Project, this was a half-million dollar grant, which allowed them to expand their project up to 5 million gallons annual production. This is all used cooking oils and grease from the restaurant community, which is quite vibrant in San Diego. And how Jennifer Chase can wear a white dress at a biodiesel plant I'll never know, but she pulled it off and that was a lot of fun.

One thing you'll see here, just a lot of smiles. It's easy to forget sometimes that people really invest in these projects not just with their money and their investors' money, but a lot of heart and a sense of true belief that we can do this. And that enthusiasm is really fun when you get out and meet the companies, meet the principal (indiscernible) operations and see how hard they work to make their achievements.

And Pixley Biogas, this is one of our large corn ethanol bio-refineries in the state. This is down in Visalia and this is a project where they're converting dairy waste to biogas and then using that to back out some of the natural gas for the boilers in place down there. So

this is a great project. Akasha Kaur Kalsa was the Project Manager for that and I got to go down and assist in the grand opening.

One project I didn't show here that's also important, another one of the Governor's executive orders is on Forest Biomass or not Forest Biomass, but the state of the health of forests in California. We actually have a project that come to bear here. So the G4 Company has a gasification project that can handle the soft woods that we see in our conifer forest.

We had a demonstration and I think Bill Kinney was at that in Placerville. And that's one of the few process technologies that we have that can convert soft woods to a useful energy product.

For our workforce development and training, so Dave Nichols -- I don't know if you're here -- under his able leadership this continue to grow. So we're now at over 14,000 people that have been trained through this program and the assistance of nearly 250 businesses up and down California.

I just want to talk very briefly about our Annual Benefits Report, so this is our report to the California Legislature on the greenhouse gas reduction benefits from these investments.

So this is somewhat similar, we didn't -- because

the 2014 IEPR ran through December, we had a dataset through December, the changes here are somewhat modest, because it only reflects six months of additional projects and data. But you can see here that vehicles account for one-third of the expected benefits, so this assumes the project is built to design specs and operated at design-build capacity for ten years. And this is how it plays out.

So for this, the manufacturing, our medium-duty, heavy-duty trucks account for the bulk of the carbon reduction benefit. That's the green bar. The blue bar shows fueling infrastructure, so natural gas and biogas are RNG account for about two-thirds of that. Biodiesel is 14 percent. Electric chargers are at 13 percent.

And the bottom bar is diesel substitutes, fuel production. So diesel substitutes, about three-quarters of that carbon reduction benefit biogas at 12 percent and then gasoline substitutes at 12 percent.

So this slide incorporates expected benefits. I describe that. Market transformation benefits are when other investors and companies see the results of these initial projects and decide this is a good opportunity for me to invest private capital in there. We estimate those benefits to range from just over 3 million metric tons annually to about 5.4. So that's about a half a million

tons or another 500,000 tons in carbon reduction benefits from this program since December.

And just one last slide -- no two last slides. So first, in terms of program diversity this has been a major initiative from Commissioner Scott and her team of advisers. This is worth reading from the slide, so "Our policy goals are fairness, diversity of ideas, inclusion, job creation and diversity in needs."

So John Butler and Tami Haas did a series of workshops in 2014 to really get this message out into the field and I think that was quite well received. So we look forward to continuing this part of our program.

And lastly, a status report on the other parts of the program, the support analyses and reports. So I've mentioned the 2015 Benefits Report in IEPR, so those charts are also in our 2015 IEPR.

Section 3103 of our program regulations, this was a major effort to remove the credit discounting provision. So this has been successfully completed. I don't know if Tim Olson is here today. He certainly deserves a shout out for that along with our Legal Department in moving that to completion. So that was just finished in October of this year.

Commissioner Scott mentioned the Technology Merit Review that Tim Olson is also managing. We had a

fascinating set of workshops at UC Davis and here. One thing I really appreciated that when you're in a closed room with no microphones and you've got a not for attribution set of ground rules the private sector really opens up. And I think what they have to say is always fascinating and really important when you're trying to figure out how to position government grant programs to meet the industry needs, again to develop the technologies that we need to get to our low-carbon transportation goals.

So we had the Biofuels Workshop. And then we've got an upcoming series of workshops in December that'll focus on medium-duty and heavy-duty trucks.

The Sustainable Freight Initiative, so again Andre Freeman will speak to that. And then this will be our first report under AB 8. So AB 8 requires two reports. The first is from the Air Resources Board and that's an assessment of how many hydrogen stations do we have, how many cars do we have coming, and are they in sync? Are they properly balanced?

The Legislature asked for us to investigate how much it costs and how long it takes to build the stations, so we will be developing that report through this December.

And that concludes my set of the presentation and the program. So I think I'm going to turn it over to Jacob now for his section.

COMMISSIONER SCOTT: Jim, do you want to take any questions from the Advisory Committee members on your presentation?

MR. MCKINNEY: Sure. Thanks for the reminder, Commissioner.

Yeah, do we have any clarifying questions from members of the Advisory Committee?

MR. CARMICHAEL: Good morning, Jim. Could you go back to the very last slide, please?

(Pause to pull up slide.)

MR. MCKINNEY: Is that what you meant?

MR. CARMICHAEL: Yeah, I'm just trying to process all the slides you just went through. Can you run through, once again, what you just said on the AB 8 Report? I think you said you were going to do that before the end of the calendar year, but I just wanted to make sure I heard you right.

MR. MCKINNEY: You heard me right. So by December 31st of this year, and this is in the AB 8 statutory language, we need to produce a report that gives our best assessment, how long will it take, and how much might it cost to reach that 100-station goal in California. So we are working very closely with ARB's team for the AB 8 Report, so Catherine Gerhardt, Andrew, Mike Kashuba and some others. And NREL, NREL's our primary contractor for

this.

So they are taking the tools that they are developing for the H2 USA work at a national scale. And really, California is going to be the first time that this is has been put into play. And we have the biggest dataset of real world operational and cost data in North America. So a lot of that is being input into the models that they're using. And we're going to write a report.

MR. CARMICHAEL: Thank you very much.

MR. MCKINNEY: Yeah, Steve Kaffka?

MR. KAFFKA: Hi Jim. Steve Kafka. Your Figure 2 in your report, which looks at expected benefits?

MR. MCKINNEY: Uh-huh?

MR. KAFFKA: That one, I just wanted to try to understand that a little bit better, if possible.

You have a pink bar, which is benefits: expected green-house gas reductions due to diesel substitute fuels, bio-methane gasoline substitutes, which are presumably ethanol. And then above that, you have those same categories again in blue.

And then above that in green you have a large contribution for manufacturing. So just starting with the manufacturing, how does manufacturing in fact reduce greenhouse gas emissions?

MR. MCKINNEY: So most of our electric drive

manufacturing grants are for companies developing truck and bus technologies. So that's the first clue right there.

So medium duty and heavy-duty trucks have a disproportionate fuel consumption requirement, which means -- and you know the rest of that sentence. So as you develop more electric drive trucks and busses, on a per vehicle basis, you start to get some meaningful reductions in carbon emissions from that particular sector.

So I don't know exactly what the ratio is from a light duty to a heavy-duty vehicle, but it is substantial. So that's the reason for that.

MR. KAFFKA: Okay. So it's vehicle substitution effectively, the savings?

MR. MCKINNEY: Correct.

MR. KAFFKA: Okay. And then the others are just in terms of benefits from infrastructure and fuel production. I'm just concerned about if there's any kind of double counting going on in there?

MR. MCKINNEY: That's a great question. And the hardest one is on light-duty vehicles and the charger infrastructure, and so we feel pretty good that we've got most of this captured for the charging infrastructure there in the blue bars. And on the biodiesel side, most of our fuel production -- and somebody can correct me if I get this wrong -- most of our fuel production goes into the

wholesale markets as blend stock. So a little bit of it goes into E85 retail ethanol. So we've tried to be cautious on that one, but essentially, they're two different systems.

MR. KAFFKA: Okay. And then the next figure I think in your slide set, which is benefits -- lets see if I can find it here in the report too. There's expected benefits, and then there's additional market transformation benefits, and market growth benefits.

MR. MCKINNEY: Correct.

MR. KAFFKA: Can you explain the market transformation and market growth benefits a little?

MR. MCKINNEY: So not the 15-second version. You'd like a little bit longer?

MR. KAFFKA: It went too fast for me.

MR. MCKINNEY: All right, sorry Professor.

Okay, so again the notion of market transformation. One, this is what comes from the statute. So this is really the operational language in AB 8 and 118 -- transform the market.

So with our -- our investment stream is very modest and so we're again at 600 million. So expected benefits -- everything that we fund is built and operated at design capacity for ten years. So that's pretty easy to tally up.

What market transformation means is that other companies are observing what we're doing in the California marketplace with this public funding. And at some point, hopefully, expectedly, these companies say, "I think I can make money with these technologies and with private investment."

So they may come in -- so say, for example, we'll say with hydrogen fueling infrastructure. These are heavily subsidized now by the State at up to 85 percent, but we're hopeful that in a few years, additional companies will come in and say, "There's room for a deal here." And so they will build another set of stations. They may get some lower level of Energy Commission grant funding, maybe not, maybe it's all private. But that's the idea.

So with the charger industry we know there are chargers going in without public money. We don't know exactly how many. That's where the AFDC website is helpful. But if you just kind of think through all the categories I've gone through today. And again it's that capturing that concept that additional private sector investment is going to come in and add to our annual production capacity for biofuels to our EV charger fleet, our hydrogen charging system, our hydrogen fueling system, etcetera.

MR. KAFFKA: So these values are projections or

model estimates from NREL that you're providing?

MR. MCKINNEY: They're model estimates from NREL, yeah.

MR. KAFFKA: And so whatever assumptions they make about rates of growth and adoption are built into that?

MR. MCKENNEY: Correct.

And I think the best source for that is the 2014 Benefits Guidance Report from NREL, which should be available online. And if you're really interested, I can send that to you directly and we can do a conference call with Marc Melaina who was our PI for that.

MR. MCKINNEY: Yeah, Bonnie?

MS. HOLMES-GEN: Can you possibly just explain a little more about what we're learning about how the different technologies contribute to these categories of benefits?

MR. MCKINNEY: And which chart are you looking at?

MS. HOLMES-GEN: Well, I'm looking at the expected benefits chart with the side frame of the three different --

MR. MCKINNEY: This one?

MS. HOLMES-GEN: Yeah, this one. I'm looking at this one.

MR. MCKINNEY: Okay.

MS. HOLMES-GEN: I mean, we're all trying to absorb this. And just it's how much -- what information do we have about which technologies, how much different technologies are contributing to these different baskets of benefits?

MR. MCKINNEY: So let's see, I think Table ES-1 in the Investment Plan lists how many widgets we're getting for the ARFVTP investments. I make a little joke there. How many chargers? How many cars? How many trucks?

MS. HOLMES-GEN: Right, which I really appreciate all those numbers. That's great.

MR. MCKINNEY: Yeah, so you can start with that and then what we've done with Dr. Melaina and his team.

So again, for expected benefits, so these are assuming everything that we fund is built and operated at design capacity for ten years. That takes us out to 2025. And so it's essentially taking most of the equipment that's summarized there in Table ES-1 and calculating what's going to be the carbon reduction.

And say, for example, the way you do that in the truck sector is you estimate what is the avoided or displaced truck? So this could be retirement from a truck in a fleet, which we don't think happens that often with our funding. We think this funding helps displace as the

fleet expands. And instead of buying a diesel truck, they'll buy a natural gas truck or an electric truck or a hybrid or maybe a fuel cell truck some day.

And then once you estimate what that avoided truck is -- and we know what kinds of trucks we're funding, so you understand the duty cycle, the mileage and the fuel consumption -- and after that is just straight math. I'm not the math guy, but that mathematics is fairly straightforward. For the stuff Steve Kaffka was getting at that's a little more complicated.

So that's an example from the vehicle sector.

For biofuels it's even more straightforward, because we know how much biodiesel, advanced ethanol, biogas in going into the system. So it's not too hard to back out the equivalent volumes of diesel or petroleum gasoline and calculate those benefits. So that's the differential between what a gasoline-powered car would use and an EV would use or etcetera.

So is that helpful?

MS. HOLMES-GEN: I think so. I'll see if I have any more questions. Thank you.

MR. MCKINNEY: Okay. We actually haven't done a workshop on this is a couple of years. And if there's a need for one, we can fold that into -- obviously consult with the Commissioner and Randy and the Executive Director,

but that's something we can put together if enough Advisory Committee members and stakeholders would like a refresher or an update on the methodology that NREL is using.

MR. KAFFKA: I think it might -- Jim, this is Steve Kaffka -- I think it would be useful. And I think it's particularly important for California in terms of seeing the direct benefits within the State, because we certainly want to see the benefits of our green economy distributed and help build, particularly the disadvantaged communities that are paying higher costs for everything else, as a function of the policies we've adopted. So I think it's important.

MR. MCKINNEY: Okay. Thank you for those questions and comments.

MR. GOLDSTEIN: Has there been a breakdown of --

MR. MCKINNEY: Sorry, it's Brian.

MR. SHIMODA: So is he --

MR. MCKINNEY: I'm sorry, so Brian and then Chris.

I know Chris, you've had your sign up for a bit.

MR. SHIMODA: So sorry about that.

MR GOLDSTEIN: This is Brian Goldstein with Energy Independence Now.

Is there a breakdown of the greenhouse gas reductions per dollar spent in each of the individual

categories, so we can see which categories are having the largest impact at this point?

MR. MCKINNEY: Okay. Sorry, say that first part of your question again, please?

MR. GOLDSTEIN: Is there a breakdown possibly in the NREL Report that explains the GHG reductions per dollar spent in each of the categories? So we can see which dollars are really having the highest impact at this point.

MR. MCKINNEY: I see what you're saying, okay kind of the old -- we call it the metrics question.

So in the 2014 IEPR we had a good workshop. And then Charles Smith who's sitting over -- there he is -- ran a series of examples. And I don't remember exactly which ones you did, Charles, but it's there in the 2014 IEPR, so it might help answer your question.

It can be a little misleading to try to take the funding table and do back of the envelope math. I've tried to do that before, it's not quite accurate. So why don't you start with the 2014 IEPR. And that's available online. And I'm happy to work with you or other staff can work with you as well.

MR. GOLDSTEIN: Great, thanks.

MR. MCKINNEY: Okay. I'm going to go to Chris and then we have Eileen Tutt on the line.

MR. SHIMODA: So I don't want to be overly

critical of the methodology on the manufacturing, but something that might be useful just when any of us are out there talking to policy makers about what kind of the implications of this table are, is that since manufacturing is based on build capacity it might be worth just noting -- you know, small asterisks -- that it doesn't assume that incentives are not going to be needed for the deployment of the vehicles being funded or the build capacity.

There's kind of an implicit assumption that once the build capacity is there that the vehicles are going to be adopted without additional help. And so that's just something worth noting.

MR. MCKINNEY: I wouldn't take that as a critical comment at all. That's a very good comment, so thank you.

Let's see, I need to go to Eileen Tutt on the line and then I'll go to Joe. So should I just read this, or did Eileen want to speak on her own behalf?

Sorry, she can speak.

MS. TUTT: Hi, Jim. Can you hear me?

MR. MCKINNEY: Hi. Very well,

MS. TUTT: Okay. Thank you for the presentation. If you could just go to the next slide again it's really -- I mean on this one I'm wondering, did you incorporate in the market transformation benefits the investment that individuals are making in putting -- or did NREL -- in

putting home chargers in? Because I think we often tend to just look at the public chargers and the investment there, but really turning everybody's home into a charging station -- that's a big market transformation. I mean, that means when they sell the house the next person has the -- can buy an electric vehicle.

And those investments are pretty big already. I mean, people are modifying their homes or upgrading their homes to include an electric vehicle charger and I think that investment is often overlooked. So I'm just wondering if that was included here. If you know?

MR. MCKINNEY: I think I can safely say "no," because the projections that Dr. Melaina did for EV chargers tended to focus on public chargers. So that's an excellent comment, so thank you for that. We'll work on adding that into the next one.

MS. TUTT: Okay.

COMMISSIONER SCOTT: Let's take a question from Joe on this one. And then I think what I'm hearing loud and clear is that we really do need to do a workshop or some additional information to walk through the benefits and the metrics that we've put together.

We did do this for the 2014 IEPR, but that's been awhile, so we could do a little bit of a refresher. We can have Dr. Melaina come in and we can ask him questions about

all the different components or the methodologies and the assumptions and how he put this together for us.

And then we can think together about how to continue to articulate that in a way that's clear and comprehensible to folks. And if there's other places that we need to pull that information besides just this type of a report or an IEPR Report.

So that's what I'd like to suggest, but let's turn to Joe.

MR. GERSHEN: Hi, Joe Gershen. Just real quick in answering Brian's question, I think -- Brian, right?

There's great ARB data on their site about the LCFS credits generated by the different categories. And it's pretty easy to download that. There are graphs on the -- its an Excel spreadsheet -- and there are some graphs on there and some numbers.

And it pretty clearly show you which categories: biofuels, you know, specific biofuels within the biofuels category, electrics, different programs. And what amount of credits they're generating in the program by quarter and then through the whole program since its inception. So that's pretty helpful, I think.

MR. MCKENNEY: Okay. I'm going to turn it over to Jacob Orenberg now. And he's going to go through the staff recommendations for funding for this fiscal year.

MR. ORENBERG: Well, good morning again. My name is Jacob Orenberg. And I am the Project Manager for the 2016-2017 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program.

The annual Investment Plan Update serves as the basis for all solicitations, agreements and other funding opportunities for each fiscal year. When developing this year's Investment Plan we assumed a full allocation of $100 million to support a broad portfolio of fuels and technologies that help meet the policy goals of the ARFVTP.

I do want to note that the allocations described in the Investment Plan and during this workshop are for general project categories, not individual projects. And we won't be considering individual projects or solicitations in this workshop.

This schedule summarizes the major milestones in the development of the 2016-2017 Investment Plan Update. We released the Draft Staff Report on October 22nd and are holding the first Advisory Committee meeting today, of course. We will release a Revised Staff Draft by January 10th, which is required in advance of the Governor's Budget.

A second Advisory Committee meeting is also expected to be held sometime in late January.

Finally, the Lead Commissioner Report version

will be released in March. And we anticipate business meeting approval of the final document in April.

There are a few key considerations worth mentioning, which are new for this Investment Plan Update. I'll briefly summarize each of these issues now and provide more detail while discussing the individual allocations.

The first is the upcoming California Sustainable Freight Action Plan, which is a joint effort among several state agencies to improve the California freight system. The Low Carbon Fuel Standard was also readopted at an ARB Board meeting in September, which updated many of the carbon intensity values for the fuels we deal with.

One of the most notable updates was to the carbon intensity of fossil natural gas, which is now quite a bit higher than previously assumed. In addition, the first low NOx engines for natural gas trucks were also certified by ARB in September and we're fortunate to have a representative from Cummins Westport on the phone who will provide a presentation about these engines a little later on.

Finally, the 2015 Annual Evaluation of Fuel Cell Electric Vehicle Deployment and Hydrogen Fuel Station Network Development Report was released earlier in the year by ARB. This report provides guidance to the Energy Commission for continued deployment of hydrogen stations.

This slide provides an overview of the structure of the Investment Plan. As you can see, the program covers nearly the entire supply chain for alternative fuels from production, to distribution infrastructure, to vehicles. The remainder of this presentation will follow this structure as well.

The first category in the Investment Plan is Biofuel Production and Supply. The ARFVTP defines biofuels as non-petroleum diesel and gasoline substitutes and biomethane. We have a sizable allocation for biofuels, because of their large potential to reduce greenhouse gas emissions and petroleum use.

This chart shows the revised carbon intensity values for a few different biofuels and pathways in order to illustrate their potential. These revised numbers were part of the recently readopted Low Carbon Fuel Standard and show substantial greenhouse gas emission reductions when compared to their fossil fuel counterparts.

Biofuels also provide a near term opportunity to reduce petroleum use. And on a related note Governor Brown stated a goal of reducing statewide car and truck petroleum use by up to 50 percent by 2030 during his 2015 Inaugural Address.

To date, our program has awarded almost $140 million to 49 biofuel production projects covering most

biofuel types. The projects span various states of technology development ranging from pilot scale production scale operations to full commercial scale production facilities with an increasing number of projects completing construction and beginning operations.

For fiscal year 2016-2017, we are proposing to maintain the biofuel production and supply allocation at $20 million. This year's Investment Plan Update continues to leave these funds open to multiple fuel types and development stages. Future projects may be required to provide greater benefits per dollar awarded or may need to utilize more advanced pathways or feed stocks. This would be meant to encourage more advanced projects, which are likely to have great potential, but have not yet been funded by our program.

Examples of these might include renewable gasoline production or projects which utilize underutilized feed stocks such as woody bio-mass.

Also, one of the big stories with plug-in electric vehicles this year is that we hit 150,000 vehicles sold in California in August. To put that in perspective it took nearly four years to sell 100,000 PEVs in the State, which began in December 2010 and achieved that milestone in August 2014. It then took only 12 months to sell the next 50,000. So the number of PEVs on California

roads is steadily increasing as illustrated by the lower green line in this graph.

The sales pace may also accelerate further over the next couple years as several new or redesigned next-generation PEVs hit the market such as the Chevrolet Volt, Nissan Leaf and Tesla's Model XN3. Continued investment in charging infrastructure will be needed to keep pace with the ever increasing number of PEVs on the road.

This chart shows the number of charging stations the ARFVTP has funded as of September. To date, we've awarded over $40 million to install over 7,500 chargers with a little more than half of these being at single-family residences and the remainder at multi-unit dwellings, commercial buildings, work places, fleets and the like. Unfortunately, this isn't where we really need to be to achieve the goals of the ZEV Action Plan.

This next chart shows the estimated number of additional chargers needed statewide for 2017 and 2018, in order to meet these goals. The analysis provides two scenarios. The first being a home-dominant scenario, in which the majority of charging occurs at an owner's residence resulting fewer required public chargers. The second scenario is the high public access scenario which assumes the majority of charging occurs away from home and requires more public chargers.

These two scenarios can be views as a lower and upper-bound of the number of additional public chargers that were estimated to be required. The actual number, of course, will be determined by market forces and will most likely fall between these two estimates.

Even so, this analysis suggests tens of thousands of additional chargers are needed within the next two to three years. Since the market and business models for public chargers are not yet fully mature, we expect a significant number of these will require State funding.

Going forward, we are proposing to maintain the allocation for electric charging infrastructure at $17 million. In the future, there may be more of an emphasis on chargers at multi-unit dwellings and fast chargers, both of which have been relatively underserved compared to other charger types.

There are, or course, some other large EV charger projects in the State, one of those being NRG's EVgo charger network. And also, the proposals for investor-owned utilities, which are currently under review by the CPUC. Despite this, we foresee a strong need for ARFVTP funding since the aforementioned projects are far more limited in scope and geographical area.

We've had some significant developments with hydrogen refueling stations and vehicles over the past year

as well. Right now, 13 ARFVTP-funded hydrogen stations are operational. To put this kind of in perspective when we finalized the Investment Plan Draft Staff Report just a few weeks ago there were only two open. So the rate of station deployment is certainly picking up.

In addition, Hyundai's Fuel Cell Tucson SUV has been on the market for awhile now and Toyota just released their Mirai Fuel Cell Sedan last month. ARB also released that second AB 8 Annual Evaluation Report in July, which details the need for additional hydrogen refueling stations over the next three years by analyzing DMV data, auto maker projections, targeted areas and station coverage.

Energy Commission staff also used these recommendations in this report to develop the priority areas and purpose for future hydrogen fueling station deployment.

One of the major issues in this year's report is the projected shortfalls in hydrogen fueling capacity. In the graph on the screen the middle purple bar represents the projected station capacity as of 2015, going forward to 2021, measured in the number of vehicles which can be supported.

The dashed red line represents the number of hydrogen fuel cell vehicles projected to be on the road.

So as you can see, the report is projecting

statewide hydrogen refueling capacity shortfalls as soon as 2021. What's not shown on this graph is that the report also projects localized capacity short-falls in certain regions as soon as 2018.

We're proposing to continue with a $20 million allocation for hydrogen refueling infrastructure, which is the maximum allowable under Assembly Bill 8, and is consistent with the recommendations in the 2015 Annual Evaluation from ARB. This should be enough for funding for seven or eight stations, plus ONM support.

The operations and maintenance funding is needed to support the business case of station developers since the deployment of hydrogen vehicles is still in the early stages.

Because the Annual Evaluation Report is projecting capacity shortfalls, even with the maximum $20 million allocation for hydrogen, Energy Commission staff will discuss these issues with ARB and stakeholders to ensure that the available funding is used as effectively as possible -- and also to find ways to increase fueling capacity.

For natural gas fueling infrastructure, the majority of private fleets are able to access capital to pay for station costs. Given this the Investment Plan will continue to prioritize natural gas fueling infrastructure

funding to school districts and other municipal public fleets which have restricted access to capital.

For the upcoming fiscal year staff is proposing a $2.5 million allocation for this category, which is reduced when compared to fiscal year 15-16. The relatively large allocation last year was meant as an opportunity for school districts and municipal governments to upgrade out-of-date infrastructure and was not meant to continue at the same level indefinitely. We do believe that this year's allocation will be adequate to meet demand.

Staying on the topic of natural gas there have been a number of new issues, which have come up over the past year. The first of which is the price of petroleum, which has dropped dramatically since 2014. And as a result has hampered the economics of natural gas. While the diesel gallon equivalent price of CNG has remained about the same, the price per gallon of diesel fuel has dropped from about $3.90 per gallon, in April 2014, to $3.03 per gallon just 12 months later.

This reduced the positive price difference of CNG by two-thirds to about 40 cents per diesel gallon equivalent. And, in fact, as of last week the average price per gallon of diesel fuel in California was down to about $2.70 per gallon, which is essentially on par with the reported price of compressed natural gas from April.

Another major issue effecting natural gas is revised carbon intensity numbers from the re-adoption of the Low Carbon Fuel Standard, and the switch in models to CA-GREET 2.0. The revised numbers calculated with this new model are higher than previously believed and now show a reduced benefit, compared to diesel.

When we first started this program, the best numbers available suggested fossil natural gas reduced greenhouse gas emissions by about 30 percent, compared to diesel. Last year, it was assumed to have a 15 to 25 percent benefit. Now these new carbon intensity numbers are showing a carbon benefit of only 15 percent for fossil CNG and no benefit for fossil liquefied natural gas.

Despite this, we do see a valuable role for natural gas vehicles going forward. Although fossil CNG is now only showing very modest greenhouse gas emission reductions, biomethane CNG is still estimated to reduce carbon intensity by up to 50 to 125 percent below that of diesel, depending on the pathway used.

In addition, low NOx engines are expected to be made available for purchase as soon as the second quarter of 2016. These engines are certified to have nitrous oxide emissions 90 percent lower than the existing standard for diesel engines.

In September, a Cummins Westport 8.9 liter

natural gas engine became the first to be certified for this low NOx standard. The emission technology used in the engine is also scalable to the 6.7 liter and 12 liter models. So we're hopeful Cummins Westport and other manufactures continue to develop and release these low NOx engines for a wide variety of medium and heavy-duty vehicle applications.

Looking ahead, these low NOx engines may be a primary method of achieving the future ambient air quality standards in non-attainment areas.

When biomethane fuel and low NOx engines are combined the life-cycle vehicle emissions are near or equal to those of an equivalent zero emission battery or fuel cell electric vehicle. So we think that these two technologies have quite a bit of potential for the California transportation sector.

For fiscal year 2016-2017 we are proposing maintaining the allocation for natural gas vehicles at $10 million. Although there are some new concerns with fossil CNG there are also some new opportunities and possibilities with other technologies.

Going forward, the ARFVTP may consider limiting vehicle incentives to low NOx engines, if an appropriate low NOx engine is available for the specific vehicle type and weight class. We may potentially target vehicle

purchases for fleets, which combine both low NOx engines and biomethane fuel use as well.

This next category focuses on the demonstration and scale up of advanced technology medium and heavy-duty vehicles. As you can see, from the statistics on this slide these vehicles account for a small number of the total vehicles on the road, but have a disproportionate impact on greenhouse gas emissions making them a tremendous opportunity to help meet the State's climate change goals.

That said, we're dealing with a broad range of vehicle weight classes and purposes, each with their own specific power train needs, which require unique solutions.

Perhaps the biggest issue affecting this category is Executive Order B-32-15, which requires numerous state agencies, including the Energy Commission to develop a Sustainable Freight Action Plan. The plan is meant to improve freight efficiency, transition to zero emission technologies, and increase the competitiveness of California's freight system. The ARFVTP is expected to play a part of carrying out the Sustainable Freight Action Plan.

We have included some modifications to this category, both the support sustainable freight activities and expand the reach of eligible project types. This may include allowing refueling infrastructure as an eligible

expense whereas in the past it could only be counted as match share.

We may also target specific freight corridors with comprehensive projects, which integrate advanced technologies, alternative fuels, infrastructure and local economic development opportunities.

Finally, non-propulsion technologies may also be targeted, which for example may include autonomous vehicle demonstrations or intelligent transportation systems.

For the coming fiscal year staff is proposing to increase this allocation to $23 million to support the upcoming sustainable freight activities and possible new project types.

In addition, we noticed the previous solicitation was significantly over-subscribed, in large part, because of the higher differential costs associated with the proposals we were receiving. These are now being submitted for heavier class vehicles, more capable vehicles and more advanced power trains.

Finally, I'm going to provide a summary of the related needs and opportunities categories. These allocations are meant to support alternatives fuels and advanced technology vehicles beyond what is proposed in the previous categories.

First is our emerging opportunities allocation,

which is set aside for project types, which weren't anticipated during the Investment Plan development process. In the past, this category has also targeted Federal cost share projects to bring Federal grant money to California. We're proposing an allocation of $3 million for this category based on historical demand for these funds and balancing the needs of other allocations.

Our workforce training and development activities are continuing with interagency agreements with the Employment Development Department and the Employment Training Panel.

Energy Commission staff is also developing a third agreement with the Alternative Transportation Technology and Energy Center, the purpose of which is to support the California Community College system. As you can see in this slide this category has provided significant assistance to trainees and businesses for alternative transportation workforce needs.

For fiscal year 2016-2017, we are proposing a $2.5 million allocation, based on the anticipated needs of these agreements.

Finally, we have a regional readiness category, which helps local agencies prepare for and expedite the deployment of alternative fuel vehicles. In our discussion with local and regional governments we're seeing a

continued need for planning and implementation support this year. So for the coming fiscal year we are proposing a $2 million allocation for the regional readiness category.

Those are all the categories we are proposing for funding in this version of the Investment Plan. We'll be seeking feedback on these allocations, the Investment Plan, and the program in general from all stakeholders. In order to incorporate any comments into the Revised Staff Draft we're asking to receive them no later than Monday, November 16th. We prefer to receive comments through the Energy Commission's E-commenting system and there's a link to that on this slide and in the workshop notice. We also accept comments via email and regular main and instructions for where to send these are also in the workshop notice.

We are anticipating releasing the Revised Staff Draft and the Investment Plan in advance of January 10th, which is the deadline we have and are planning to hold a secondary Advisory Committee meeting in late January with a location yet to be determined.

This slide shows a summary of all the funding allocations we are proposing in this draft of the Investment Plan. I will leave this slide up during the Advisory Committee discussion, which will begin momentarily.

I can also answer any clarifying questions about

this presentation now. However, please hold off on any questions or comments about specific allocations until the discussion or the public comment period. Thank you.

Are there any questions -- Ms. Sekita?

MS. GRANT: Thank you, Jacob. Is it possible to go back to another slide or are you wanting to leave it?

MR. ORENBERG: Sure.

MS. GRANT: To Slide 10?

I'm wondering, is it possible, or is there any interest in looking at this breakdown in a more granular level, so that -- basically I'm thinking that there's certain areas that might be more home dominant or require a more home-dominant system. There are some areas that maybe have more multi-unit dwellings in it that might benefit from having a strategy that's more high-public access?

And so, it might be beneficial to have -- I don't know if the Energy Commission already has done this -- but looking at more regionally or geographically to see what types of areas might benefit from a more home-dominant versus high public access or vice versa?

MR. ORENBERG: Okay. Thanks, Sekita. I think I'm going to defer to Jim McKinney to answer that one.

MR. MCKINNEY: Yes, thank you Sekita. I think that's a great observation and comment.

There is an entire report that goes with -- so

you're just really seeing the slide or the numbers rolled up to their most aggregate level. But the tables that NREL has put together are on a regional basis. And I think that there's about 20 California cities that are identified with recommended charger levels, both with the home dominant and high public access amounts. So that is in there and we'd be happy to work with you and help get you up to speed on that body of work.

NREL is kind of queued up to do an update to that. We've had some contracting challenges with DOE for the next tech support contract. And we also need them to finish the AB 8 Report before they can turn to this one. But that is queued up for ongoing work with NREL.

MS. GRANT: Great. Thank you.

MR. ORENBERG: Yes, Steve?

MR. KAFFKA: Steve Kafka. So this pattern of allocation of resources continues what I would consider the tradition here of balancing investments across the range of technologies, which I generally favor, because it's hard to tell what will be the true winning technology in the long run. You mentioned, however with respect to natural gas fueled vehicles, that there have been changes in carbon intensity associated with that, that nonetheless still from your point of view, support investment in that technology, which I would agree with.

However, I'm a feed stock person. And one of the things that's always been of concern to me is with another technology, which is a cool technology, which is fuel cell vehicles. What does the Energy Commission consider to be the feed stock for the hydrogen that powers those fuel cell vehicles? And do you see at some point in the future any firm motion that those feed stocks might come from renewable sources and not, for example, compete with compressed natural gas vehicle sources and so on.

MR. ORENBERG: Steve, I'm thinking this comment might be more appropriate for the discussion when we hit natural gas or hydrogen fuel infrastructure. And I'm probably going to have to defer to someone from our hydrogen team to answer that.

COMMISSIONER SCOTT: I will add, before we get to that discussion, that we are thinking very much about how renewables can help us generate more hydrogen. Especially when you think about the situation that we're in, with some over-generation of renewables in the middle of the day and is there a possibility to take those -- you know, take some extra wind or whatnot to run your electrolyzer to make the hydrogen that could then go into a fuel cell electric vehicle?

So we are very much thinking about how the renewable electricity system starts to really fit in with

the transportation system and fits in with the natural gas system as well.

MR. KAFKA: Thank you.

MR. MCKINNEY: Yeah. And Steve, I would invite you to raise that again as we get into the kind of policy discussions of these categories, because these new technologies don't fit into the categories that have served us quite well to date.

MR. ORENBERG: Any other general comments about the presentation? Bonnie?

MS. HOLMES-GEN: Bonnie Holmes-Gen. I just have a general comment that it's so incredibly important that these incentives and this Investment Plan is well aligned with the Sustainable Freight Strategy at ARB and the Scoping Plan that is under way, under development. And I appreciate all the framing that you have in here about that is.

And I'm just wondering how you plan to continue making sure as this plan is finalized, and as we go forward -- we have all these processes going on simultaneously. I believe the ARB presentation on sustainable freight is coming up at their Board meeting. And the Scoping Plan workshops are underway, but we have a lot of processes going on next year. So which is how can we best make sure that these plans are well aligned? And how can we help

with that?

MR. ORENBERG: As we continue to develop the Investment Plan we will continue to coordinate with the staff here at the Commission who deal with the Sustainable Freight Action Plan to make sure that we are up-to-date and in line with that plan. And if you or anyone else has any suggestions or comments for how we could better do that, I would invite you to submit them to the docket.

COMMISSIONER SCOTT: I'll note that we do have our sleeves rolled up. We're working hand-in-hand with the Air Resources Board on sustainable freight and also on the Scoping Plan.

MS. HOLMES-GEN: And I know that. It's just so important from -- to be continue melding these different pathways to achieve our greenhouse gas goals and achieve, of course, our criteria air pollution goals. And this is just amazing work going on, both tracks there. And this is an important key -- this incentive funding together with GGRF to make all of these plans work.

COMMISSIONER SCOTT: Right. It might be a perfect transition, too. I think we've got Andre Freeman here with a couple slides on sustainable freight. Did you want to do that now or you wanted to do that as part of medium-duty/heavy-duty?

MR. ORENBERG: Actually, we're going to hold off

on that until after the medium-duty/heavy-duty discussion.

COMMISSIONER SCOTT: Okay. No problem.

MR. ORENBERG: Thanks.

MS. HOLMES-GEN: So is this the time to bring up comments on electric vehicle infrastructure or (indiscernible)

MR. ORENBERG: No. We would hold off on that.

MS. HOLMES-GEN: Thank you. Okay, all right.

MR. ORENBERG: Any other general comments?

Okay, well now --

MR. CARMICHAEL: Welcome. This is Tim. I'm just saying welcome, because I know this is your first workshop with us.

MR. ORENBERG: Thank you.

(Laughter.)

MR. CARMICHAEL: And we're a scary group, but you'll get to like us over time.

MR. ORENBERG: Thanks, Tim.

So I think now, we will continue on to the Advisory Committee discussion starting biofuel production supply. Thank you.

MR. MCKINNEY: So again, Jim McKinney. So I'm going to moderate the Committee and public discussions for the remainder of the day. So the process we'll use is that we will go through line-by-line here on the category.

Please turn your card up, so that I can know that you wanted to speak to a specific topic. And I see Joe already knows the process well and is ready to go. And so we'll go -- the way this works we'll do Advisory Committee members present, Advisory Committee members on the phone, members of the public present, members of the public on the phone.

Before we do this I forgot to say one thing in my program summary presentation. So one of the, I think, legacies that Randy Roesser will leave are a whole bunch of new staff. So he and John Butler and Kyle Emigh were just heroic in getting a major BCP approved this year. So thank you Randy for that.

And I'd like to invite all the new program staff who are sitting there -- I know a lot of your are back-benchers -- but if you could just stand up, smile and wave. I think that would be great, because we've got some incredibly talented new staff here. Gee, there we go. There we go.

(Laughter.)

Great. Welcome everybody. It's really -- there's just some tremendous intellects that have been added to our program staff now.

COMMISSIONER SCOTT: And can I? I would love to second that. We're so thrilled and delighted to have had a

chance to build up the capacity of our program just a little bit with $600 million and 500 projects. It's great to have our new smart, dedicated, committed folks on the team. So we're really happy to have them here. I hope that you all will get to know them.

And since I'm making a plug for the Energy Commission we do have a couple of additional positions that are open. So if you are interested or if you know folks that are interested please take a look at our list. We're looking for folks who love to have their sleeves rolled up and are dynamic and excited about transportation and transforming transportation.

So, with that, I'll stop.

MR. ROSSER: And I would like to take credit for hiring each and every one of them. Unfortunately, I cannot, but what I can tell the group here is that our supervisors in the unit, collectively got together and developed a strategy to recruit.

We received something in the neighborhood 100 or 150 applications for a limited number of positions. They interviewed several dozen, maybe four dozen people and the folks you see in the audience here rose to the top.

So congratulations to those folks that are on board with us. And as Jim and Commissioner Scott said, we're very happy to have you here.

MR. MCKINNEY: Okay. With that let's start today's Advisory Committee discussion, the staff recommendations for funding.

So I'm going to recognize Joe and then Howard.

MR. GERSHEN: Hi, Joe Gershen. Tim beat me to it, but welcome Jacob and thanks again. Welcome everybody else. Thanks for all the hard work on this Commissioner Scott and staff.

I do have some concerns that this plan might be overly focused on potentially transformative technologies and not enough on biofuels, biodiesel in particular, obviously. These have been providing close to 90 percent of the carbon reduction benefits to the ARFVT program to date.

We continue to propose separating the biofuels into separate silos or categories, one for diesel substitutes, one for gasoline substitutes, and one for biomethane. We also think that each of these biofuel categories should receive funding allocations more commensurate with the benefits that they're providing and will continue to provide for years to come.

While we support the pursuit of transformative technologies, and the benefits we hope they will provide, we know for a fact that biofuels are actually providing real benefits today and will continue to do so into the

future. So we think ARFVTP funding support for them should be increased.

Additionally, we feel that future biofuel solicitations and awards should focus on smaller innovative technologies and the development of low carbon purpose-grown energy crops and other feed stocks as well as helping other existing productions facilities expand their capacity.

Obviously, still remain concerned that this plan doesn't contain appropriately robust and objective metrics for evaluating budget allocations. We've discussed this before -- setting up a separate panel -- but I'm not sure that's actually getting any traction.

We note that diesel substitutes have once again received approximately 10 percent of ARVTP funding since its inception. But I want to point out that this category, and biodiesel in particular, has been providing significantly more than 10 percent of the program benefits.

We know, for example, that since inception of the LCFS, the Low Carbon Fuel Standard, biofuels have provided 90 percent of all the credits generated in that program, according to the ARB figures that I mentioned earlier.

Alternative diesel fuels alone have provided 32 percent overall, while electricity for example, has provided just 2 percent.

We suggest that more funding should be provided for alternative fuel and vehicle strategies that are realistically going to contribute to achieving the 10 percent greenhouse gas reduction goals by 2020.

This Investment Plan Update has two tables, ES-1 and 2, which illustrate the amount of funds spent and budgeted. To avoid misleading conclusions these tables should be supplemented with additional tables, which show the breakdown of all expenditures by fuel type, in my opinion.

At first glance, looking at ES-1, it appears that diesel substitutes received a fair proportion of funds, however if all of the categories into which other fuel types were separated were added together, it would give them a much more transparent basis for comparison. When this is done it becomes apparent that diesel alternatives actually receive much less than electricity or natural gas.

At current, in-state biodiesel production capacities -- a few facts and figures that I think you'll find interesting -- current in-state biodiesel production capacity of 59 million gallons a year. California biodiesel producers have created hundreds of high-paying green jobs in some of the most disadvantaged communities in the State, while reducing over 610,000 metric tons of carbon emissions from our atmosphere. This production

capacity is also equivalent to removing almost 140,000 cars from California roads.

Preliminary estimates are showing that biodiesel plants will contribute approximately $350 million in economic activity to California's economy in 2015. With consistent support our industry can quickly increase in state capacity to 200 million gallons a year, which would generate $2 billion in economic impact annually.

For every $1,000 invested from ARFVT Program the biodiesel industry can deliver close to 1,350 gallons of ultra-low carbon diesel production per year, which in turn would reduce 14 tons of climate changing carbon emissions from our atmosphere. That's like taking over three cars off the road for every $1,000 spent. Additionally, based on current market economics this $1,000 investment would generate recurring economic contributions of $5,400 per year.

And if we bring our in-state production capacity up 200 million gallons a year it would be equivalent to taking an additional 332,000 cars off the road and taking an additional 1.4 million metric tons of carbon emissions out of our atmosphere every year. All while creating hundreds of high-paying permanent jobs in the State and contributing $2 billion to the State's economy.

In chapter three, alternative fuel production and

supply, we also note that once again no funding has been allocated for biodiesel infrastructure. While we certainly appreciate the past funding for new and expanded production projects we'd like to point out that only about 16 percent of major fuel terminal and rack locations around the State offer storage and blending for biodiesel.

No matter how much capacity we have in the State, we need to be able to blend the biodiesel in a majority of distribution locations in order to increase overall consumption. This will complete the distribution cycle and get fuel into the widest possible market.

We feel that biofuels funding allocation should be increased overall and that some portion of the extra funding for biofuels should be allocated to expand existing blending and storage at major fuel terminals and racks around California. I think that's an important point. We've missed the infrastructure for many cycles now for biodiesel.

Look, we value the open dialogue and relationship we have with the Energy Commission. We look forward to continuing to communicate with staff. We hope this will lead to even more meaningful funding allocations for the biodiesel industry in the near future. Thanks very much for all the hard work.

MR. MCKINNEY: Okay. Thank you, Joe. I wanted

to ask a couple of clarifying questions.

So I think as the Chairman, when he sat in these meetings last year, would ask so if you do want to increase the biofuels allocation are there other categories from which you think it should come?

MR. GERSHEN: Yeah, and I can certainly address that. I've not gone through it. We just put these statements together in the last couple of months.

MR. MCKINNEY: I'm not trying to put you on the spot --

MR. GERSHEN: Sure, sure.

MR. MCKINNEY: -- but I think that's the beauty of the Advisory Committee and the circle that we have here today is that it’s a zero sum game. We all know that 100 million just is not enough to do what we need to do in the State. We know that.

MR. GERSHEN: It's not. Right and we -- you know, this goes back to the metrics discussion, which we've been having obviously -- a little bit of the elephant in the room -- for years now. And it's really a matter of looking at it and saying, "Well, who's providing what benefits according to what the goals are? And how should we do that?"

And it seems like I think if you look at it, I won't call out and point out anybody else, but I think if

you look at what biofuels is doing and in this case biodiesel is doing -- if you look at that and say well, "Is there is some percentage of that that should be funded commensurate with that amount?" we think yes. And it's way, way under what would be commensurate.

We're not even saying "equal to," just even half would be kind of cool. But it's nowhere near what the benefits are. And like I said biofuels are providing 90 percent of the benefit. And it’s a little -- I mean, you and I had a conversation I think last year about the fact that biofuels are getting 20 percent, what's the problem? Biodiesel is not getting 20 percent.

And so when you group the diesel substitute, gasoline substitute, and biomethane together and call it biofuels the question might be, "Well, if you're looking at zero emission vehicle technologies like electric and hydrogen why not group them together in the same group?"

Again, I’m not trying to cast stones or anything like that, but it’s a question of how to do it the most fair way and what's going to get the best return on the investment. Because you know investors, in a private equity for example, would look a program and they'd say, "Well, what's the return?" Each year they're going to analyze it and say, "What's the return on the investment? And where should we be reinvesting?"

And that's just something I think is important to have -- you know, objective metrics rather than perhaps expected benefits. It's more like, "Well, what are the actual benefits?" So I think that's what we've -- several of us on the Advisory Committee have been sort of lobbying for and we've just not seen it yet.

MR. MCKINNEY: Okay, yeah. And thank you, Joe. You've really been a champion for the metrics. And I really appreciate you taking the time to calculate some of those out and give us an idea of how you think those might be applied here.

MR. GERSHEN: Yeah, and that's the goal in these numbers in the second part of my discussion was, "Hey, here are some real numbers and here is what it really looks like out there." And then you guys obviously have the difficult task of how to allocate the funds, but we're just saying, "Hey, maybe a bit more for these categories."

MR. MCKINNEY: And my other clarifying question was so in terms of the feed stock allocations, what is your recommendation on that, say within the biofuels category?

MR. GOSHEN: How do you mean? You mean within the different --

MR. MCKINNEY: Say within the different process technologies we have: biogas, biodiesel, ethanol.

MR. GOSHEN: Yes, there's gasoline substitutes,

diesel substitutes, and then biomethane.

I think there's some also some really interesting -- I mean I had suggested maybe some smaller innovative technologies for funding.

No one's really addressed green crude, for example. I mean, there's some really interesting technologies out there that are capable or appear to be capable of generating green crude from biomass or other sources. And that green crude ostensibly can be dropped into existing refineries, petroleum refineries. Obviously there's some work to be done, some heavy lifting there, but perhaps some of those need to be looked at.

And those would then -- you know, how do you look at a pathway there? That's a whole other can of worms, but if you're looking at a small refinery in the Central Valley or anywhere in the State, or out of the State for that matter, and you have green crude, some percentage of green crude, that has a very low carbon intensity because it's made from woody biomass or it's made from municipal solid waste or whatever. And you can turn that through hydrothermal liquefaction or some other technology like that. It's going to have a very low carbon intensity would serve to lower overall carbon intensity for the petroleum pool here.

MR. MCKINNEY: Well, thank you. Thank you very

much, Joe, for your contributions.

MR. GERSHEN: Sure.

MR. MCKINNEY: So I think we're going to go Howard, Erik and then Claire.

MR. LEVENSON: Thanks Jim. Before I make my comments, I just want to laud the Commissioner and whole team. You've done a great job again as always. It seems seamless. It can't be, but way to go.

Thanks to Joe for queuing up that discussion. It's great to follow that.

I want to -- of course, we'd all like to see a lot more funding available for specific categories. And I'd like to see that for the biofuels as well. But knowing the constraints that you're under, from Cal Recycle's perspective we can certainly support the recommendation that you've got in the plan right now for continuing that $20 million for biofuels.

I do want to make one specific recommendation. We've submitted a recommendation to the docket with a number of other recommendations. But there's a statement on page 34 of the draft that the goal should support pre-landfill biomethane production and that the Commission supports that and might consider prioritizing pre-landfill biomethane in future solicitations.

And we'd like to recommend that you simply make

that prioritization part of the current plan. There's no reason to wait given the Governor's five pillars. The short-lived Climate Pollutant Policy that the Air Board has got on its docket for adoption in December, our own mandates on getting organics out of landfills, and of course the Low Carbon Fuel Standard that's been renewed recently.

Organics are moving out of landfills, making that prioritization right now would be an additional part of that whole effort. So that's our primary comment that I'd like to make today.

MR. MCKINNEY: Okay. Thank you, Howard.

And let's see we had Erik?

MR. WHITE: Thanks, Jim. Certainly, we want to echo some of the other comments. ARB supports the proposed allocation. And we understand, as you do, that there's never enough funding available to fund all the projects -- that need -- and essentially to Joe's comments that additional monies are needed

But I think if you look at the balance that CEC has made in the proposed funding amounts -- and we'll talk about some of the other categories a little bit later -- I think it's really important to recognize that you are trying to achieve both near-term and immediate reductions, but invest in long-term technologies that are going to

deliver those longer term benefits as well.

And I'm thinking in particular about some of the medium and heavy-duty advanced vehicle technology demonstrations that you have and are proposing to fund, which we fully support you doing. And I think if you look at the successes you've seen in that and the investments you've made in conjunction with the South Coast Air District, for instance, on bringing low NOx clean technology natural gas engines to the marketplace is really a true testament to the importance of continuing substantial investments in those areas.

And if you look at our Mobile Source Plan, there's been a lot of discussion about the Freight Plan, the upcoming Scoping Plan there is a need for both clean combustion and zero emission technologies in all the transportation sectors moving forward. And so finding that appropriate balance between fuels, and vehicle technologies, and infrastructure is really important and we think you've done a really nice job of finding that balance with this plan.

MR. MCKINNEY: Great. Thank you, Erik.

Claire?

MS. JAHNS: Thanks for having me here. This is an exciting discussion to be a part of. And I wanted to echo some of Howard's comments and it was mentioned earlier

the need to potentially look at woody biomass, with a renewed focus. And as an interesting example of a pathway or a feed stock that can serve a waste reduction or waste management goal, kind of pre-landfill diversion, as well as producing vehicle fuels and natural gas for vehicles and other uses. So I would just support that investigation going forward.

The G4 technology was mentioned. This is probably a little bit of a newer area with newer technology that's being developed. But there's clearly a lot of feed stock out there and the good thing is trees keep growing whether or not they get planted actively. And so the Governor's State of Emergency Declaration last week really underscored the need, the kind of unprecedented need, we have now to manage the volumes. But of course those volumes will persist over time.

MR. MCKINNEY: Let's see, then I have Sekita, Tim and then Steve.

MS. GRANT: Thank you. So yeah, I start out echoing -- thank you, because obviously I know there's a lot of hard work, a lot of expertise that goes into creating this document even though it's just an update. I know that this is a lot of effort on your team's part, so thank you very much for the work that goes into this.

A couple of points that I wanted to make and then

I will add to my to-do list to do written comments as well, but I wanted to call out the acknowledgement of the need and interest in doing more creative financing, looking for more creative financing mechanisms, to really leverage and make this what's already been identified as a limited pot of money go further. Particularly the project you all have with the CPCFA. We're really excited to see that roll out and potentially similar projects.

And absolutely giving a thumbs up to the program outreach and inclusion section. We really appreciate your team putting resources and time into thinking about that.

The program diversity slide that outlines the priorities that you have, Commissioner Scott, is excellent. I think it's reflected in this document. If not, hopefully it will be.

I also wanted to speak a little bit to the statement around multi-unit dwellings accounting for 40 percent of housing stock here in California, but only 4 percent of PEV owners reside in apartments or condos. And we all know that this is a huge problem. It disproportionately impacts low and moderate-income communities and people of color. I want to acknowledge that not only is the Energy Commission thinking about this problem, but is doing so in a very solution-oriented way.

The expert adviser idea that you propose in this

-- I'd love to hear more about it. I think it sounds like a great idea, similar to how the State addressed charging infrastructure in other areas in working with Tyson Eckerle and having an ombudsman to address those difficult problems. I think it's very smart to go that route around multi-unit dwellings, which has repeatedly through the years been acknowledged as a huge barrier.

MR. MCKINNEY: Yeah. Sekita, these are wonderful comments. As a friendly reminder we try to kind of separate them by topic --

MS. GRANT: Oh, okay. Okay.

MR. MCKINNEY: So if I could ask you to save your EV comments for that part of the Committee discussion that would be great.

MS. GRANT: Sure, sure.

MR. MCKINNEY: Did you have anything more on the biofuels?

MS. GRANT: On the biofuels piece, okay I'm sorry. I got ahead of myself. No, I think that's it.

I'll save the other comments -- I think all apply -- I guess some of them are kind of awkward, because they don't necessary fit within a specific category.

But just -- and I think this was mentioned before -- more transparency in terms what is being funded in or out of disadvantaged communities would be really helpful.

And I have a couple more comments related to that kind of transparency and data that I think will come about in the related needs and opportunity section. Thank you.

MR. MCKENNEY: Okay, great. Thanks. And then again welcome.

For those of you who don't know, this is kind of a homecoming for Sekita, because she was the Chair's adviser for many years and has now kind of come back full circle, so it's great to have you hear.

Okay, Tim?

MR. CARMICHAEL: Good morning, Tim Carmichael again.

I'm so glad Jim just mentioned that, because Sekita, I recognized you the minute you walked in. I was trying to place you, do I know you from Greenling? And that just connected some dots for me, so thank you very much.

So just on this point I wanted to make two additional points. One is I agree with virtually everything Joe Gershen said about the need for this category to get more funding. And personally and professionally, if I take a look at the spectrum of what we're doing and where we're trying to go with alternative fuels in California, I think one of the categories that we are the weakest in today is in in-state biofuel production.

If you look at where the LCFS Program wants be in 2020 -- and I think it's a very achievable, admirable, appropriate target -- we are not where we need to be with in-state biofuel production. And each of the subcategories has its issues. For biomethane, there's been a pipeline access issue. For biodiesel, there's been questions about "What can we do -- Is the blend wall real? What can we do to address that, technically, for renewable diesel?" There's a global supply question and how much can we get to the California market if we don't produce it in-state?

But collectively, I think I'm on solid ground in saying we're not where we need to be. And that's for me the reason why this category needs to get more funding.

That said, there is an separate effort that some people in the room are aware of and others may not be to try and secure as much as $210 million in GGRF funding for in-state biofuel production. There was an attempt made this year. It wasn't successful. That attempt is coming back. The numbers might change. The strategy might change, but there is that effort.

And one idea that I would suggest the Commission consider, and this group consider, is upping this number to $25 million or something on that order -- a $5 million augmentation -- with an understanding that by summertime, we should know if this other effort is going to be

successful. And there's flexibility written in to this allocation that enables you to scale it back if that other effort is successful.

So those are my immediate thoughts on this category. Thank you.

MR. MCKINNEY: Thank you, Tim.

Steve Kafka?

MR. KAFFKA: Hi, thanks. Tim's comments and Sekita's comments are actually a good prelude to what I hope to say.

I'm very concerned about in-state production. And I think that the potential benefits of in-state production facility should be a particular focus and help frame the thinking of staff here and in program review.

I thought it was very interesting the discussion that went on around the State around SB 350. A lot of that regulation to try to reduce petroleum use in the State as part of a statute partly failed, and the oil industry certainly was given a lot of credit for that. But part of the reason it failed was because the benefits of the Global Warming Solutions Act were not being seen in rural communities in quite the same way.

So there was a heartbreaking review by Dan Walters that points to the bifurcation, the economy in California between coastal regions, which are doing quite

well and rural areas which are doing quite poorly in terms of unemployment and other social benefits. So how are we going to help those areas benefit more directly from the ambitious program that the state has in AB 32 and then the AB 118 Program?

And by building bio-refineries and energy productions in rural areas, we really help transfer some of those benefits in a very direct and real way. They can be enormously productive economic investments in those communities. But that means that feed stocks -- there are advantages to feed stocks that are produced there.

So, for example, in the Investment Program on page 24, you talk about renewable diesel. Well, renewable diesel is a great thing. If you take fats, oils and greases, convert them to biodiesel, that's great. But if the State creates a program that essentially imports renewable biodiesels from Asia, or wherever, maybe that's a good thing for California, but it comes at a price, at a cost. And why shouldn't those materials be produced where they are used in the first place?

I mean, it's one atmosphere and why import them selectively into California from other sources? So I think that emphasizes the need to, in the allocation of funds to projects, to emphasize in-state feed stock production and in-state localized production.

One other area I would like to suggest that I'm increasingly persuaded by -- partly this comes from recent meetings at the Argonne National Lab in Chicago and Life Cycle Assessment, there's increasingly powerful arguments suggesting that higher alcohol blend technology goes a long way to both reducing greenhouse gas emissions and meeting the CAFE helping car buyers meet CAFE Standards. And it's potentially a cheaper kind of technology and an easier technology to implement and one that allows for lower cost vehicles then for example high priced electric charge vehicles. And for people again, with less funding available to meet.

And it's really not part of either of ARB's Program or it's not really ever mentioned here. And I think it needs to be raised and at least addressed and considered again, the notion of higher alcohol blends. If you were at 30 percent alcohol blends and fuels, you're almost all the way to the Governor's 50 percent petroleum reduction goal with a fuel that we know is easy to produce.

And in fact the pathway for fueling would be just simply raising octane blends at existing pumping stations. So I think that needs to be at least thought about.

MR. MCKINNEY: Okay. Thank you, Steve. And I think our Staff Assessment agrees that in terms of job creation that biofuels is one of the better categories for

that. And because most of the plants are either in the Sacramento or San Joaquin Valley that's really where that type of economic benefit is going. So we fully agree with that.

Let's see. We now have Chris?

MR. SHIMODA: So this is more of a clarifying question for either Joe or staff. I know that biodiesel blending infrastructure was included in prior versions of the plan. Could you clarify or explain the thinking behind -- I think it was either last year's plan or two years ago -- that that funding was discontinued.

MR. MCKINNEY: How about I start, Joe, and you can butt in?

That funding was actually discontinued several years ago. So there was an initial call from industry to do kind of bulk either tankage or blending infrastructure for biodiesel fuels. And we put that out and a couple of the awardees did not really follow through and they weren't real aggressive in building out those projects. And we also didn't hear any more from industry that that was a kind of a critical part of the funding stream.

So we've held that to the present, but we can turn to Joe, if you want to expand on your analysis for Chris?

MR. GERSHEN: Sure. I think when I first joined

the Committee four or five years ago, I sort of complained about this and we talked about the fact that it was under subscribed. And I said well it wasn't really well known that out there in the public. But as times goes by, you know, certainly there have been some retail locations, but where you're really going to see the needle moving is at the distribution location for storage and blending.

We're not talking about necessarily building up marine deliveries from out of the country or even rail from out of the state, because I think it's important to focus on in-state production and distribution infrastructure. It's sort of three legs of the stool: it’s the production, distribution and then retail.

But certainly, you have to have production and distribution infrastructure. And so currently there are about 75 major fuel terminals and racks around the State. About I think ten of them are capable of storing and blending biodiesel right now. That's about 15-16 percent.

I think -- and I don't want to tread too much here into the policy stuff, but I think there's been some reticence to work with the petroleum industry. You know, things like, "Well, the petroleum industry doesn't need money," and that's true. They have their own money, but the questions is the signal that you send to the petroleum industry who are storing, blending and distributing these

biofuels.

There needs to be some way to work with them and get those terminals. They have to see a return on their investment if they're going to do it. Or some sort of help or some signal from regulators in the State that says "Hay, we want you to blend these fuels, these biofuels. These low carbon." In many cases, most of the producers in the state are very low carbon producers. And so we want to see infrastructure so you can blend and distribute the stuff.

That's how you're going to move the needle. And that's what we're saying needs to start happening again. There needs to be some funding for some of that to -- I'm going to call it for lack of a better pun -- priming the pump. I think that'll really prime the pump.

MR. MCKINNEY: Okay. Thank you Joe.

And I think it would be most useful for staff to have really specific recommendations from that industry segment. You know, why is this needed? What's the ask? What's the request? What type of equipment?

And in terms of the petroleum industry, I think with the revision of our 3103 Funding Regulations and Prohibitions, that might make for an interesting conversation.

MR. GERSHEN: Yep, I agree. And I can help with that.

MR. MCKINNEY: Okay. Now I want to turn to --

COMMISSIONER SCOTT: Brian?

MR. MCKINNEY: I'm sorry, thank you.

Okay, Brian?

MR. GOLDSTEIN: Hi. It's Brian Goldstein from Energy Independence Now. I'd like to make a comment directed toward the greater funding category for alternative fuel production. If this isn't the right time, please correct me, but it's relative to renewable hydrogen.

And before making comments Commissioner Scott had mentioned that there is some work going on to take a look at the role of renewable hydrogen relative to this year's funding allocations. Would you mind providing a little information on that?

COMMISSIONER SCOTT: It wasn't actually specific to this year's funding allocations, but it is something I think of it more as in the Integrated Energy Policy Report realm where we're thinking about how our electricity system with the amount of over-gen that it has, has the great potential to make renewable hydrogen for us. Hydrogen can go, as you know, into the either the natural gas pipeline or into vehicles.

And so we have been thinking in part of the Integrated Energy Policy Report -- as we're kind of thinking about where is the State going and how does the

natural gas, electricity, transportation systems are all kind of starting to fit together a little bit -- we're thinking about it in that way. Maybe not so specifically as "Oh, I've got a project in mind to fund through one of these allocations."

MR. GOLDSTEIN: Okay. Thanks for clarifying. You know, I noticed -- and this topic kind of bridges the alternative fuel production infrastructure and possibly related needs and opportunities -- so I'll try to keep it short because I'm sure there's going to be plenty of time to talk under these other categories.

But I noticed that the carve-out for renewable hydrogen was changed a little bit under the infrastructure PON. And I'd like to suggest that more research is needed on the topic as to what policy and market drivers and funding mechanisms would be appropriate to address the topic.

It's tough for me to sit here and say, "Hey, we should allocate $3 million for alternative fuel production -- in the alternative fuel production category to hydrogen," without saying that I think the research is necessary ahead of time to do that. So there are issues, I understand, with if its onsite production would that go under the infrastructure category? If it's simply research, would that go under related needs and

opportunities? But I thought it's kind of spread evenly across so many categories I'd bring it up here and then if there's a more appropriate time to discuss the matter, please let me know.

MR. MCKINNEY: Yeah. Brian, I'm going to suggest that we really kind of put that in the hydrogen discussion, although its formally its infrastructure. But I think that, that might be a good way to help focus discussion on the topic as well.

MR. GOLDSTEIN: Great. Thanks, Jim.

MR. MCKINNEY: Okay. Thank you.

I see no more -- if you could put your name plate down there Brian?

So no more Committee comments at the table, so we're going to turn to the phone -- I don't know who was first, so I'll just take these in the order that I have them -- so Simon Mui, from NRDC. Is he available Andrew?

MR. MUI: Yes, I'm on.

MR. MCKINNEY: Good morning, Simon.

MR. MUI: Can you hear me?

MR. MCKINNEY: Very well.

MR. MUI: Hi. Good morning. I've actually been on for about an hour-and-a-half and finally figured out how to connect via audio to put in comments. But I'm sorry I can't be with you today.

I did have some comments on the alternative fuel production side. And it might be related actually to the earlier comments about oversubscription.

One of the things that is actually in the plan, the proposal, but not necessarily pulled out explicitly is sort of the amount of oversubscription to different categories. And I think just as a Committee member, it would be great to have that sort of side-by-side to the proposed funding allocation. Just so that we understand how the previous years, funds have been encumbered and requests have been made.

But in general, I think I'd like to sort of echo earlier comments about -- as the GGRF sort of funding discussions and the budget come into play, I think it's important, particularly for CEC to continue be nimble in terms of the funding as other buckets come in, so that we are in keeping with the overall sustainable cycles and the air quality and GHG goals.

Certainly we're also aware of (indiscernible) the GGRF side to -- that could help meet these enormous needs a cross the board. And to the extent that CEC is looking at that and keeping an eye on that, but also maybe coming back if needed to adjust those appropriately I think that is a good idea.

Just in terms of the biofuels, we certainly

appreciate CEC's effort around this area. I think, obviously, in all of these categories needs exceed the availability of funds. We certainly have been supportive focusing on ultralow carbon feed stocks, particularly those in California. We think that's consistent with a Low Carbon Fuel Standard, focusing on sustainable low carbon feed stocks that are low in CI numbers. And so with that, I will conclude my comments.

MR. MCKINNEY: Okay. Thank you, Simon. And I'm glad you could join us by phone. I think it's pretty easy to add those oversubscription rates to the Investment Plan. And I know that's not hard to do, so I think that's a good suggestion.

And I think just to echo a little bit what you were saying about very, very low carbon fuels, really most of our investments in biofuels goes to waste-based feed stocks and so we're very pleased with that. So several years ago, the debate was kind of food versus fuel and purpose-grown energy crops in California in what might the impact be? And what might the international indirect land use impact be? And I think we've really moved away from that by focusing on the waste-based feed stocks in here in California.

And the California Bio Mass Collaborative does a great job every year of summarizing the feed stock volumes

that might be available.

And, let's see, I want to turn to John Shears. Are you there John?

MR. SHEARS: Hello, good people. Can you hear me okay?

MR. MCKINNEY: Very well, go ahead, John.

MR. SHEARS: Sorry, my apologies as well for not being able to be with you this morning.

First, I'd like to offer my kudos to the staff and to Charles Smith for providing the template for an excellent draft report.

My comments at this moment relate to the issue earlier of pre-landfill methane and the short-lived climate strategy that's being developed with CARB as the lead agency on that -- raises the issue of insuring the work under the AB 8 Program stays coordinated with these other programs that are sort of being developed through other lead agencies, but I know that the Energy Commission is partnered on those efforts.

And the draft plan that was out for comments has recommended using the 20-year GWPs for methane, so this cuts across both biomethane and the natural gas issues.

And so probably, it’s a good thing, going forward to be using maybe at least two metrics in terms of GWP 100 and GWP 20. In keeping aligned with the short-lived

Climate Pollutant Strategy and the role methane plays in that role. I know the LCFS is still going to be working with GWP 100 going forward.

And then both CARB and the Energy Commission maybe should work out a mutual strategy on how to handle methane sort of in the various guises in terms of how it should be scoring the greenhouse gas reductions relevant to whether credits that are being generated or the appropriate scoring for funding under projects. So I just wanted to highlight that.

You know, in amongst all of these other tensions that the AB 8 Program has in terms of managing all of the demands across all of the different fuel pathways and other programs that it's trying to support, we now have this other added tension of what the appropriate metric will be going forward in terms of the natural gas, biomethane space. So I just wanted to highlight that issue and get us thinking in that space. So thanks.

MR. MCKINNEY: Great. Thank you, John.

Are there any other comments on biofuels from Advisory Committee members here in the room or on the phone?

Seeing none, I'd like to -- see, I don't have any blue cards from public in the room. So if there's anybody from the public that wishes to speak to this? I see a

hand; if you could approach the microphone here at the corner and identify yourself please?

MR. PRIDE: Good early afternoon. I'm Joe Pride. I'm with Wooster Engineering and the Stone Edge Farm Microgrid Project.

And I'm of the belief that hydrogen does need a presence in the alternative fuel category. But it's -- as you've all touched on -- a very finicky category as it sort of bridges between infrastructure, related needs, energy storage, transportation, all these things, but there's definitely an interesting possible nexus there.

One of the areas that we've been exploring and building at Stone Edge Farms has been hydrogen energy storage. But in the bigger picture, in the microgrid world, a lot of us want to have the ability to oversize our solar, because there are conversion losses if you want to move it from one time of day to another. So you want to have some extra to play with.

The utilities don't want to let you do that. And if you look at the distributed resources plans from the three major utilities they want the ability to curtail your solar. What we would like to be able to do is curtail it to hydrogen and have the ability, of course, to fuel it onsite for ourselves. But we're also interested in the development of a 100 percent renewable hydrogen after-

market where there is the ability to sell to a gathering company or fuel on your property, have marketplaces -- these sorts of opportunities where you have hydrogen as an alternative to kilowatts as an economic output from microgrids.

I believe that for these reasons, a marketplace facilitation probably has a place under related needs and opportunities, but that hydrogen definitely should have a place in the alternative fuel production category. Thank you.

MR. MCKINNEY: Can you repeat your name and affiliation again, please?

MR. PRIDE: Yes, Joseph Pride with Wooster Engineering, which is a small firm that probably nobody here has ever heard of. And the Stone Edge Farms Microgrid Project, which is a privately funded project that pretty much lets us build things other people are talking about. And we've already built a lot of it and our hydrogen equipment went in last weekend.

MR. MCKINNEY: Great. Thank you and welcome to our process here.

MR. PRIDE: Thank you.

COMMISSIONER SCOTT: Let me add for our public commenters, if you would give a business card to our reporter right there? He's the one who's kind of making

the transcript. That way he'll be sure to get your name and title and organization correct. That'd be awesome, thank you.

MR. MCKINNEY: Yeah, and for those of you new here, if you can fill out a blue speaker's card that's really helpful to us and it's a way for us to track who's present here today.

So former Commissioner Boyd, did you want to speak to this topic?

MR. BOYD: Thank you, Jim and hello everybody, greetings to a lot of old friends here.

MR. MCKINNEY: It's good to have you back.

MR. BOYD: And a lot of new folks too, so sorry I didn't get my card in quicker, but I presuming I was in the 2:00 o'clock with everyone else. So not topic by topic, but wanted to address was in the biofuels area, which probably doesn't surprise some people up here since I've been at it for oh, 25 or 30 years, in the whole quest for alternative fuels and biofuels.

As I sat here today I amended the notes that I'd written myself earlier today. I've already heard, from the discussion around this table, calls for more attention to other alternative fuels. And, of course, in that are biofuels. And then I just heard a moment ago something that's always been a thought of mine. Alternative fuels

include hydrogen, renewable hydrogen is tied -- like renewable natural gas is tied to this whole circle of connecting all the dots about what the source fuels might be.

So and the talk about that there are some current high payoff strategies that are underfunded, which I choose to interpret as meaning they're not receiving and deserved attention, I think is a very valid point and a concern. And while Mr. McKinney asked somebody to say who he'd take money away from in order to fund his priority I don't think that's a fair question to ask of the members of this group.

I think the policy people at the Commission have to absorb everything they hear and balance it with all the other policy documents that exist in this state and pronouncements of the Governor. And there are many now and you really need to sort out what's in the IEPR, what's in the Bioenergy Action Plan, what's in all the climate strategies, what the Governor has done by Executive Order. And try to figure out short-term, mid-term, and long-term payoff items.

And I do think the biofuels area, in total, deserves more attention. And I was pleased, as I noted to myself, to hear more and more people talking this way. Because while I've heard this over the ten years I was here, we're hearing more of it now.

Sources of biofuels are frankly, rife with major problems in this state. And these are problems to and for California to address. And they can be addressed or even mitigated by the use of these same resources for things like what we're talking about today, energy and fuel. Thus not only meeting economic and employment goals, but all the goals that I've seen on the screen today about what are the goals you're trying to get your projects to address?

And to meet all the goals that I mentioned are out there that you have to try to balance with the decisions that you make for an ultimate plan.

You've got to recognize also this plan, when it's funded is a policy document that others will look to as a statement of the policy of the State. And while you may not have adequate dollars to put what everybody wants in various categories, I think you need to readdress the importance of some of these areas as maybe more short-term areas.

And I came here to speak for myself, just as somebody who's genes pull me into this meeting every year or these meetings. I could've been over at the Air Board or I could've been up at Lake Tahoe with Tahoe Fun Board, but I chose you folks. So this is near and dear to my heart.

And as I read through the report, and I looked at

the gasoline substitutes area, which of course is a very broad area and many of us would like more transparency to see what do you really mean and where are you putting the effort? I'm going to say a very heretical thing, now that I've said in a couple of other forms in the last six months that once again I'm overwhelmed with electricity and hydrogen.

The tremendous investment and the tremendous emphasis, the emphasis is deserved, the investment is if deserved if you just have unlimited funds. But you don't have unlimited funds and you also have to start thinking more and more about near-term, mid-term and long-term.

Now, hydrogen and electricity -- don't get me wrong. I mean, you know, the ZEV mandate was done on my watch at the ARB. I chaired the Plug-in Electric Vehicle Collaborative for my first year of retirement as the only civilian chairman it's ever had. I'm a charter member of the Fuel Cell Partnership etcetera, etcetera. But you've got to strive for balance and you've got to strive for payoffs.

And your Governor has made a lot of pronouncements about the need to reduce dependence on petroleum and solve climate change and let us never forget criteria air pollution, which carried us for decades into this arena. And you've got to recognize the signals that

you send.

So I'm here both as a citizen who has spoken to the broad issue of need for more attention to biofuels, and from the California waste stream. And while Jim said there was an over-concern and infatuation with food versus fuel, to the best of my memory that was never the total intent of the Energy Commission in pushing these commodities as a source for energy.

I mean, we had to inherit corn as a food for fuel, but I think we always said that's a near-term thing and you have to deal with it. And as some of you know, the Commission got punished pretty hard or disciplined heavily by trying to actually help California corn ethanol activities, which you finally got passed and can do.

In any event, the waste to energy is the big thing. It's always been the big thing and you need to pay more attention to that. It just addresses so many issues.

The forest fire issue, I thought when we had the Angora fire ten years ago at Tahoe we'd get some action. And then we've had fire after fire and we are just barely getting attention to all the forest fuel problems that could be used for energy and have been in some cases. That would mitigate fire, that would address watershed protection and water yield in these days of a lack of supply. And so on and so forth with the health of the

flora and fauna in the forest.

And the same thing goes for ag waste and urban waste. And lord knows how we've talked about that down through the decades. So that's my general overall citizen here.

Now, secondly I want to address you for an organization that I'm now associated with called the Fuel Freedom Foundation. It's a not-for-profit founded in California many years old, working all over the country, and purposely ignoring California up until now as a tough place to work in. It's actually based in Southern California.

Former Senator Steinberg and I are the Sacramento contingent representing that group. We're not full-time, it's just something that we're pushing for. And I want to address while they're fuel neutral, they've been working nationally for a long, long time, I want to address two current major emphasis that brought them to California and to seek out old veterans like me and Darrell Steinberg to give them advice and counsel.

One is ethanol in general. The other is E85 or I should say E85 in particular. The idea is to make recommendations and to not endorse any particular fuel, but California has over a million FFVs. And I know from personal experience most people don't even know they have

an FFV or what an FFV is. The few who do might seek out a station that sells E85. But I think we historically have said there's not much there and why should we put any money into it?

All right, your Governor wants action now. you've got a -- there's three legs to the stool, Mr. Carmichael -- and I say that, because he kidded always with my three-legged stools analogies. And when I retired he gave me a three-legged stool. So in any event, it's always been you need technology, a vehicle technology. You need a fuel to take care of that technology. And you need an infrastructure for the fuel.

And then the next tranche may be three more legs on that stool is adequate supplies of all the above, lots of infrastructure, lots of fuel, lots of vehicles. You've got lots of the E85 vehicles running around California. You have lots of ethanol fuel and more coming. And you have an infrastructure, weak as it is, that could be pushed.

And I just want you to think about going to your Governor and saying, "We have now been able to get E85 fuel at a price that's a savings to consumers. And we've been able to advertise to those consumers the benefits. And we can reduce our petroleum use by a significant amount, by getting all those vehicles using E85 all the time."

That's just a short-term payoff that you're going to need to continue the thrust for all the long-term goals that you have. So I'd ask that you think about that.

We have had one discussion with the staff. this is not new to the staff of this Commission. It's not new to Mary Nichols or the Air Board staff, they've been introduced to this. A lot of people are thinking about it and working on it. And I think I encourage you to do same.

If made a policy, it could be facilitated very rapidly and you could get some quick reductions. It addresses all the Governor's policies. It addresses criteria pollutants. It addresses the greenhouse gas reductions, so on and so forth.

Secondly, is just ethanol in general and then I'll get down from here. You can't ignore ethanol in our future. Mr. Kaffka and my friend Steve already mentioned something that your staff has to have observed over the past several months. The automotive industry is quite stressed over how they're going to meet CAFE in the future.

The automotive industry, as we all know, has done miraculous things that they said they couldn't do with automobile engines and their performance and their size and their emissions performance and their fuel economy.

They are talking in many, many circles about the need for more octane: higher octane, higher compression,

greater CAFE, less emissions. Where do we get our octane now -- from ethanol.

I think you need to think about how do you connect all these dots that you've laid out, that I've laid out, and all the problems with the biowaste to fuels arena and so on and so forth, into a program where you make the decisions based on all these policies, absorbing everything the people have said today about how to carve up those dollars. Don't ask these people to knife each other in the back about where they think it ought to be taken from someone else around the table.

But that's the Commission's responsibility and it's a tough one. Ms. Scott has got a tough job just like she inherited from her predecessors, I being one of them in the past. But you don't have a lot of money. You should have more money. At least you have the money and you're going to have to do the best you can and you can do it in concert with other suggestions that have been made about GGRF becoming a source of funding.

And you have to find out where the ARB will draw the line and where the Chairwoman says, "No, we're not going to invest public money into an area where private capital should be invested." I'm not going to discuss that here. You need to find that out from there.

But there are tradeoffs between all you want to

do, they want to do, and between the ultimate goal of hydrogen and electricity, but all the stepping stones in between and all the renewable sources that can provide for that electricity and then hydrogen. So I ask you really, to take a long hard look at this.

There are massive investments in areas now that have very few vehicles, extremely weak infrastructure, and limited amounts of the energy you need for the fuel. Not so true with electricity, certainly very true with hydrogen. So think about where you're investing your money. As much as you'd like to dump it all into maybe the ultimate utopian goal, but think about how you need to incent other areas. And how statements you make in your policy document give guidance to other people.

Where the State government is willing to step out, we the private sector, might be willing to step a little further into the Valley of Death and make an investment where heretofore people have been reluctant to. A lot of people have said to me, "Well, the private sector's supposed to pay for all that." Well, we had a recession. The investment community really retreated from a lot of these areas. Some investors overinvested in some areas and poor mouthed those areas for a long, long time.

This government has to venture deeper into the Valley to attract these people back to make that

investment. So that's what you have to do with the monies you have. And as I say, you know, to me the biofuels arena is probably the key arena where you affect all the other arenas, because it becomes a source of supplies for energy to fuel almost everything.

Thank you for allowing me such a long time to make my comments.

MR. MCKINNEY: Great. Thank you, former Commissioner Boyd. It's always good to have you here.

Let's see, I see that Steve has put his name plate up and -- sorry?

COMMISSIONER SCOTT: I still have something --

MR. MCKINNEY: And then Andrew, we have one person from the public who wants to speak on biofuels. Is that correct? One, okay. Right, why don't we go to --

COMMISSIONER SCOTT: Also I do want to be actually mindful of our time, because we do have the rest of the categories that we need to talk through. And so we'll go to Steve, we'll go to Joe, we'll take our public comment. And then we'll probably break for lunch and then we will come back and do the next category.

And please remember anytime, of course, you can give us written comments as well. So that if you didn't have a chance to finish everything you wanted to say we'll be able to get those in writing to you.

So go ahead, Steve.

MR. KAFFKA: Biofuels are always often the most contentious and interesting topic area generally.

COMMISSIONER SCOTT: Yeah.

MR. KAFFKA: So I really appreciated what ex-Commissioner Boyd had said. And it caused me to think about one other thing.

The Federal Renewable Fuel Standard effectively, from my perspective has crashed and burned as an incentive. It's become instead of a mandate, a kind of a yearly allocation political battle. And basically it's almost a negative incentive now for investment in the alternative in advanced feed stock sources and new policies for advanced ethanols or for other biofuels. So it means that the LCFS in California particularly, and for other jurisdictions that adopt it -- and the AB 118 Program and related programs carry even more weight. So I think it reinforces what Jim has said, that you do have a policy effect here in terms of your allocation.

And balancing that with mid and near and long-term needs is important, but we do want to get to a significant petroleum reduction in a short period of time. And so I think that also supports some of the things that Commissioner Boyd just said.

MR. MCKINNEY: Okay. Then Joe, you had a short

comment?

MR. GERSHEN: Very short, again from ex-Commissioner Boyd. I think just going slightly off the reservation on an emotional plea, in addition to all the documents and policies that he suggested that you have to look to, to make these decisions I think it's important to note 2014 was the hottest year on record. 2015 is on track to be hotter than that and we've just lived through this summer, which ended November 1st. We talked about that before the meeting.

I think we had the strongest hurricane on record a few weeks ago hit Mexico. There was a really strange cyclone hitting Yemen, South Yemen, and doing massive destruction. I mean, we're all seeing these things. I think you just have to go outside or watch the news and see what's going on.

We've got to lower carbon and what's going to do it most effectively? And I think that's a certain driver that has to be considered. And Mr. Boyd is correct, I think you guys have to make those decisions, but these are things that are important to consider, but thanks.

MR. MCKINNEY: Okay. Thank you, Joe.

So Andrew, do you want to open up the phone to John Reed?

MR. REED: Hi. This is Dr. John Reed from North

American Repower. Can you guys hear me?

MR. MCKINNEY: Yeah, very well. Please proceed.

MR. REED: Okay, great. Yeah, I'll try to make this very brief. I just wanted to make a couple of quick comments about biomethane and the reduction in its value on the Low Carbon Fuel Standard.

Understand that those adjustments made by the staff at ARB were based upon some studies that were done on older lines and from a few production areas outside of California. And that when it comes to biomethane utilization in California those reductions actually don't reply, because until very recently the only biomethane that could be used as a vehicle fuel was from places where it was onsite produced. So the leakage amount from an onsite production would be extremely small, because you're not using the national pipeline. You're not using the compression, so the value is actually very high.

But thanks to the efforts of Mr. Carmichael there and the Renewable Natural Gas Coalition the Hayden Amendment was finally modernized. And now we can have pipeline quality biomethane finally placed into the pipeline here in California that's produced here in California.

So a lot of things are finally coming together, so that biomethane utilization in California can actually

finally try and catch up to the kind of numbers that we're getting from biodiesel. You know, biodiesel's had a ten-year head start on being able to go to market here in California that biomethane's not had. So things are finally coming together, so I would ask that the CEC seriously look at natural gas cooling infrastructure in terms of addressing the issues that the utility companies, the pipeline owners had about biomethane going in. And help reduce the cost of biomethane production by helping fund research into items that can help clean up biomethane, so that it can become pipeline quality. And to reduce the cost of that technology.

I think the other thing that goes hand in hand that I'm not really seeing here, and it has to do with training, for individuals for both hydrogen and for natural gas. And that comes to vehicle inspectors and these sort of things. You know, we're looking at tanks that are going to be at 10,000 psi and these little Mirais and any other hydrogen fuel cell vehicles that come along. And there's very -- almost no people that are certified to be able to inspect and deal with these systems.

And the people that would be willing to do that and want to do that, they have to pay out of their own pocket to get that training. And I would suggest that we seriously look at putting some scholarships available for

people that want to learn and have that sort of training.

And lastly, looking at emerging opportunities the Energy Commission should be very proud of itself, of its investment that it's made in natural gas technology.

The fruition of that is the Cummins Westport GL .02 NOx Engine that's going to be available now. That's a phenomenal amount of technology and the Energy Commission has also funded my own company with -- and we're developing technology which will have similar if not better results, and not only in terms of NOx but in terms of greenhouse gas production.

And I see in the current plan that pretty much all of the money is going to be going towards stuff that is near commercially available or in vehicle buy-downs for currently available. I would suggest that we not lose sight of what the CEC funding has created by investing in things that are not yet near commercial available. And to make sure that funding is available through emerging technologies that can take us even further with biomethane and the natural gas that's available to us.

That's all.

MR. MCKINNEY: Great, thank you for your comment. And thanks for participating in our proceeding.

I think with that we're going to break for lunch. This is a kind of a good natural break end of the biofuels

discussion. I really want to thank the Committee members for some very thoughtful discussions.

Kyle, you're pointing at me. You're pointing --

What, are you between us and lunch?

MR. FREEMAN: Sorry, I have a boring quick housekeeping item before we break for lunch. As soon as this over they're shutting down the Internet service to fix some of the wifi, so you'll have no access. But when we all come back it should be working flawlessly, and so the folks that are online, you may see the system go down briefly but we'll be back.

MR. MCKINNEY: That's an important item. Thank you, Andre.

Okay. We will reconvene at 1:30. Thank you.

(Off the record at 12:35 p.m.)

(On the record at 1:33 p.m.)

COMMISSIONER SCOTT: So we have finished our discussion on the Biofuels Reduction and Supply Category and are going to go to now the Electric Charging Infrastructure Category. So while I'm waiting for Jim I'm going to ask who of our Advisory Committee members around the table would like to start the discussion there. No comments on Electric Charging Infrastructure?

Oh, Sekita?

MS. GRANT: Yeah. I guess I kind of already made

some of mine. Let's see if I actually have any more than what I already said.

So I guess just to reiterate the support for the Energy Commission thinking innovatively about the multi-unit dwelling issue, and that having a point person or persons that are really engaged with how to get additional charging in those areas and thinking kind of more deeply about that problem.

And it kind of goes into the earlier conversation with Jim about finding the right geographic regions, which -- maybe the solution to the multi-unit dwelling problem is to ensure that there is more publicly accessible charging stations in those areas where there is a lot of multi-unit dwellings.

And also thinking about using funding for focused pilot programs that might -- where you're kind of leveraging the Energy Commission funding -- what the program you have with the Department of Finance. What the Area Resources Board is doing with incentivizing vehicle purchases, particularly their supplemental incentives that will be available for low and moderate-income purchasers. So having, collaborating, and kind of leveraging those different options -- both leveraging the financing and the money available as well as the information.

I think all of this is a really great opportunity

to inform potential purchasers and users of these clean-vehicle technologies that might not necessarily be in our circles. And it's really about us moving beyond early adopters in getting more non-traditional partners into this space.

I think that's it for this section. Thank you.

MR. MCKINNEY: And Sekita on that point -- Erik I don't know if you or Peter maybe can add -- but where are you on the pilot program for disadvantaged communities and vehicle deployment with AQIP? Is that on hold as part of the GGRF Funding that's on hold or is that proceeding?

MR. WHITE: Well, the projects that the Board approved with last year's funding, we're in the process of implementing now: some low-income financing programs for disadvantaged communities, car-sharing as well. I think there's a number of press announcements about a program in Los Angeles that just was approved by the city of Los Angeles. And I think it was San Diego, wasn't it Peter, the other one? Yeah.

So those are moving forward. Obviously we did not get our full appropriation of low-carbon transportation funding that the Governor had proposed in his budget. We're cautiously optimistic that additional funds will come after the beginning of the year.

So the new projects that we had proposed in our

funding plan last year, which would build on the ones that we had done last year are on hold pending additional funds.

MR. MCKINNEY: And if you could remind us please, did those pilot projects in disadvantaged communities, do they include charging infrastructure? Because I know at the staff level we've talked about trying to coordinate our respective programs.

MR. WHITE: Infrastructure was eligible with those, so a number of them have charging -- an infrastructure component associated with them. And some of them are quite novel, similar to Commissioner Scott's curbside charging -- some of them. I think the City of Los Angeles one is intended to demonstrate using existing infrastructure like the light posts as a way, as a source, of electricity for charging the vehicles.

I'll look to Peter again and make sure I have that right. Is that? Yeah, yeah.

MS. GRANT: I'm sorry, just a couple of more follow-up points on that. And I know that you guys are already doing this, because I could tell but when I read through the documents -- the Draft Investment Plan. And it's for us stakeholders to also help with this, but kind of keeping up to speed with the PUC and the rollout of the charging stations there as well as what NRG is doing.

And the Japanese company -- I'm blanking on their

name -- their MOU, what they're doing. I know you are all aware of this. And --

MR. MCKINNEY: NEDO, yeah. NEDO?

MS. GRANT: NEDO, that's right.

And as Erik mentioned the City of L.A. is also leveraging funding from LADWP for charging stations. So outside of the IOU territory POUs are also looking at charging stations. And we've connected them with CEC staff to make sure that in terms of placement that they're taking advantage of some of the planning work that you guys have already done.

And then, again to reiterate the potential to get more information in terms of where investments are happening relative to disadvantaged communities. So what's going within disadvantaged communities and what's going outside of them?

COMMISSIONER SCOTT: Great. I will just add to that that we are especially in this area working to be incredibly flexible and incredibly nimble as we go forward, because it is changing so fast just as you mentioned with NRG. With the NEDO we don't know exactly what their PUC's going to do, but they're going to do something. And so we need to make sure that the Energy Commission's investments in this space continue to be strategic and continue to advance the charging into spaces where we're not

overlapping with a PUC effort with something NRG is already doing. And so we're very mindful of that going forward.

And I'll take this opportunity to do another plug for our workshop that we're going to have on December 7th, Commissioner Peterman and I. And we will go through many of our regional readiness plans to really get a good sense of what folks in the regions, in the local cities, are doing on the ground to plan for charging infrastructure. How they are doing that planning, where they are doing that planning, why they are picking the areas that they're picking, to really kind of get some more detailed understanding of the different thought processes that folks are using as they are putting the charging infrastructure out there.

I think with the amount of charging that we need to meet the goals that the governor has laid out for us, $1.5 million by 2025, we need all-speed ahead in all of those areas, so just random thoughts to add.

MS. GRANT: Can I add -- sorry, one more thing I promise -- my last statement was just to make the point as we're -- especially in infrastructure, so this goes to electric vehicle infrastructure and beyond -- that there are really a lot of great opportunities in terms of the economic benefits of investing in infrastructure within different communities.

And also these great events that you guys are having to celebrate this new infrastructure rollout are also great opportunities to bring community participants in, bring non-traditional partners, community-based organizations, schools. Get them engaged in this exciting rollout. So it's a way to kind of -- almost like a PR opportunity as well as actually having the economic benefits of investing in different communities.

MR. MCKINNEY: Great. Thank you, Sekita.

And Randy was reminding me that part of our CPCFA Pilot Loan Program is that we do offer, I think, is it bonus funding or bonus points?

MR. ROESSER: Incentive.

MR. MCKINNEY: Incentive funding?

MR. ROESSER: Incentive, yeah. (Indiscernible)

MR. MCKINNEY: Yeah, for chargers located in disadvantaged communities.

And is Thanh or Jennifer Allen in the room? No.

But I think adding that to the metrics that we track, the geographic location, how that fits in a EJ zone or something through CalEnviroScreen is pretty easy to do. So thank you for those comments.

Let's see, I've got Chris and then Bonnie?

COMMISSIONER SCOTT: Actually that's Ralph.

MR. MCKINNEY: Sorry?

COMMISSIONER SCOTT: Ralph.

MR. MCKINNEY: And Ralph, I'm sorry, I can't read my own writing: Ralph, Chris and then Bonnie.

MR. KNIGHT: Thank you. I just want to thank the Commission on what they're doing as far as the infrastructure for chargers. We have not been successful to date to get some money to do it, but we have put solar charging on eight of our school sites. Eventually we will have all school sites solar-charged. So with those eight sites we included charge stations, two charge stations at each site. And so we're going to roll those out and push those out to the public.

And to employees, we've got some people that do have electric cars that work there, but each one will have two chargers out there. And the District is not going to charge for it, it will to be free of charge, because we figure you're talking about an employee that parks there it's going to cost maybe a dollar with the solar to be able to charge that car. So to us you can't buy the PR that that could bring.

And I think that's -- you know, the Napa community we get hit on a lot of different things, we don't have a whole lot of disadvantaged in the area, so when it comes to funding things we pretty much get thrown out of the mix. We're seeing that as far as our electric buses

are concerned too, that it's pretty tough for us to get the funding to do the electric buses the same way.

But the charge stuff right now is on a full, fast forward mode and the District is moving as quickly as possible to do all the school sites into solar and we'll have chargers at all schools.

MR. MCKINNEY: Great. Thank you, Ralph.

Chris Shimoda?

MR. SHIMODA: So just to tie into the earlier conversation about the additional policy overlays on this particular Investment Plan. As many are probably familiar with the Governor's Integrated Freight Plan there were targets just recently announced last month -- a 100,000 zero-emission vehicles or equipment in the freight sector by 2030.

So with that in mind and also given that it looks like the first sectors to try to incorporate this technology are likely going to be electric standby transportation refrigeration units, refrigerating trailers, Class 3 through 6 smaller-type parcel vans is there any consideration for kind of a commercial strategy on electric charging infrastructure?

I know that there's a lot of limitations about public availability. That's going to be a challenge with some the dock bay infrastructure, for instance, but

publicly available pedestals, that sort of charging infrastructure? Because I do believe there is probably going to be the need for some of level of incentive funding. I know their Resources Board has some programs tailored towards doing combination equipment and infrastructure, but has there been any discussion in this program? Because I know the statute calls for truck-stop electrification, but not kind of privately-held-but-publicly available infrastructure.

MR. MCKINNEY: I don't see Jennifer -- I know Leslie is out today.

I do know that for our medium, heavy-duty advance technology demos that we do provide funding for charging infrastructure there. And it doesn't have to be public necessarily if it's a closed-fleet operation. And we've talked a lot about kind of adding this element to this particular funding category, so light-duty electric charging infrastructure.

So thanks for the comment. And if you can articulate that more in written comments I think that would very helpful. And Commissioner do you want to add to that?

MR. SHIMODA: And just -- oh, sorry.

COMMISSIONER SCOTT: (Indiscernible)

MR. SHIMODA: I was going to say just one quick comment. Is that specific to refrigeration units you will

have times where the facility owner actually does not own any of the equipment. And so kind of disaggregating the charging infrastructure itself from the equipment is going to be important.

COMMISSIONER SCOTT: Great point.

I think we are also working with some of the ports here and thinking about the different equipment around the ports that can also be electrified, and maybe not all the ones that are most obvious to people.

But of course I'm blanking on all of the different types of technology, but we're working with the ports to also kind of see what other types of things at ports can be electrified. And do it in such a way that other ports would then be able to model it, because you've got a good total cost of ownership or something like that there. That makes it so that you have a good rate of return.

MR. MCKINNEY: Bonnie?

MS. HOLMES-GEN: Thanks. I'm happy to jump in this discussion. As you know the American Lung Association is very excited about the transformation that's happening to electric vehicles and infrastructure. And very excited about the goals the State has set. And the urgency is very present right now. There's a lot of urgency to move beyond the 150,000 electric vehicles we have and ramp up quickly.

In terms of the goals that we've set it seems like we need to maybe clarify. In the document it's talking about 1 million EVs by 2020, I think. And we have the 1.5 million by 2025 is, I think, the ZEV Strategy Goal. And now with the Mobile Source Plan it looks like there is some exciting numbers about moving to over 4 million or 40 percent, I think by 2030.

So I think it might be good to take a look at the goal that we're putting forward here just so we have that goal clear. And, of course, I think it looks like we're setting some higher goals now in terms of the Mobile Source Strategy and the SIPs that will be worked on with this, the implementation plans for ozone.

So from our perspective it looks like we do need to ramp up. Of course, we've done a lot of great work -- that's done on infrastructure. We need to be continuing to ramp up.

We would question the amount of money. That $17 million is a great rate-continuing allocation here, but couldn't we possibly look at more money in this category also? I know we need to track all the other expenditures that are going out for infrastructure, but it seems like there are special needs. We've just talked about the transition to electric vehicles in the freight sector. And there are some special needs for electric infrastructure to

help that freight transition.

And so that might be helpful to have a section, also, in this document that's talking about those unique needs in the transition to support just the Sustainable Freight Strategy, because it is maybe a little different than just public chargers for passenger cars.

So wanted to mention, specifically, looking at the goal is it high enough? Is it the best goal that we have to put in this plan? Is the money enough for infrastructure? Especially with the needs in the freight sector we know there's a need to boost it up, it's just a matter of where it's going to come from. Is there is more that could come from our CEC pot?

And in terms of the city and county, local government support, I'm really excited to hear about the workshop that you're hosting. We think it's so incredibly important to have local leaders even more engaged, to have local champions.

We're really particularly interested in looking at what more can be done in terms of local, city and county fleets. And trying to encourage cities to really be leaders in this area and to do everything they can to ramp up their own investment and show themselves as leaders and models in the transition to zero emission.

So we will definitely be part of that discussion

and we're working with our local offices to see how we can be more engaged in those local efforts to ramp up also.

So I'll probably have some more comments later, but I just wanted to toss those out right now. Thanks.

COMMISSIONER SCOTT: So that reminded me of a couple of things.

We are working closely with the Department of Defense. It's kind of a Chair Weisenmiller, Secretary McGinn at Department of Navy effort. We're working closely with our friends at the Air Resources Board and other state agencies.

And one of the things that has come from that partnership is the Department of Navy is going to transform all of their non-tactical vehicles in California to zero-emission vehicles. And they're looking to do this by I think -- I can't remember exactly when the RFP is coming out, maybe about the beginning of the year -- they are looking to have that fleet going by summer. And that's really exciting.

And so I just wanted to pick up on your point about fleets and being able to use those as models. It's something that they have put a new leasing model in place that allows them to be able to do this. It gives them a little bit more nimbleness than they have if they have to own the vehicles.

And so that's something that once it kind of gets going we would like for them to come back and they can talk to not just to the California fleets, but they could talk to fleets across the country about how put they put that modeling in place, because it's a different model from how they typically got the vehicles. And so it's pretty cool that they're doing that.

I also wanted to underscore what you said about the Clean Air Goals, because a lot of times we've talk about 2030, which is our Climate Goal. But we've got 2023 coming up not so far away. And a lot of the solutions that we're talking about across all of these categories have the potential to help us to meet those 2023 goals as well.

And that's something that the Energy Commission is also very mindful of when we're thinking about what types of projects we might like to see going forward.

MR. MCKINNEY: Any other comments from Committee members here? I want to turn to the phone so --

MS. HOLMES-GEN: I'm sorry, but if I can just make one more comment, which I really wanted to underscore the importance of the comments that have been made around disadvantaged communities and partnering with ARB. And trying to focus the funding and trying to support lots of different ways of helping communities across the State to participate in this transformation and so part of it can be

locating EV infrastructure.

But there's lots of other ways to promote electric vehicles, electric buses, electric transportation, car sharing; lots of different forms of electric transportation in diverse communities, so I just wanted to pipe up and support the comments that Sekita made and express that that's a very important goal also.

COMMISSIONER SCOTT: That reminded me of one more thought, which is we have put together a map of all of the ARFVTP projects across the State. And it has different icons for whether it's a biofuels project, an electric vehicle, a medium and heavy-duty.

I'm not sure if you can overlay CalEnviroScreen, so if you can't we'll figure out how to get that layer on there. But you can overlay the -- although it's probably not quite as relevant as it was when we first built the map -- of the old legislative districts, the new legislative districts, the air-quality management districts. The county lines and all that stuff are already on there.

So you can kind of see which types of projects are going where and you have some different layers that you can use to kind of analyze what's what. So it's a great resource and it's up on our ARFVTP webpage. And the easiest way to find that is at the top of the Energy Commission webpage we've got that transportation tab. And

when you click on that you can get to all the transportation-related stuff.

MR. MCKINNEY: And also Commissioner can you confirm the date of the Regional Readiness Planning Workshop?

COMMISSIONER SCOTT: Yes. It's on a Monday, December 7th. And I do not recall off the top of my head the start time -- 10:00 a.m. Stay tuned, the notice will come out in a couple of weeks.

MR. MCKINNEY: Okay, I'd like to turn to Advisory Committee members on the phone, so we have Simon Mui.

MR. MUI: Hi, thank you. Hi, Commissioner Scott.

I wanted to just say I look forward to meeting all your new staff -- and I'm excited to hear -- next time in person.

I did want to just comment on the electric transportation sector. In general, electric transportation when we look at the mobile source goals in terms of air quality, GHGs and petroleum reduction, I mean it's clear that electric transportation is going to be a major, major part of that. And the needs around not only light-duty, but medium, heavy-duty, off-road electrification, it is very clear. And to the extent that this is a very vital bucket and could always use more resources I agree with that.

In terms of the comments I have the fortune of going after my colleagues over there. So I will just only echo Sekita's comments around the focus around multi-dwelling units, how helpful it will be to have an expert adviser to help identify areas and facilitate charging and location and siting.

In terms of the different discussions about both where the PUC, ARB and CEC is funding it would be very good eventually to have a full, I guess, California-integrated map between the agencies of where are the chargers and what types are being deployed where.

And I would just like to note that being engaged in the PUC from NRDC, the PUC process right now with the IOU submissions, it's just from our own experience we know that the PUC is very thoughtful. And they have got a long process, so that even though you hope that the money will come out by next year the programs don't always go out the door over at PUC at warp speed. So certainly over the next year in this fiscal cycle it does seem that CEC will remain one of the main funders in this area.

And hopefully the other part is that we're hoping that as IOUs move forward MUNIs (phonetic) will be fast followers or in parallel. But those MUNIs, those territories we agree with CEC will still have very large needs, going forward around the infrastructure.

And then last I'll just comment, sort of echo actually Chris Shimoda's comments about also making sure that we are thinking about the medium, heavy-duty demo projects and the deployment and how infrastructure can play an important role there. So again I'd just like to emphasize the strong needs in this category and encourage CEC's plan here.

MR. MCKINNEY: Great. Thank you very much, Simon.

Next we have John Shears.

MR. SHEARS: Good afternoon. So, people can hear me?

MR. MCKINNEY: Very well.

MR. SHEARS: Great.

Yeah, I just wanted to -- my thunder was stolen, but it sounds like several of us are thinking along similar tracks when it comes to making sure that we continue to keep our focus on what happens in disadvantaged communities. And how to coordinate deployment efforts that are happening between AQIP, low carbon transportation funding, AB 8 funding at the CEC, and the staggered rollout of the pilots that are under review through the PUC right now -- noting that not all of the pilots are at the same stage of vetting through the PUC processes: basically, SPG&E before FCE before PG&E in terms of the service

territories and when those pilots will roll out. So I think it's going to be important.

As Simon noted for the Energy Commission they keep funding projects. Once the pilots come online it will be more challenging trying to keep track of what is going where, but certainly I think that will be important work.

And in the meantime through the Energy Commission's funding and through ARB's side of the funding through the disadvantaged pilots etcetera, I think it will be important to coordinate what charging infrastructure is going in where. Not only just for keeping track of the overall picture, but I think for also future planning of projects to serve disadvantaged communities. And matching what infrastructure has been deployed, where it's been deployed and how that syncs up with the prevailing vehicle technology as the next generations of EVs are deployed in the market.

I was just thinking there's the very useful map that I think was part of Jim's presentation this morning, showing where the various chargers are located. And I was wondering if it might be helpful to get a little more granular with that type of data vis-a-vis the way that Tyson Eckerle has helped developed in terms of presenting how hydrogen fueling stations are moving through the deployment process.

I was wondering if it might be helpful? I think it would be helpful in fact, if we could have something similar, at least for the ARB and Energy Commission-funded projects, at least for the time being. I think it will help out a lot with the future planning especially on the disadvantaged communities' projects going forward.

I know in advising some groups that were interested in participating in seeking funding for disadvantaged pilots it was the kind of information that would have been very useful for purposes of planning past proposals and probably future proposals as well. So thanks.

MR. MCKINNEY: Great. Thank you, John.

Any other comments from Advisory Committee members, either here in the room, or on the phone?

(No audible response.)

Okay, with that are there any public comments here in the room today? I don't have any blue cards. Seeing none, Andrew, do we have any public comments on the phone for this subject area?

One, go ahead. And hang on, as a friendly reminder to everybody for public comments we generally try to keep them to three minutes, so proceed and if you can identify yourself?

DR. REED: Appreciate it, yeah. Yes, this is

Doctor John Reed again with North American Repower. I just wanted to get back to the comment made about the metros going to electric.

You know, the metro systems here in California are heavily invested in natural gas, several thousand units in L.A., several hundred units in San Diego County.

And just in my conversations with the Head of the MTS here in San Diego, ARB is basically dictating to them that they go electric with withholding the 20 percent funding that these districts rely on to be able to get their new buses. It's 80 percent Federal funding, 20 percent State.

Now, problem is there's no money in there for infrastructure for these folks. And the infrastructure costs will be massive, because you are looking at urban areas where these would be the most effective. And the cost of doing this is extremely high. Most of the facilities for these metros are also very old. And the infrastructure just to tap into is not up to snuff. So we're looking at a massive investment in infrastructure for systems that have already made major investments in the natural gas.

I think that you really need to look again at what it is you're attempting to do and get fixed here. And I think you really need to involve the MTS people at the

highest level in all these discussions. And I'm sad that they're not here and discussing this right now, because this is the biggest problem facing them right now that the mandates for them to serve the public is increasing yet that the funding for them to get new buses is actually being pulled away from them.

For MTS San Diego they have no ability to use electric buses, period. So with the only funding available for them is for electric buses they will basically go without buses and they will have to reduce service, which is completely contrary to what we're trying to get done. So that's my only comment.

MR. MCKINNEY: Great. Thank you, John Reed.

Next I think we have Urvi Nagrani with Motiv on the phone. Go ahead, Urvi.

MS. NAGRANI: Hi, I just wanted to make sure that when we're talking about electric-charging infrastructure, make sure that the public accessibility isn't included in all funding for electric charging infrastructure.

Specifically, as we're looking towards the medium and heavy-duty side, a lot of fleets keep their vehicles parked in work yards that are locked up. And so if all of the infrastructure funding that is available for them has to come with public access it means that they're basically going to look at it and say, "Well, I either have a choice

of my business being secure and having my trucks in the yard or not being secure."

And we don't really want to make fleets make that decision, so I'd urge especially on solicitations where the infrastructure is necessary not just considering infrastructure as a match fund, but as an eligible expense.

And then when thinking about funding electric-charging infrastructure perhaps differentiating the bucket of requirements for those chargers that are intended for multi-unit dwellings, for public access, and the light-duty sector from those that are intended for the heavy-duty sector and are going to have to work with specific charging protocols on those heavier vehicles.

MR. MCKINNEY: Okay, thank you.

Let's see, I have one more card then I'm going turn it over to the Commissioner.

Erin Evans, are you present here? Okay. Hi. Welcome.

MS. EVANS: Hi, thank you. I'm Erin Evans with the Small School Districts Association.

We're very supportive of the $23 million for medium and heavy-duty vehicle demonstration project. I understand this funding can be used to get clean school buses on the road as well for charging infrastructure.

MR. MCKINNEY: Yeah, I'm sorry ma'am, if I can

interrupt you?

MS. EVANS: Sure.

MR. MCKINNEY: I thought you were going to be speaking to the electric charging topic?

MS. EVANS: The vehicles.

MR. MCKINNEY: Yeah, so that will be --

COMMISSIONER SCOTT: We'll come back to you when we get to the vehicle part.

MR. MCKINNEY: Great. Thank you.

COMMISSIONER SCOTT: Let me -- oh, I'm sorry. Go ahead.

MR. BOYD: Jim Boyd, I'm sorry not to -- I had a question that maybe, particularly you Commissioner Scott, could help with. It may or may not inform a little bit of the discussion.

During my year as Chairman of the Plug-In Electric Vehicle Collaborative we struggled mightily with great strain to come up with three major priorities instead of the previous years' laundry list of priorities, one of which was multi-housing, multi-unit dwelling charging. With a pretty ambitious program recognizing it's an extremely difficult field to operate in.

And I've drifted away from that and I'm just wondering if they were able to execute enough -- you, as chairing that now -- have they been able to move that

forward with any success? Or how does that effort fit into what's being talked about here? The need for additional funds and the need to do this, that and the other, some of which I had hoped frankly by now had been done. But nothing seems to go as we had all hoped.

COMMISSIONER SCOTT: There is at -- the Plug-In Vehicle Collaborative has put together some really excellent case studies and in addition a kind of a handbook for people who are looking to get multi-unit dwelling charging. We haven't kind of put a goal out there or done something like a "Drive the Dream" where we were focused on the workplace-charging aspect for multiple-family buildings.

But what they have done is put together just some really good information for if you're the apartment building owner here's how you can get going on charging, here's the different resources that are available to you. If you are a tenant living in one of these buildings here's how to approach your HOA, here's how to approach your landlord on how to get the charging in place.

And so they put together some really nice materials to help people understand how to get involved in the space whether you're the building owner or the person that lives in the building. So we do have some really great brochures from the Plug-In Vehicle Collaborative on

that. And those are probably, I would bet, up on the webpage.

In terms of like a specific goal though on multiple-unit dwellings, we don't have that at the Plug-In Vehicle Collaborative.

So in our notice we said that we would take public comment at 2:00 o'clock, so here's what I'd like to ask. If there was someone who was 100 percent absolutely counting on the fact that they were going to be able to say something at 2:00 o'clock and you urgently need to do that would you please be sure to let us know? We're happy to take that comment now.

Otherwise if you have a broader, general comment I'd like to ask that you wait until the end of the meeting. We will certainly take public comment at the end of the meeting. Please don't think that we are forgetting you, but I did want to put the opportunity out there if there was someone urgently depending on that 2:00 o'clock timeline.

Any hand raisers over there, Andrew? Okay, let's do that one and then we will go back to I think the Hydrogen Refueling after that.

Okay. So I think Andrew has opened up your line, so the urgent commenter please go ahead. He didn't tell me your name, so you'll have to identify yourself.

MR. LADY: Bill Lady?

COMMISSIONER SCOTT: Bill Lady?

MR. MCKINNEY: Bill, is your phone unmuted?

(Audio difficulties.)

COMMISSIONER SCOTT: Okay, so we're going to go ahead and move on. There is an opportunity, of course, to put in written comments. We look at all of those.

And let us go now to, I believe we finished the electric charging discussion from the folks around the table?

MR. MCKINNEY: Correct.

COMMISSIONER SCOTT: Terrific, let's go on to Hydrogen Refueling. Who would like to start?

MR. MCKINNEY: Erik.

MR. WHITE: Thanks, Jim. I think it goes without saying the ARB is very supportive of this year's proposal for an additional $20 million to hydrogen infrastructure.

As you laid quite nicely in your presentation as we envision growth in the light-duty hydrogen fuel cell marketplace it's important to have the stations online and available to fleets if we're going to see the success in the deployments that we're looking for. It's very encouraging to see just how far we've come in such a short period of time in terms of the number of stations that are out there.

I actually had the opportunity to see the Emeryville station about a month ago and was just very impressed its access and ease of ability to use. And it wasn't bad seeing one of the new Marais there as well. It's a very nice-looking car.

So we're very supportive of that. And certainly as you projected forward and started to identify areas in which we may have localized impacts from lack of availability and some broader, statewide issues moving forward it's going to be very important for us to work very closely to ensure that as we identify those future bottlenecks or areas that we need to look at that.

We're looking at those and working on those very closely and understanding how we will bridge those areas so that we see continued growth in this marketplace as it's going to be so critical to meet the Governor's 1.5 million vehicles goals. So thanks.

MR. MCKINNEY: Great. Thank you, Erik.

And I will remind us all that we just have a very strong and collaborative working relationship with your hydrogen team. So we had good input into your report. And Andrew Martinez is on every conference call that I have with NREL on our report, so it's a good working relationship.

Tim Carmichael?

MR. CARMICHAEL: Good afternoon, Tim Carmichael with the Natural Gas Vehicle Coalition again.

I am also supportive of -- let me preface this by saying I'm speaking as a member of the Committee rather than for CNGVC on this item. I'm supportive of this allocation this year mostly because I was part of the negotiations that led to a commitment for at least three years of funding at this level.

But I want to take this opportunity to remind everyone, because there are a lot of new faces around the table, back in 2013 as part of the AB 8 discussions and negotiations, there was a discussion involving Commissioner Peterman, myself, Tom Cackette from ARB and others where we basically hammered out that there needed to be a strong showing by the state committing to infrastructure if we were going to push the auto industry as hard as we were pushing them on fuel cell vehicles.

ARB wanted a $100 million firm commitment and we ended with $60 million; $20 a million a year for three years. If you look at AB 8 today it doesn't articulate that, but I think several people will remember that's how it played out.

And what the bill says is, "CEC in collaboration with ARB needs to review this funding every year and make an evaluation on the appropriate level."

I am not in any way advocating that we cut the hydrogen funding out of this program. I am reminding people that this year is a very big year for this line item, in my mind, because assuming the Commission goes forward and approves this, this will be that third $20 million installment for a total of more than $100 million in hydrogen infrastructure funding.

But a year from now, in theory, we're going to be having this conversation again. And we're going to, and the Commission is going to be needing to take a hard look at, does it make sense to continue this funding at this level?

And the reason I raise it now is because the balancing act between the State supporting infrastructure and the auto industry delivering fuel cell vehicles has really jumped all over the map in the time that we've -- you know, I mean you can go back to 2000, but even in the life of this program. And I just want to highlight or mention a few data points.

Back in 2012 and 2013 CEC and ARB, actually using the auto industry and fuel cell partnership numbers projected 53,000 fuel cell vehicles in 2017 or by 2017 technically, so 2012 and 2013 that's the number. And that's the number we were working with when we were negotiating AB 8 -- 53,000 fuel cell vehicles by 2017.

That was adjusted in 2014. And you can look at this in the Investment Plans to 20,000 fuel cell vehicles by the end of 2017, so there's a significant scale back.

And then it was adjusted again earlier this year to 6,600 fuel cell vehicles in 2017.

And then this new plan, that draft plan from the staff, is now talking about 10,500 fuel cell vehicles by the end of 2018. So a year later, 10,500 fuel cell vehicles. Again, the numbers have jumped around. And I understand that there's a lot that the State has no control over. But we have to keep those vehicle numbers in mind as we're considering this level of investment in infrastructure.

And at some point if the vehicles don't come in the numbers that we all hoped, that we still hope they will, we have to take a look at this infrastructure commitment and say, "Does it make sense," because at some point it really does become ridiculous. If you look at the number of vehicles and the amount spent on infrastructure, the amount per vehicle is a huge number.

And I'm not saying we're there yet. I'm flagging this, because I know it's a sensitive subject. But I'm saying this conversation in this next year is very important to see what happens from the auto industry side in their development, deployment of fuel cell vehicles.

Because I think it's going to hard conversation whenever we have it, but a year from now we need to have that conversation in earnest. Thank you.

COMMISSIONER SCOTT: I think that maybe, Jim or Randy you can maybe correct me if I'm wrong, what you laid out is actually a lot of what is in -- or Erik or Peter -- in Assembly Bill 8, right? So it asks us to put up to $20 million dollars a year into hydrogen-fueling infrastructure until we get to that initial backbone of 100 stations.

But it also asks us to do both: The AB 8 Report led by your Resources Board, which comes out in the summer and talks a lot about the vehicles. And then the AB 8 Report led by the Energy Commission that comes out at the end of the year that talks about the infrastructure.

And that's the assessment that AB 8 has asked us to make, exactly what you're talking about, right? How many cars are there? What does the infrastructure look like? Do we see the costs of the infrastructure coming down? And when you put all that together and give them where we're trying to go, does this investment continue to make sense?

And so we are working on that. And I think that that's my understanding of how AB 8 has laid out what we're supposed to do on hydrogen, as well. So I appreciate you raising that.

MR. MCKINNEY: No, Commissioner. I think you've covered that.

So I think it was Brian and then Bonnie.

MR. GOLDSTEIN: Hi, it's Brian Goldstein from Energy Independence Now. I'd like to applaud the Commission's commitment to building out the necessary infrastructure to at least give the technology a chance.

I think this is an absolute watershed moment for the technology we're seeing. Many station openings just looming in the coming weeks and months, the vehicles are hitting the road. And I think we're on the right path. I applaud the Commission's commitment to the next round of stations.

One thing I wanted to bring up about the next grant opportunity for stations is there wasn't really a carve-out for renewable hydrogen, per se, within the stations. And I understand that that's been built into the scoring criteria to give stations that have access to 100 percent renewable hydrogen -- to be specific -- an opportunity to get higher scoring or priority funding there.

And I understand the reasons behind that, but I would like to suggest that we take a look at what it will take to get us to that point of 100 percent renewable hydrogen. And whether that's through increased funding to

the individual stations that want to put the manufacturing equipment onsite or whether that's through other mechanisms. You know, it doesn't necessarily have to come through the infrastructure program.

So I'm not necessarily advocating that we allocate money at this point to the actual equipment to manufacture renewable hydrogen, but simply to the research of what it will take to get to the point where it makes sense for the market to do that on its own. And whether or not there are steps that the State can take to kind of incentivize that at this point.

So I'd also like to applaud the community prep grants that came out I guess at the end of 2014, across the board, for the various fuel types. I think this an incredibly important issue for the Commission to take on. And I think that hydrogen specifically stands to benefit from this. And I think it in general it really will help the State see their funding used most efficiently and quickly by making sure that the communities that these stations are going into are prepared ahead of time.

And we've seen a lot of delays. There have just been growing pains along the way for everything from permitting to siting and so forth. And I think that with a relatively small amount of funding that's being spent on the community preparedness grants we can really minimize

the time that it takes to develop and open up these stations. And really try to see a return on this investment quickly. So I applaud that effort and I certainly hope that that's part of the next round of community prep grants.

And lastly, I'd like to say the whole point of the program with the State funding hydrogen infrastructure is really trying to get the market to the point to where it can be funded on its own, where it makes economic sense.

So I think we're reaching a good point, around the halfway point of the scheduled number of stations that are being funded, to take a look again and say, "Okay. These are the lessons learned. These are kind of the market lessons learned. And what is it going to take from this halfway point to make sure that the market can take over and finance that 101st station? Are there additional funding mechanisms? Are we on track to make sure that once the State finishes with the 100 the market can take over and finance the rest."

So again, those three points: community prep, renewable hydrogen and then financing the 101st station; I think that's being addressed effectively. I applaud the Commission's efforts to do so and thanks for the opportunity to speak.

MR. MCKINNEY: Great. Thank you, Brian.

Bonnie Holmes-Gen?

MS. HOLMES-GEN: Thank you. I wanted to support this allocation also and state that just as I mentioned with electric vehicles, we're really excited about the rollout of hydrogen vehicles -- a lot of exciting news lately and coming up.

And so I think it's important to be reminded again that this slate of zero emission vehicles, including the electric and hydrogen vehicles, are critical to our air-quality attainment plans and I appreciate that being mentioned in the document here.

And we have about 15 years, but we have a new Ozone Standard we have in the 2030s and we have to show that we're going to be able to meet this new federal Ozone Standard in the South Coast and in the San Joaquin Valley. And it's a huge challenge. And this transformation that we're starting to see now is critical to getting those emission reductions and getting the health benefits that we absolutely need to see.

And I wanted to also just comment about, for both hydrogen and electric charging infrastructure, the issue of signage was raised in the document. And I just wanted to mention that, because it is really important. I think we've talked in the past about some of the research that has demonstrated that people, a lot of people

unfortunately, are not aware of this huge transformation that is happening.

For those of us it's hard for us to believe that if we are driving a LEAF or another zero-emission vehicle. And we're aware of all the benefits, but a lot of people are not aware and not seeing this happening and so the signage, having it obvious that these stations are out there. They're not just seeing gas stations, but they're seeing obvious signage and saying, "Hey, these charging stations and hydro stations, they're in places that I'd like to go. They're at the mall, at schools and shopping centers and places that I frequent."

So I just wanted to highlight that. It's really important. It's flagged in here, but I would love to have you develop that section as you go forward.

MR. MCKINNEY: Great. Thank you, Bonnie, for that reminder.

Any more Committee comments here in the room? I think -- and Brian, if you could put your name card down please? Thanks.

And I think we have John Shears on the phone for Committee comments?

MR. SHEARS: Yeah. So I want to speak in support of continuing, which with what at this point is really formulaic, annual funding for the hydrogen fueling

infrastructure and the related O&M costs. And while respecting Tim Carmichael's observations, would like to note that part of the reason for the disconnect between the numbers that the Fuel Cell Partnership expounded upon is part of the roadmaps and updates -- those were numbers that counted on the infrastructure sort of being there in place.

Energy Commission has put in mighty effort to get the funded stations up and running, along with the Governor's Office and staff over at CARB and CDFA. And part of it was this junction that happens between head offices at the car companies in terms of when their bosses sign off on the major fuel cell strategies within each of those companies. And when those show up in market relative to when California finally sent that market signal to the world that California was committed to supporting hydrogen fueling and fuel cell vehicles.

So there is a disjunction and the ramp is behind where everyone was hoping it could be vis-a-vis 2017 as outlined in the original roadmap that Tim referred to.

But both Toyota and Honda, for example, are demonstrating their commitment to this by pouring a fair amount of their own money into the fueling infrastructure, not only into deploying the vehicles for the market. And the cars will be coming as long as we keep deploying the infrastructure. We being California

That being said we still need to make sure that we're making the decisions based on good metrics, which takes us back to the evaluations that NREL will be conducting on behalf of the California agencies and the Legislature.

With respect to the cost of stations I'd just like to point out, as I pointed out in several of the past years, if you look at the sums of investments that go into supporting EV charging infrastructure, EV fueling infrastructure, and the number of cars that are served relative to the cost of a retail fueling station that works along the traditional liquid fuels models and the number of cars that those stations serve the numbers are not out of alignment with each other.

Psychologically, okay people can look and say, "Oh wow, a $1.5-2 million hydrogen station. That's terrible." But similar levels of investment need to be put in place for the charging infrastructure to support a mature EV fleet. So I just want people to be aware that when you're working towards getting these new technologies from a nascent to a mature market you are looking at similar levels of investment and fueling infrastructure.

And I don't have the data in front of me, but I know there has been work that has been done on this in the past; academic work that basically shows that you're

looking at similar levels of investment.

So with that I'll end my comments there. Thanks.

MR. MCKINNEY: Great. Thank you, John.

And I do believe, and correct me if I'm wrong Erik, that under the current ARB survey to OEMs that there are assumptions built in about how many fueling stations will be out there during the survey period, so the three-year-look-ahead survey periods.

MR. WHITE: Yeah, there are.

MR. MCKINNEY: Okay, any more comments from Committee members present or on the phone?

Seeing none I'd like to turn -- I don't have any blue cards from public members in the room. Seeing none I'd like to open the phone to John Reed for a three-minute comment.

MR. REED: Yes. Having driven the Mirai I would just like to say that it's very nice to see that we have OEM participation to bring real change and real technology. My concern though also mirrors Tim Carmichael's that we're putting a lot of money now into early technology. I'm concerned that when we come around to next year some technology will be improved on, especially the station technology.

There's lessons to be learned, just like there was with C&G. We can say, "Oh, that's fine. We'll get

more money from the next Legislature. And there will be more money available to us from the Cap and Trade or whatever, but we don't really know that. And I would suggest that the CEC consider holding back a little bit on some of this funding to make sure that there's funding available later for improvements that will necessarily mean -- be met and meet.

And again, back to training. Looking at the fire departments in the areas where these things are going to be, these folks are terrified. Their only reference is the Hindenburg. So having driven one around, and it's a perfectly safe car and it's a really nice piece of technology, we've got to get that message out to these folks. But we've got to have folks trained out there that can actually deal with if there's an issue or a problem, because there will be at some point. Any time you're dealing with high-pressure gas, any time you're dealing with something that's flammable as hydrogen, much more flammable than CNG there's going to be an issue.

So we've got to be prepared for that and I just haven't seen a whole lot of that in any plans. Thank you.

MR. MCKINNEY: Thank you. I do need to correct one of the statements there. No member of the State Fire Marshall's Office or local Fire Marshall's Office uses that analogy. That is a grossly outdated analogy when we're

talking about the flame point or flammability of hydrogen. Thank you.

Okay, good discussion. Why don't we turn to Natural Gas Fueling Infrastructure? Are there any comments from Committee members here in the room? And just a friendly reminder, this is primarily targeted now for municipalities and school districts.

Tim Carmichael and then Claire.

MR. CARMICHAEL: Thank you. I support the allocation.

I will provide some written comments on some of the statements in the write-up on this section. But the one I want to flag right now, because it gives me an opportunity to do some education, is a statement that says, "This result" -- you're talking about the high benefits found from the investments in the natural gas infrastructure -- "This result is due primarily to the high amount of fuel dispensed as well as the small number of stations that are dispensing renewable natural gas."

And I want to just clarify that based on the LCFS on tracking results it may be true that there's a small number of stations that are doing 100 percent renewable, natural gas, but there's a significant percentage of natural gas stations across the State that are dispensing a significant percentage of renewable natural gas today.

And so that statement taken out of context is a little misleading based on the data we have this year. That's it. Otherwise, I will provide additional thoughts in writing on that.

MR. MCKINNEY: Great. Thank you, Tim.

Claire?

MS. JAHNS: Claire Jahns with the Natural Resources Agency. And this might be a question as well as a comment just because I'm new. I'm new to this, so feel free to add information or correct as needed.

But there seems to be, I mean, in the earlier discussion on biofuel production there is a clear potential local benefit both in terms of sourcing feedstock, which then has spillover benefits for life cycle, greenhouse gas and other emissions associated with production and then transportation in use of the fuel.

So I'm wondering if there might be kind of synergies between investments in infrastructure and production here I'm focusing on renewable, natural gas. And that might go for hydrogen to some degree as well and if the focus on infrastructure at municipalities and schools, might fail to capture some of that synergy if the production is going to be largely to focus on private sector or both.

MR. MCKINNEY: It's a very good question. I'm

not expert on this, so I don't know if we have other staff in the room that would want to comment to this.

I think from what I've observed at anaerobic digestion plants there's less of a workforce needed there than for say a full-scale biofuels plant where they're bringing feed stocks and have a fairly long and complex technology process and then the offloading. So I think it's simpler, because more of its automated, more of it's injected into from one vessel to another.

But I think it's something that we can look into some more and see if those synergies are maybe out there.

MS. JAHNS: And on a kind of a related note if there are some regional synergies? I mean, it's often been a topic of discussion in having a methaned super highway in the Central Valley associated with the Dairy Digesters. I'm sorry, but just wonder if there are any past Regional Readiness Grants that are kind of looking for implementation at this point or if in this whole citation for the Regional Readiness Grants, assuming that those might be soliciting renewable, natural-gas production as well as EV and other infrastructure and production if going forward the intent can be created to solicit Regional Readiness Grants that would then be implemented in later years?

MR. MCKINNEY: That's a creative suggestion.

Let's see, is -- Tim, did you want to add to this discussion?

MR. CARMICHAEL: No. You guys have got it.

MR. MCKINNEY: Okay.

Bonnie.

MS. HOLMES-GEN: Yes. Bonnie Holmes-Gen. And I wanted to comment. Not sure if it fits best in this or the vehicle discussion, but these two criteria that were mentioned in the slides at the beginning of the presentation regarding setting some criteria for natural gas that is renewable and natural-gas vehicles that meet the low-NOx standards? I think those are two really important criteria to make sure that we're moving forward with the projects that are the most sustainable, cleanest projects. And move us toward meeting our long-term air quality and greenhouse gas goals, so just wanted to support those criteria. And wondered if it's mentioned in the slides?

Is that something that are those criteria something you're considering adding to the solicitations? Or where is that in the process of CEC right now, where are those considerations?

MR. MCKINNEY: So it is something that we're tracking very closely and evaluating. It's a conversation we have with the Air Board. And they already have money

earmarked specifically for that combination of low-NOx, natural-gas truck engines coupled with bio-gas fueling.

And I think a question for us is how quickly can this low-NOx engine come into California markets and then be followed up with the larger engine that's needed as well.

And we actually are going to have a speaker on that coming up pretty quickly. Any other comments at the table on this one?

Yes, Steve Kaffka?

MR. KAFFKA: Our group just did an analysis of the costs of generating methane and methane emission reductions in dairies. And there have been other studies in the State as well. And I think the thing they keep in mind is, as your increment this up, most of the dairies for example are in the San Joaquin Valley. They're not uniformly distributed along Highway 5.

The same is true for food processing facilities, wastewater treatment facilities, which have anaerobic digestive capacities. Again they're not uniformly distributed around. And the same is also true for the facilities that are going to be handling municipal solid waste. So there's some distance between where this stuff is and where it will be collected and made available. And the idea of kind of a statewide web of -- unless you can

put it in pipelines and there's a lot of obstacles to that right at the moment.

So anyway I just wanted to raise that, that there's is some distance between cup and lip in this area, though it needs to be, should probably be addressed in terms of practical steps from Point A to Point B.

MR. MCKINNEY: Let's see, can we turn to committee comments on the phone? Do we have anybody, Andrew? One, okay is this a Committee member?

MR. MUI: Yes.

MR. MCKINNEY: So go ahead, please.

MR. MUI: Hi. This is Simon Mui, can you hear me?

MR. MCKINNEY: Yes, very well Simon.

Yes, go ahead Simon.

MR. MUI: With NRDC, okay.

Yes, I would just like to follow up too, on the biomethane question. In terms of a Low Carbon Fuel Standard we know that there is, because of the low CIs (phonetic) there is quite a bit more biomethane coming into the system, so to speak and a large potential there.

I'd also support CEC as it moves forward around the infrastructure to tie in the biomethane into -- as it thinks about the incentives for natural-gas fueling and --

(Audio goes dead.)

MR. MCKINNEY: Simon, you're fading out there. Can you try that last sentence again about linking I think biogas with something else.

(No audible response.)

I don't know if the battery was fading there or?

COMMISSIONER SCOTT: I know.

(Colloquy off mic regarding audio difficulties.)

MR. CARMICHAEL: My members had nothing to do with that.

MR. MCKINNEY: Okay, we will be sure to make time for Simon again to complete that thought.

With that, and I don't have any blue cards for speakers in the room or -- wait, let me wait for Andrew and Jacob here.

Okay, I think Peter Ward did you want to speak?

MR. WARD: Good afternoon Commissioner, Advisory Committee members. It's good to be back here with a program I'm fairly familiar with.

Today I'm speaking on behalf of Mike Lewis, who is the President of Pearson Fuels who has established many, many E85 stations, natural-gas fueling stations and hydrogen stations in partnership with the California Energy Commission. Mike regrets he can't be here today. He had a previously scheduled travel. Mike asked me to relay his comments for him and his observation. And his observation

is since 2012 the E85 infrastructure issue has been discontinued, so to speak.

In the Investment Plan, in going forward it has stranded investments that have already been made in the E85 infrastructure. It's very difficult to continue to build those E85 structure stations when there are market signals that are decidedly negative. And I think it's important for the Commission and this program to understand that "no comment" can be determined as a negative market signal

I think it's important to note that E85 and ethanol have -- basically in the Scoping Plan for AB 32 was one of the major scenarios. It was cellulosic ethanol and FFVs was a lion's share of the fuel that was to be used.

There are over a million flexible fueled vehicle drivers in California. But do you note that in the Investment Plan that only about 1 percent of those vehicles ever see ethanol. I think that presents a problem, but it's also an opportunity. If there are a million vehicles out there I think it's important to provide the fuel for them.

I think we've been a couple of years away from the controversy that ethanol caused a few years ago. I think now it's time to look at it in a more straightforward and businesslike manner. E85, when California sources made it the lowest carbon ethanol in the State and in the world,

really, that can result in a market-based solution to reduce petroleum if we're still serious about petroleum. I started at the Energy Commission in 1977 based on the fact that we needed to reduce petroleum.

I feel like an utter failure. (Laughter.) I'm just kidding about that.

It can become a commercial alternative that can improve and transform towards the long-sought goals of the California biofuel production. In other words, we had goals set we would produce so much of the biofuels we would use in this State.

It can assist the achievement of many of California's public policy goals contained in the Bioenergy Action Plan, the AB 32 Scoping Plan as I mentioned, and the CEC's Alternative Fuels Plan. E85 was a prominent fixture and an important fixture for that.

I know my time is blinking.

The Alternative and Renewable Fuel Vehicle Technology Program is the only entity that can fund this type of necessary infrastructure. The goals or projects are to reduce use and dependence on petroleum transportation fuels. And increase the use of alternative and renewable fuels in advanced vehicle technologies. It also supports the production of those fuels in the State and expands the alternative fuel infrastructure and fueling

stations available to the public.

For 85 there is no vehicle subsidy necessary, there's no fuel price support necessary, there's no operation and maintenance station subsidy necessary. It's just a relatively low-cost infrastructure incentive, which are quite cost-beneficial of vehicle, of infrastructure, of fuel costs and consumer choice basis -- and serves the one million FFV drivers.

I think that this fuel, it would be great to have enough infrastructure to be able to provide vehicle choice and fuel choice to all of the citizens of California. Those in the disadvantaged communities these are vehicles they can afford and in areas where ethanol is produced. Lowest cost and for the highest gain, that is true capital efficiency. And this program I think with a moderate investment can achieve a great gain in that regard.

Mike is requesting that the apparent drift away from support for E85 infrastructure be addressed publicly, soon; perhaps even in this Investment Plan or in a topical workshop.

In addition, request that funding be reinstated for the continuation of the good works fulfilling the state's goals and avoid the negative market signal that is sent when issues are not adequately addressed.

I'm almost done. This just in Mike also wanted

me to let you know that Pearson's 29th and 30th stations have been established and completed. And a station in Yorba Linda opened last week and one at Bell Gardens is opening this week. He's continuing his work. With your help from the Energy Commission he'd like to continue his effort. Thank you.

MR. MCKINNEY: Great. Thank you, Peter.

Okay, we would like to close out this discussion and move on to Natural Gas Vehicles. And to kick this off we have Stephen Ptucha from Cummins Westport. And is he cued up?

MR. PTUCHA: Should be if I can get the ball over here and then I can start my screen.

MR. MCKINNEY: Okay, give us a second here Stephen.

MR. PTUCHA: Sure. And let me know if you see my screen across there too.

MR. MCKINNEY: Okay. You're coming up onscreen.

MR. PTUCHA: Perfect. Okay. Well, thank you very much for allowing me to speak at today's workshop session here. I want to give a little rundown on Cummins Westport's lower-emissions technology and our newest products coming out with it.

As everyone is aware is the air quality is making California take some steps for improvement. And some of

these are both technology development and demonstration funding as well as end-user incentives. And that's what's kind of driving it from our side.

What we've seen in the standards and specifically with NOx there's been almost a 97 percent reduction since 1990 to the current standards. And then ARB has set out three optional low-NOx standards. And we've seen the steps that they're pushing to make this more than just an optional.

And so from the current standard of .2 the first optional standard is 50 percent below that at .1. And then the next standard is again another 50 percent lower at.05. And then the third standard, which is being referred to as "near zero," this is kind of the on-par with the total emissions in that area for electric vehicles is .02, so that's a 90 percent reduction from the current mandated EPA standards in NOx.

Now back at the start of 2014 CWI started a technology development project. And this was funded from AQMD and California Energy Commission and SoCal Gas. And a big thanks for this funding. And you'll see in most of our products they have had some engagement, some funding from the various agencies, and helped us get to market with a lot of these. So we're very appreciative of that funding.

And we've heard earlier today of the ongoing

funding and I'm quite happy to see that, because I think it is making a difference especially with the products that are available out there.

So this project, our goal was to hit .02, that lowest standard, the optional low-NOx standard. And for the first year in 2014, we really focused on R&D work and understanding what it would take with a natural-gas engine to hit this low-NOx level.

In this past year, and we're kind of coming to the end of 2015, we've taken what we learned in 2014 and looked at the design and did some commercialization design, high-volume manufacture design. And we've also launched field trials and demonstration work to really ensure that we understand that this product will deliver the kind of performance and reliability that's expected out in actual use.

So again the first year we spent really understanding the technology. What was it going to take to get to the .02? This hadn't been done before by any internal combustion engine. And so we looked at all the different areas on the engine. Looked at variable geometry turbos and the air handling, looked at port fuel injection in the fuel system. We did a very extensive review and a lot of testing and simulation to really get a feel for how much of an impact that these various changes would have and

what's their downside?

And from that we then had a good understanding, so we could then make an evaluation of what our architecture would be on the engine.

And it's easy to say that you'd throw in every piece of technology to continue to bring the emissions down, but that comes at a cost. And so we tried to balance out both the emission's performance to hit the goal as well as maintaining the fuel efficiency, if not improving it. Watching what the cost will be of this end engine, because that gets passed on to the end-users, and we are sensitive. This isn't a pleasure vehicle for people. This is how they run their business. So we're very sensitive to that side.

And then the last two were some key ways to look at this. Both the development time to then commercialize this technology and also the impact on the vehicle OEM and also the impact on the fleets is we want to limit the changes on this engine, so that it can be put into vehicles quickly and put to market quickly. And then it fits in with all of the investments that have been made to date.

So with that we then came up with what we have called the ISL G Near Zero Engine product. And that what we ended up selecting from all of that testing and development work that we did, we continued to use the 8.9 liter ISL G base engine, which uses stoichiometric cooled-exhaust gas

recirculation spark-ignited combustion. So it's just the chemically right mixture of air and fuel, so there should be no leftover air or fuel.

We've added to that a closed-crankcase ventilation system. So that takes a lot of the blow-by that goes past the combustion chamber down into the crankcase. That gets filtered and then reintroduced back into the air intake. It then goes through the combustion process again, so that will reduce the methane emissions and also has an effect on NOx as well. We also did a lot of design to the three-way catalyst. And using a larger catalyst provided the extra NOx reductions that we needed to bring that level down.

And then one of the key pieces that isn't as visible on when looking at an engine is all of the improved control and calibration software.

In the early days of engine improvements you put on a new component and it reduces emissions in all uses, throughout the whole PV cycle. We're at a point where we're trying so fine with the improvements that we really have to concentrate on the portions of the duty cycle, the operation where high-NOx is formed. And some of that is when you're on and off the throttle.

So when you're on the throttle fuel is going through, you heat up your catalyst, it's working very

efficiently. When you let off the throttle there still is air going through the engine, but that can change the temperature in the catalyst and that can change its performance. So a lot of the software and controls that we looked at really optimized those operating conditions and focused on those, I'll say high-NOx operating conditions, and to reduce those.

So combined in with some of the mechanical components we added or improved, then put this package together and this is where we got the low-NOx.

Now, about a month ago we received our certification from ARB and EPA for this engine, so here's a copy of those. And it's hard to read, so I'll blow up the ARB. And this is the air criteria pollutants listed. And if I go and highlight on the NOx, again, the standard for the current, optional, near-zero low-NOx is .02. Our engine here was certified to .01, so we hit that mark with a lot of extra room in there. We tried to get this as low as possible.

And then the Co2 again we are lower than the standard, we meet the 2017 requirements as well as we'll be set up nicely for the Phase 2, which haven't come into effect yet.

And the reason that this is so important it shows that the internal combustion engine, one hasn't reached its

limit for how low on emissions we can go. And also that it is here now, it's not something that needs to be worked on for ten years and in the future we could have a low-emissions engine. This is certified, this is I'll say the engine is getting close to being ready to go.

And to kind of put it in perspective here if we look at emissions and we take a 1985 bus, for instance, and if it met the standard for NOx way back then at 10.8 grams per brake horsepower per hour and we'd say, "What's that equivalent to the current 2010 standards at .2 NOx?" That's about equivalent to 54 buses.

Now if we look to this optional low-NOx standard that is .02, that original bus that just met the standard back in '85 that would be equivalent to about 540 buses there.

Now this engine, our ISL G Near Zero we've certified to .01 and so if you look at the equivalent number of buses for that emissions that's over 1,000 -- 10 to 1,080 buses.

So visually this kind of gives you a picture of how significant of the reductions we've been able to achieve. And it has been because of CEC and others helping us fund the development of this technology. And the ARB for pushing some of these standards in there and saying, "Hey, we think we can do it."

So this engine is scheduled to go into production in the second quarter of next year. Based again on our 8.9 liters, so that will be the size. It carries over the peak rating of our current ISL G, and so it tops out at 320 horsepower, a 1,000-foot pounds of torque.

And it will be certified as I showed you there. We have all of the certification. And it maintains that three-way catalyst, the passive kind-of-forget-about-it is packaged in as a muffler. You don't need to do anything about that three-way catalyst, so it's a nice feature that the fleets have enjoyed. And this is compatible with CNG or LNG.

Here's the full ratings that it will have and that's again the same as what our current product is. And we've tried to maintain this, so it's as little impact on the end-users and the OEM vehicles as possible. So they can easily change to this engine and have it available to fleets. It will still be targeting the same markets as the ISL G does right now; just transit, refuse and medium-duty trucking.

And just to point out that our medium-duty trucks with this engine is limited to 66,000 pounds gross vehicle weight. If applications need 80,000 pounds or more then probably our bigger engine, the ISX12 G is better suited there. I know there's also applications for shuttle and

school bus and vocational.

So this is the first of our engines that we're taking to near-zero. This will be available in new vehicles through our OEM partners. It will also be available for vehicles that are having engines replaced for repower, which is common for transit buses halfway through the vehicle life. It will not be available through retrofit where calibrations and parts are added to an existing engine. Again, it will be new vehicles and repowers there.

The technology that we've developed is portable to our other engine platforms, the larger ISX12 G and also to the smaller ISB 6.7 G, which will be released in the April timeframe of next year as well.

So we can take that technology and apply it to those engines. That's still a fair bit of development work and we are pursuing avenues to do that. And again working with agencies to see how we can quickly accomplish that.

But this is a start one and then again this will be available in the second quarter of this coming year.

I open it up to any questions there.

MR. MCKINNEY: Hi, Steve. This is Jim McKinney with the Energy Commission. Thank you very, very much for taking the time to put together the presentation. I think I can speak for our staff that we are very, very excited to

have this become available more quickly than we'd anticipated, by a year or two.

I know one question that Tim Olsen asked me to ask is how quickly can you ramp up, and are you willing to share any production or sales projections with us at this time?

MR. PTUCHA: Yes, this engine will be made where the existing ISL G is made at Rocky Mountain, North Carolina, the engine plant there. And that's where the diesel version is made as well. And so that plant is set to handle our current ISL G volumes. And we expect that this one will, certainly by the excitement we've seen, will add to that volume. I don't see any issue with that plant being able to handle the ramp-up.

As I said this isn't going to be available to OEMs till second quarter. And that time difference or the a reason for that, that time there is we still have the finishing touches to do on a commercial product. So it's a lot of that is to get that final process worked out at the plant. And that's what we're working through now. They shouldn't have any issue ramping up there.

Now, volume-wise we are looking at the market and we see certainly a lot of interest from California. We then see interest from other non-attainment areas in around the country.

Now, with the actual volumes I don't have actual numbers that I can share with you. That's been one topic that even we've looked at and have, I'll say, different views on the estimates there. We see lots of excitement. A lot of people though didn't believe it was possible and thought it was years away.

So I think it surprised us a little bit that we could do it so quickly. We have really pushed though to do this. So we expect to hear in the coming months, since we just got the cert and we just kind of officially announced that the launch is second quarter. We expect to hear that feedback of customers wanting orders and all of that soon, so we'll be able to tell when we ramp up what the expectations are there.

MR. MCKINNEY: Great. Again, thanks very much.

Commissioner, do you have any questions for Mr. Ptucha?

COMMISSIONER SCOTT: No, just thank you for the good presentation.

MR. PTUCHA: Well, thanks again.

And again, thanks for all the help that we've had with the funding of technology and vehicle demonstrations. We certainly see that it makes a difference in helping us bring the products to market there.

MR. MCKINNEY: And Steve, if you can hold the

line I think one of our committee members, Steve Kaffka, would like to ask you a question.

MR. PTUCHA: Sure.

MR. KAFFKA: Yeah. Hi, very interesting presentation and congratulations on your progress. I was just curious is there a range limit; is there any tradeoffs with range when you're using a CNG fuel?

MR. PUTCHA: No. So one of the goals of the development project was to maintain or improve the fuel economy. So and what is coming out is it will have about the same fuel economy as the existing ISL G. So whatever the range of the vehicle, which is dictated by the size of the tanks, the CNG or LNG tanks on there, this engine with that same-size tanks will get the same range.

There shouldn't be any detriment to the current product.

MR. KAFFKA: Thank you.

MR. MCKINNEY: And Sekita, do you have a question for Steve?

MS. GRANT: Yeah, I had two quick -- thank you for the presentation -- two quick questions.

This one might be obvious, but is it possible to use RNG with this technology? Yes, Tim is nodding yes. He knows.

MR. PTUCHA: Absolutely.

MS. GRANT: Yeah, okay. The second question is if you can give us a sense of the demand that you're hearing for this technology, particularly just out of curiosity, outside of California and the other markets throughout the world or throughout the country?

MR. PTUCHA: Yeah. And so just to touch on the RNG, and I should have mentioned that, is the existing GHG benefit that we have we've shown one, that's just the engine. You throw it into the life-cycle cost of the vehicle and the fuel upstream and certainly when you throw in RNG that upstream emissions is looking far more favorable compared to the other fuels around there.

Assuming that the fuel is meeting the fuel spec that's in place right now there's no change in fuel spec for this engine as current product. Then it should be capable of however much of a blend of RNG is in the fuel there, so that should be fine.

Interest from outside, again it's a little muted in the sense of early on before we announced the product -- and we've only announced it in the last month or so -- the discussions are a lot of fleets and air-quality agencies are interested in this. But they're saying, "Hey, that's years away, so we are interested. Eventually it'll be there."

Since it's come out, it's only been a short

amount of time. We're already getting fleets inquiring about the differences. We're trying to communicate those differences quickly. We're hearing a lot of transit fleets interested. And some of the things that they are saying is, "Can we switch over orders that may be already placed?" As well as looking at some of their repowers that they do halfway through the vehicle life they are looking at this is an option in the repower to then reduce their existing fleet, so not purchasing new vehicles, but their existing vehicles to take it down to this low-emissions level.

Again, though then their flipside is, "What's the cost going to be and what are the incentives out there?" And as the incentive packages are being finalized and being made available then I think you put it all together and then we'll see the real demand there.

It still is a little early and I don't have numbers to kind of share of actual demand there.

MS. GRANT: Thank you, very helpful.

MR. MCKINNEY: And then Chris Shimoda, did you have a question?

MR. SHIMODA: I'll wait until the last (indiscernible)

MR. MCKINNEY: Great, okay.

Okay, I want to kind of close out the questions to Mr. Ptucha from Cummins Westport.

Again thank you very much Steve, a great presentation, and congratulations on accelerating a development timeline for that product. And we are waiting anxiously here in California.

MR. PTUCHA: Well, thank you. Thank you very much.

MR. MCKINNEY: Okay. Yeah, Chris do you want to lead off the discussion for Natural Gas Vehicle Funding?

MR. SHIMODA: Sure. And thanks, Steve, for that really good presentation on the .02 engine.

And I just wanted to say, number one, just on this particular item to note the success of the transition to the UCI voucher model. My understanding is that program was oversubscribed within -- I know the estimates vary, but very quickly.

And to also note that to Stephen's point about trying to figure out what the demand for these engines are, it's the reality as far as I can tell, especially with the private fleets that the demand is still largely being driven by incentives. And so the importance of continuing these programs cannot be overstated.

On the subject of low-NOx within this particular program I think we do need to take a very measured approach to figure out when the trucks, buses or refuse vehicles, whatever we're funding, when those vehicles are going to be

available. Because there is a live time between when the engine is certified, when it's produced, it's going to be debugged and then finally put out into the market.

And I would definitely not support cutting off incentives for the none low-NOx engines at this time, because there is still a need to grow the overall market share in general.

And then finally just on the renewable requirement, I know this was touched on before a little bit in the previous section. I just did want to note that this would be a major policy shift to start requiring very specific types of fuels to go into specific incentivized vehicles. I don't think that we've ever really done this before in any other programs I'm aware of for vehicle incentives.

And this is still a subject of debate amongst both state agencies and the legislature. So I would just urge caution that we probably shouldn't get ahead of the debate that's going on right now about how renewable fuels are kind of injected into this system.

I just kind of say what I said during when we debated this in the Legislature that the point of regulation for fuels getting into the system has always traditionally been upstream. It's starts getting very burdensome when a fleet owner to get an incentive you

actually have to track every gallon of fuel that's going in at every single point to make sure it has a specific, renewable content.

So we'd urge that that responsibility for getting the renewable fuels into the system upstream with the fuel suppliers.

MR. MCKINNEY: Tim Carmichael.

MR. CARMICHAEL: Thank you. First, let me say that -- let me start. I've got about a half hour of comments to make the same point that Steve made with that one slide on the buses, on how much cleaner the CWI engine is. And I don't think that slide quite did it, so I'm going to go ahead and do those comments. Not really.

But to me even if you took currently available engine technology and did the same slide it's a dramatic leap forward. And the more you talk to different agency people around the company, the more you talk to engineering folks, everyone is saying this is a tremendous step forward for clean air.

And appreciate the presentation, but also very much appreciate that whole team's effort, which included funding from this agency, to make it a reality. So I'm looking forward to that rollout and production next year.

I want to echo the comments that Chris just made. I think we are going to get to a point where it makes sense

to support incentives for only low-NOx engines. And to make sure we've got mechanisms in place to increase renewable natural gas in addition to the LCFS program. But I'm not sure we're quite there yet.

And actually we've had this conversation a couple times with ARB this year. And I consider it an ongoing conversation, because most of the industry that I represent are jumping for joy with this low-NOx engine availability. And most of them are very supportive of increased use of renewable natural gas. It's not resistance about the prospect there it's resistance about how to make the mechanics work without creating headaches.

And to Chris's point, just to put a number to it, believe it or not we're still only at 1 percent of the heavy-duty truck market. We're only at 1 percent with natural-gas trucks.

And there is this relatively large industry. We refer to them as the petroleum industry that wants to continue to sell diesel trucks and lot of them diesel fuel. So I hear all the time from my members we need to be cognizant of that. And let's not leap ahead so aggressively that we in any way hurt this budding alternative fuel that has tremendous potential.

I want to refer back to a comment -- it was in the presentation this morning -- staff talking about CNG

pricing. I was at a workshop at UC Davis a few weeks ago talking about natural gas and the prospect for petroleum prices to stay where they -- there are some global fuel experts there who laid out that their best guess is that we're going to see petroleum prices stay basically where they are for three to five years.

And I was not happy to hear that, because I was worried about what does that mean for the rollout of this low-NOx engine? What does it mean for the prospects for renewable natural gas, fossil-fuel natural gas?

And one of the points that was made a couple of times that I want to share with this group is, "You look at the average price that's out there reported on various websites or in the papers for diesel and the average price for CNG. And you think, Wow, there's not much of a differential there. How is a fleet going to justify that?" And it is a challenge, but it's important to note that many if not most of the refuse fleets and many if not most of the transit fleets are not paying that average price. They are paying significantly less than that and still seeing a fuel-price benefit that's meaningful between natural gas and diesel.

And I'm hearing that not only from some fleets, but I'm hearing it from the sellers of the trucks. So there's still a motivation in addition to clean air for

many of these fleets to embrace this new technology and the alternative fuel, in general.

I also wanted to speak briefly to the Natural Gas Vehicle Incentive Program, which rolled out pretty smoothly at the beginning of August. And I think UCI has done a good job responding quickly to various inputs that they've been getting for requests for additional information sharing. But even included posting on their website which I think really helps people understand how the program is working.

The initial solicitation was for $10 million or just over $10 million. There were roughly $17 million, $17.5 million in proposals received. I'd say about 10 percent of that there's some glitches with, but we're still looking at an oversubscription of let's say $6 million or close to $6 million.

One of the ideas floated is that program -- as the program was being transitioned and there was discussions about the rollout of this administrator -- was the value doing of a 90-day review. That would not only give an opportunity to get feedback on how well are things going with the UCI management with the voucher approach, but also be what I hoped to be the catalyst for a pretty rapid augmentation to cover that oversubscription, which today is about $6 million I think even if you take away the

problem applications or the incomplete applications.

And so we're at 90 days, the beginning November is 90 days from when it rolled out. I want to encourage the CEC. I've already sent an email to staff and to UCI about this, but I want to encourage the Commissioner and other managers here to push for this, because I think it will be valuable for the further implementation of the program. And I think it's appropriate to do that before you augment the funding that you've already allocated. And we want to do that augmentation as soon as possible.

I think that's it. Actually, I want to take this opportunity to mention one other item I should have mentioned at the beginning. I think Bonnie referred to the importance of coordinating this program's efforts with the sustainable freight efforts and the Scoping Plan efforts. I want to add to that list.

ARB recently released the draft of their Mobile Source Strategy. There's some new concepts and some new data in there. And I want to make sure that the CEC is looking at that document. And it's not finalized, it's a draft.

So if you conclude that it's more appropriate to incorporate that in the next round let's have that conversation. But I think some of it, the data and points made in that plan are not likely to change. And so it may

be totally appropriate to incorporate some of those points into this update. And so I wanted to encourage the staff to take a look at that. Thank you.

COMMISSIONER SCOTT: I think those are great points.

I have. I'm not sure if the rest of staff as you probably have, but we've been briefed on the Draft Mobile Source Plan and have been thinking about that as well. And we'll continue to work closely with the Air Resources Board I think as we go forward, with that in this Investment Plan, so I appreciate that suggestion.

MR. CARMICHAEL: I neglected to say that we strongly support the allocation recommended, but we're going to make a pitch for even more. And I'll wait to -- actually no, I'll make it right now. And we can come back to this if you want,

But I think as I made the point with the biofuel production, I think it's appropriate to augment this category as well. There's a tremendous ripple benefit to these vehicle incentives. I think the demand is there. I think we've now got good evidence of that.

And I'm anticipating Jim McKinney's question of, "So, if you were king for a day, where would you shift the money from?" And I would recommend and will in my written comments that we shift it from the next category. And I

can get into more details on that when we cover that, because I have a few comments on that. But I do think we should be looking at that or making that change.

MR. MCKINNEY: Great. Thanks very much, Tim.

Are there any other comments from Committee members here in the room? Any comments from Committee members on the phone, one?

MR. MUI: Hi, it's Simon Mui saying hi. It sounds like I got cut off on audio on my last comments.

I did want to talk a little bit and clarify I think some of the -- I'm hearing the concerns from some folks in the industry about biomethane requirements or low-NOx requirements.

One of the things we look at from an environmental standpoint is sort of in terms of the program benefit the justification for incentives is that it indeed provides some type of societal benefit in terms of reduced air pollution or reduced GHG emissions. And one of the things that obviously to the extent that the low-NOx technology is, and can provide those reductions, that is an important element in terms of is gearing for incentive funding.

Some of the older natural-gas technologies have been compared with diesel. You know, the criteria emission benefits have shrunk over time, I understand that there was

in-use benefits still from CNG. But really when talking about maximizing some of the GHG emissions and NOx-reduction benefits of the program, that you're incentivizing technologies that are really geared towards low-NOx. And integrating biomethane with it, are key to maximizing that.

And finally, I think in terms of the LCFS that it would be good if to clarify it for the recent data in terms of the amounts of biomethane that are being credited into the system already as sort of a baseline. I agree that you generally don't -- you have a system in place that's under the LCFS and that is already -- you know, it has the reporting and all of that built into the supply side, the upstream side.

You may be able to avoid this concern -- I think it was that Chris flagged -- that you'd have to have individual refueling stations reporting data. I think that can be avoided, but it would be good to clarify that. Thanks.

MR. MCKINNEY: Great. Thank you, Simon.

And I see Chris has his name card up. And did you want to speak again as well, Tim? Okay.

MR. SHIMODA: Yeah, and just to respond to Simon. I know a lot of the debate about biomethane use in specifically incentivized vehicles surrounded around the

accounting for the Greenhouse Gas Reduction Fund and having to show a benefit. And there are a lot of ways that you can shape programs to share that benefit without going this fuel route.

For instance, a retirement program that would require a 2010 model-year diesel truck to be retired for a Phase 2 compliant, this is the greenhouse-gas role in the federal level.

A low-NOx engine you could show a 40 percent greenhouse-gas reduction benefit just from the aerodynamics alone. And so I don't think that accounting issue for the GGRF is a huge hurdle for us to get over.

There is not the same sort of accounting issue with AB 118. I just wanted to point that out; that for the purpose of dispersing these funds that's not necessarily an issue for us right now.

And to Simon's point also, yeah I think there are upstream mechanisms that we would get to that would not hopefully result in a specific incentivized vehicle fleet owner to keep track of all the stuff, because it would be extremely difficult to get anybody to take this money if we start going that route.

So the debate should continue. And I think that either through this process or through future legislation we'll get something hashed out.

MR. MCKINNEY: Okay. Thank you, Chris.

Tim?

MR. CARMICHAEL: Two additional comments, please.

To Simon's question about what is a good LCFS number for renewable natural gas, the latest numbers -- and I've spent a bit of time on this, this year -- the latest numbers that I've seen are 34 percent of the natural gas used in transportation this year is renewable natural gas. But there's a gap of about 25 percent between the volumes of fuel that other tracking systems show is being used in natural gas transportation and what is being reported under the LCFS program.

So only 75 percent of the fuel that CEC and others believe is being used for natural-gas transportation in California is currently being reported under the LCFS Program. We're still trying to get a handle on why. It's not obvious and it's not a single reason, but round numbers, 34 percent of the natural gas that's being reported in the LCFS is renewable natural gas this year. And that number is growing. And with the value of credits going up under the LCFS Program I think that number is going to grow more.

One other data point I think you've heard before, Clean Energy reported earlier this year that virtually all of the natural gas that they were selling through their

southern California stations this year was renewable natural gas. And they're the largest station operator in Southern California.

The second point is Simon's point about the value of incentivizing the low-NOx engines and having some sort of renewable natural gas component or lower GHG fuel component. I think brings me back to if we had a few more metrics woven in to how we're evaluating what we fund and prioritize for funding, his points would play out in the numbers, if you will. And I want to encourage that again.

MR. MCKINNEY: Very good. Okay, thank you, Tim.

COMMISSIONER SCOTT: Hang on, Chris might -- do you have to leave?

MR. SHIMODA: (Indiscernible)

COMMISSIONER SCOTT: I might want to call on you first for medium and heavy-duty advance then, so that we get your thoughts before you go. So I just wanted to make sure we get that in.

MR. MCKINNEY: Yes, okay.

COMMISSIONER SCOTT: Yes. Peter, go ahead.

MR. COOPER: I'm Peter Cooper with the Employment Training Panel. I'm wondering if I can speak briefly. I have a meeting at Labor Agency in about 20 minutes. It's right next door, so it's not that far.

COMMISSIONER SCOTT: Yes, let's do that.

MR. COOPER: So if I can skip ahead, I'd really appreciate that.

COMMISSIONER SCOTT: Of course.

MR. COOPER: Great. So we appreciate the partnership that we've had with the Energy Commission. And especially working with David Nichols from your staff who has been very accommodating.

And one of things that I wanted to bring up, which new members may not know and many of you that have been here do, is that our program through ETP is a contract program. So there's really bang for your buck as far the funds that are administered by ETP. You know that they'll be used wisely. Employers don't get paid until training occurs and somebody is placed in the job, so it's "pay for performance." It's a great model.

The funds that we get from the AB 118 are great for us in the sense that we're able to reach the public sector, which we normally can't do with our core funding. And so this is really important as we reach out to fleets and municipalities and support the great work that's going on here in the workforce world.

Also, we are able to -- through this funding we have been able to reach a number of trainees. So if you look our numbers that have been reported we're up nearly at 14,000 trainees that have received support from the AB 118

fund.

That being said we continue to get strong support and strong, I should say, demand for funding from employers, from municipalities. And we see this demand continuing going forward. And for that reason we would ask that you would consider continuing to fund the ETP. As you may see in the Plan for '15-'16 there is no funding allocated for ETP. And we're almost tapped out of money. We have about 500,000 -- a little bit less than $500,000 left from the AB 118 dollars. But our demand is much higher than that. So I would request that the Energy Commission and advisers consider continuing to fund the ETP.

One of the concerns that I have, quite frankly, is the signal that we may send to employers, to the workforce world as well, if our funding all of a sudden has this hiccup, has a stop in funding availability. And we've had that issue before with our authority to spend money. We fixed that problem and now we'd like to see the funding continue in some manner.

So I just wanted to make those comments. We're happy to be here and look forward to working together with everybody to support what's going on.

COMMISSIONER SCOTT: Thank you so much, Peter. And we're happy to have you here and delighted to get to

work with you all in partnership. We really appreciate the good collaboration.

Let me just ask the members around the table if you have any burning questions for Peter before he heads out.

(No audible response.)

Okay, great. Thank you so much, Peter.

MR. COOPER: All right, thanks.

COMMISSIONER SCOTT: Now we'll shift back to Medium- and Heavy-Duty Advance Vehicle Technology Demonstration and Scale-Up.

MR. MCKINNEY: Yeah, so almost, Commissioner.

COMMISSIONER SCOTT: Okay.

MR. MCKINNEY: We did have one blue card from a public speaker who wanted to talk to Natural Gas Vehicles. Trent Smith? Oh, whoops. Okay. And we hopefully will get his comments in writing then.

Okay. We are now going to turn to the Medium- and Heavy-Duty Advance Vehicle Technology Demonstration and Scale-Up.

And I think Andre, you're going to kick us off with this?

MR. FREEMAN: Yeah, yeah.

MR. MCKINNEY: At the end? Okay. He's not usually so shy, but okay.

Okay. We'll start with Chris Shimoda.

MR. SHIMODA: And yeah, I apologize. Like Peter I scheduled a meeting for 4:00 o'clock on a Friday. I have no idea what I was thinking, but just a question on this.

Knowing the amount of resources that the ARB is pouring into the low-carbon transportation fund could you guys talk a little bit about how you see this particular program complementing or kind of fitting within what they're doing with their demonstration pilot program -- the kind of slate of projects that they're doing?

MR. MCKINNEY: Actually, I am going to ask Andre if he'd like to speak to that point.

MR. FREEMAN: Sorry, I must apologize. We were dealing with a technical issue, so I wasn't listening. Can you repeat your question?

MR. SHIMODA: So Andre, if you could talk a little bit about how this particular category in AB 118 both complements or works with the low-carbon transportation fund programs that are somewhat similar?

MR. FREEMAN: Okay. I'm going to have to be a little bit cryptic, because we are currently developing our next demo solicitation.

And one of the things that we do is work with Peter's group actually, who heads up a lot of the medium and heavy-duty demonstration projects pilot deployment

projects over there. And so one of things you'll see through our next solicitation is that we're really trying to find our area that isn't already covered by the other solicitations that are out there.

We have to kind of keep track of how much GGRF funding is going to those areas. We still do believe that there are areas that aren't being covered. As Commissioner Scott mentioned earlier we're working directly with the (indiscernible) to figure out where those gaps are, where we could best utilize our funding to get vehicle demonstration projects of all types out on the road.

So stay tuned for upcoming solicitation. We'd love to get a more detailed input for you when we have the actual detailed plan laid out there.

MR. SHIMODA: And I don't think that I'm making a specific recommendation on $23 million, but just an observation that I know ARB programs and CEC programs in the past have done kind of swaps of resources.

Given the limited amount of money in AB 118, the relatively sizable amount of money in GGRF, and then just kind of the "less strings attached" pot of money that you have here I'd like to just plant the seed that there may be an opportunity to swap out some resources from the Low-Carbon Transportation Fund, which I think you'd speak to Peter here, who's very intimately involved with that

program. But I think we all want to see more dollar move through the budget process get into that program, but just to throw that out there -- making no specific recommendation for that dollar amount to move, but just that that may be an option to free up resources, for instance -- for Tim's vehicle incentive, kind of stop-gap funding.

MR. MCKINNEY: Jim Carmichael?

MR. CARMICHAEL: I did not -- yeah, I did not ask Chris to say that, but thank you.

I feel like -- well, let me start with the positive. I strongly support a creation of this category. I feel strongly it's a very important category. I am quite skeptical of the proposed funding allocation. And I think some chunk of this should be distributed to a couple other categories -- namely, biofuel production and natural gas vehicle incentives.

Obviously, I'm being a little -- I'm focused on the things I'm working on right there, but I think there's strong arguments for augmenting both of those categories. And I don't think the plan as drafted makes the case compellingly enough for $23 million. Especially when you consider that ARB is putting a chunk of change into this effort already. I'm not in any way saying it's not an important category. I'm not saying CEC shouldn't provide

significant funding. I'm questioning the 23 million. Thank you.

MR. MCKINNEY: Okay. Bonnie?

MS. HOLMES-GEN: Thanks. I wanted to express our support for this category Sand for this allocation. I'm happy to see there's been a steady increase in the amount of money in this particular basket for the past three plans. And I think that's moving in really a positive direction.

I think for the past three years as I had recalled there had been a lot of great discussion about the importance of this category from everybody around the table including Tim. And so it's just interesting how the discussion shifted a little bit.

I think this is incredibly important to moving our zero emission agenda in California, which as we've talked about is the basis of not just our greenhouse gas goals and targets, but our criteria pollutant efforts. It's incredibly important to assisting disadvantaged communities. And there's so much more that needs to be done around cleaning up freight corridors and bringing zero emission technologies around freight corridors.

And this is, you know, we always want to see more money in all these categories, but this is a significant -- this is a very significant effort that we have to deploy

these, to demonstrate and deploy these zero emission technologies near freight corridors. And that can have immediate health benefits.

And just stepping back a little bit I think that the -- I really appreciate the staff. I didn't go into all the thank yours to the staff, but I do thank all of you for the work that you've put into this plan. And I think others have covered that.

I think there's a really good balance between allocations for the nearer-term technologies and keeping our eye on the longer term. And I know over the years we've had this discussion about this tension between the near-term and the long-term and I just want to make sure that we keep our eye on the ball. The importance of getting the transformation, getting to the sustainable most -- you know, the cleanest, most sustainable, lowest carbon technologies that can bring us to our 2050 goal. I think that's a critical piece of this.

I want to speak up for that goal, because I think we've had a lot of discussion here about maybe reducing allocations and focusing more on narrow-term goals. So I think it's very important to keep that long-term goal in mind. And keep the funding allocations to move technologies like hybrid electric, electric, and fuel cells that have a very important role in that long-term goal.

So I just wanted to throw that out there. I do have to leave a little early, I apologize. I think this is a really incredibly important discussion. And I think that this plan, as we've talked about, is critical to moving forward on the ARB's Freight Strategy. It's critical to the Mobile Source Strategy and to the Scoping Plan.

And I think more and more we need to frame our discussions in the sense of how are these allocations moving all of these goals forward? And I appreciate we have representatives from ARB and other agencies here, but maybe we want to schedule -- maybe at the next meeting -- a more formal presentation from some of our sister agencies, like ARB, as to how this plan is moving these different balls forward. And just get a better sense of how we're coordinating as we move forward in these different planning processes.

And I know you are doing it, but it'd be helpful for us to hear a little bit more about how we are making those connections and where the gaps are. So I just would toss that suggestion out.

MR. MCKINNEY: Great. Thank you, Bonnie.

See, I think next was Joe?

MR. GERSHEN: Thank you. I also wanted to support what Tim said. I think it makes a lot of sense for certainly biofuels production.

With all due respect to Bonnie, you know demonstration by definition doesn't provide immediate benefits. It's demonstration and while we all want to go for the 2050 goal I think it's important to remind us that we also have the 2020 targets. And like I said the biofuels are providing 90 percent of all the carbon reduction and it looks like they're going to keep doing that for some time.

So I support moving some funding there, thanks.

MR. MCKINNEY: Thank you, Joe.

Ralph Knight?

MR. KNIGHT: I just want to thank staff on the support to the medium and heavy-duty advanced vehicles. I think not only demonstration, but scale up. You know, I think the yellow bus finally has an opportunity to see some electric vehicles out there running and doing a good job to make a selection.

And I think with some of the restrictions that are being held to those of us in Northern California, instead of the San Joaquin Valley, we have a tough time getting those funds to try to do that. Same thing as far as the disadvantaged areas throughout the Bay Area, not everybody can qualify for that. And I think that it's making it very, very tough for lots of us in Northern California to be able to get those fundings.

And I can tell you that a lot of people keep an eye on certain individuals throughout the State on the plus and minuses of these electric vehicles or any vehicles, any technology out there. And I think that we're not being able to see that. We're happy to be involved with the Clinton Initiative going on, to have two buses coming to us with that, that are going to be V2G, V2B.

I think the advancement of electric vehicles -- what better source do you have in a school bus fleet than a fleet that's sitting there all day long to go back to the grid? Same thing in a disaster, what better advantage do you have, but a fleet of buses sitting out there to be out there to power up all the emergency services that are needed?

So I think there's a lot of ways to be able to try to do this. And I'm not saying that -- you know, a small percentage going to Northern California is better than nothing at all. And I think if we just look at it under those terms we're gaining the same thing. We're putting clean buses out there and we're accomplishing the same things out there too.

MR. MCKINNEY: Okay. I want to go to Randy and then Steve Kaffka.

MR. ROESSER: Yeah, I just wanted to make a quick comment that I certainly appreciate Chris's comments and

Tim's comments, Joe's. And again, I mean, all of us have said this today, there's not enough money to go around in all the important areas.

But I guess in defense of the 23 million proposed allocation here, this allocation addressed several of the ideas that this Committee today voiced the importance of. The first one being oversubscription.

The last solicitation that this area did we turned away $40 million of qualified projects that could have received funding if this sector of this allocation category had more money. So certainly -- and that information, by the way, is in the plan in specific detail -- the $40 million oversubscription.

Also we talked about the need for specialized refueling structure that the heavy-duty sector is going to need for electric vehicles, hydrogen vehicles and so on. This sector speaks to that issue that some of this money is likely to be earmarked for that specialized infrastructure that is needed.

The third item that I would say that supports this allocation is the sustainable freight effort -- the Governor's Executive Order -- which is going hand in hand. And we see this playing a major role of the Energy Commission's support in working with the ARB and other agencies to carry out the Governor's order for sustainable

freight. And the last one being the Port Initiative, which was mentioned a little bit earlier as an important area that money needs to go, especially for disadvantaged communities that are in or around the ports.

So I mean right there I just -- thumbing through the plan here, those four things are -- I think support this allocation level. And again, I'm just throwing that out there.

And I also want to make the point that staff spent -- I can assure you spent lots of time discussing and trying to come up with this level. And then having to defend it to Commissioner Scott, because she's tougher than you guys are all together, okay? So for what that's worth.

(Laughter.)

So certainly we'll take your comments, but I just wanted to make the point that this wasn't just some pie in the sky dollar amount that we put in there. It was thought out. It was considered long and hard and we feel that this money is justified for the four areas that I just mentioned.

MR. KAFFKA: I guess I just wanted to make a more -- Steve Kaffka -- a philosophical point, especially given what Bonnie had said.

I know that the AB 32 Program is focused on 2050 and an 80 percent reduction by that point and time. But we

also, I think, have to be cautious about thinking we're going to know that pathway. Because it's a long time from now and we can be guaranteed that there are going to be huge surprises that are going to occur, both in terms of technology and other events that are going influence our thinking.

And I think it's also important to keep in mind that technology is incremental. We'll know better in 2025 what 2050 looks like. And we'll know better in 2030 what the technology for 2050 looks like. So I'm not saying that you've made a wrong allocation in terms of the amounts in these categories, but I just philosophically think that it helps to know that we're probably going to change our thinking as we go forward in making a 2050 investment. A huge amount of money for what we foresee as a 2050 investment is kind of a big risk.

MR. ROESSER: One last comment I'll make, and I'm going to look to Jim, because I often speak about what I don't know and Jim usually corrects me. Or two more points, let me say.

Number one, in the issue about ARB throwing -- that Chris brought up. ARB has a lot of money going to this sector, that's true. ARB is focused on larger deployments, a much, much grander scale than our money simply can compete with. And so we're trying to fill a gap

there for the more one-off type demonstrations that lead to the larger-scale deployments that end up with the environmental benefits that we're looking for.

And secondly, and this is where I'm looking to Jim to grab the microphone when I misspeak here. But this is the medium, heavy-duty sector, so this is not tied to any specific fuel type. So this is a heavy-duty sector. It can focus on hydrogen. It can focus battery, electric. It could focus on natural gas even to an extent.

So having money in this category is, I think, more wide open to be able to respond to the market needs as we roll out solicitation, which is where the details are in that. So that if in the heavy-duty sector, there is a way to potentially even leverage the low NOx engine that was talked about earlier, that potentially could be funded under this category here.

So again, this is a medium, heavy-duty category, not some specific fuel type, so I think that could warrant more money also because of the different areas we could target in these types of demonstration projects.

COMMISSIONER SCOTT: (Indiscernible)

MR. ROESSER: True. And as Commissioner Scott just mentioned, the ITS or intelligent transportation systems that we're just scratching the surface on now and we're soliciting information from stakeholders, we

potentially could push money into that area also. So again, this is just a wide-open category. And again, we're certainly going to listen to your comments and we'll look at it and discuss it with Commissioner Scott.

But again, the primary point I wanted to make is that there was a lot of thought that went into this category.

MR. CARMICHAEL: I don't need the last word, but I have another comment.

I appreciate the -- there's a standup routine, "dueling mics" isn't there? I appreciate all of your points even though I only wrote down three of them, I'll get the fourth one from you later.

But I want to encourage the staff here and the Commissioner to consider something that we've been asking the ARB to consider over the last month and a half. The introduction of a near-zero natural gas engine -- .01 gram is what it was certified at, running on renewable natural gas -- as a five, ten-year, fifteen-year or longer strategy.

Play that scenario out and compare it to the path that we've been on with heavy investment and belief that we had to go zero emission tailpipe with fuel cells and battery electrics. And look at how far we can get with this new engine technology as far as emission reductions.

How much money it's going to cost and when can we get to those various milestones?

We've asked ARB to take another look at their transit bus proposal, which is a 100 percent zero emission tailpipe proposal as drafted. And we've said, "Look, you know with this new engine that happens to be the transit bus engine size, you have to take another look at this. You don't have to agree with us. You don't have to agree with us. You don't have to reach the same conclusion. But you have to take another look, because we believe -- and this is back of the envelope, a more in-depth analysis is still being done -- but back of the envelope we believe that you can turn over the transit fleet in California, achieve the same emission reductions, and get there ten years faster for billions less -- billions less."

And I make the same point, I'm worried that Bonnie misheard me and I'll follow up with her separately. But I absolutely support this category. I supported its creation and I continue to support it. What I'm questioning is the level of funding that's being proposed. And just of the moment, if it was $15 million I don't think we'd be having this debate or I wouldn't be harping on this.

That's my lens today and obviously this is the beginning of this conversation. And it's going to continue

for six months at least, but my additional point is given this new engine, the costs of various technologies, when we can get to certain milestones, I think we need to consider it. I am not at all suggesting that California should stop investing in zero emission tailpipe technologies: fuel cell and battery electric, plug-in hybrids. I'm very supportive of continuing investments in those.

I'm just saying that it has felt like a largely all-in on those fuels and technologies, and obviously it's not all-in but it's felt like that's where the focus and energy has been. And I'm suggesting we need to take another look at that.

MR. MCKINNEY: Great. Thank you, Tim. I think it's a very, very good public discussion.

Andrew, do we have any Committee Members on the phone? One, proceed please.

MR. MUI: Hi. This is Simon Mui and thanks for staying on. And I will have to run after this unfortunately, but I do want to just support the continued funding around this category. Keeping in mind that, you know, I think over the years it's been pretty widespread support of the needs around this category.

And I would like to emphasize that the discussion in the past has always been around not that this program, $100 million a year, could do everything. And that in

terms of deployment, which I think a lot of us are talking about here, that there are absolutely these enormous needs, you know? You know, 100 million when we're spending 60 billion a year on transportation fuel alone is a drop in the bucket. But to the extent that this category has always been focused on demonstration, on areas where the other funding pots haven't been able to do as much of, I think that is kind of where the historic use of this bucket has been.

You know, I would characterize kind of the discussions right now as making Commissioner Scott pick her favorite child, you know, while we're all arguing with each other about which deserves the most. But I will say it's a little bit of a zero sum game in terms of how we allocate this. And I would hope that the alternative fuels and the vehicle industry could come together in a way that maybe doesn't make it a zero sum game anymore. And actually increase the pie.

But to the extent that this is a very important bucket from NRDC's perspective I wanted to voice that. I will also send the Energy Commission a recently released report that NRDC did with the Electric Power Research Institute. It's a good several hundred pages, very detailed analysis, on transportation electrification in terms of including on the freight off-road side, in terms

of also criteria pollution reduction and GHG emission reduction.

So I think that it isn't to say that these are silver bullets, but I do think it's sort of a silver buckshot approach here. And you've got the tough job of deciding how best to optimize that. But again, we support this as one of those key areas to optimize. Thank you.

MR. MCKINNEY: Great. Thank you very much, Simon, for your thoughtful comments.

I have two blue -- oh, Brian did you want to?

MR. GOLDSTEIN: Sorry, yeah. It's Brian Goldstein from EIN. I'm going to have to leave now as well. I had a couple of brief comments on the next section. I thought we were just finishing up medium and heavy-duty. Is that okay to go ahead and make those comments? Sorry, to get off --

MR. MCKINNEY: And just before -- I just want to be sure, because I know Erin's been waiting. And we also have Vincent, is he here in the room? Okay, great.

Okay, so I've got your cards, both of you.

MR. GOLDSTEIN: Okay. I'll keep them brief and thanks again for the opportunity to speak.

Okay. So in the next category I've got comments on the emerging opportunities in regional readiness. The emerging opportunities, I think, is a great area where we

can allocate a very small amount of money toward researching centralized hydrogen production, certainly centralized renewable hydrogen production.

I think the impact there, again just by funding research in that area, has the potential to be huge. I think there's a potential it'll lower station costs, certainly as it would apply to stations that onsite production. The ability to look towards centralized production, I think, really could have a huge impact there. It would certainly lower the impact of hydrogen fuel production at this point. I believe the AB 8 Report from ARB pegged our current hydrogen production at about 45 percent renewable. So the ability to go to 100 percent renewable, there's obviously an opportunity to pretty much double the improvements to the environmental impact of hydrogen production.

And third, I think it would give us an opportunity to look for funding elsewhere. I mean, as Commissioner Scott mentioned there is a lot of overlap as far as the other energy sectors that have the potential to utilize that renewable hydrogen. And if we can help find funding or other agency funding to contribute towards this goal it would help alleviate some of the competition between sectors here. So that's all I have to say about the emerging opportunities.

On the regional readiness, I wanted to make one point again about hydrogen funding here. So it's the last, last one here. In the '14-'15 Plan, I think, for regional readiness there was about $900,000 appropriated for readiness planning for fuel cell electric vehicles. And I believe about a little over 500,000 of that was actually allocated out to FCEV Readiness Program. So I think that program wasn't undersubscribed and I'm sure there were various reasons why the full amount wasn't awarded.

But we're talking about really a very small fraction of the overall budget and certainly a small fraction of the budget just for this category alone that could go a long way in toward getting these stations open much earlier. So there would be faster deployment of stations, and I think community readiness planning would certainly have a big impact there. I think that would enable faster adoption of the vehicles. It would also have the opportunity to advance training and development and improve the emergency responder prep that we've heard about from, I believe, some of the call-ins today.

So I just wanted to make that point. Again, thank you very much for the opportunity to speak on the topic. And thanks for organizing the meeting today.

COMMISSIONER SCOTT: Thank you so very much for being here, for your excellent thoughts.

MR. MCKINNEY: Yeah, and I think you're based in L.A., so thanks for coming up and spending the day with us Brian.

MR. EVANS: Thank you.

MR. MCKINNEY: Okay. With that I want to recognize the patience of Erin Evans and then Vincent Wiraatmadja?

MR. WIRAATMADJA: Wiraatmadja.

MR. MCKINNEY: Ms. Evans?

MS. EVANS: Thank you. As you can see I was very eager to talk to you today.

I'm Erin Evans representing the Small School Districts Association. We're very supportive of the $23 million and the Medium and Heavy-Duty Vehicle Demonstration Project.

Just to give you a little point of view from the school district's perspective, the school district perspective really school buses are the largest form of mass transit in the country. And on a daily basis about 480,000 school buses transport nearly half of our children in the country, nationwide. And as you know, children are a particularly sensitive group to air contaminants by diesel emissions. And we really appreciate the opportunity provided by this level of funding as well as the Air Resources Board funding to be able to get some zero

emission and low-emission school buses in our school districts.

These matching funds, as well as those from the Air Resources Board, really to make or break a school district's ability to purchase low and zero emission buses. So we really appreciate that opportunity and we're very supportive of that. Thank you.

MR. MCKINNEY: Great. Thank you.

Vincent?

MR. WIRAATMADJA: Hi. I'm Vincent Wiraatmadja on behalf of BYD Motors Inc. We're an electric truck and bus manufacturer based out of Los Angeles, California. And we just want to say that we strongly support the $23 million that the CEC has put forward, especially on the infrastructure front it's very important that you set up some incentives in order to build up the infrastructure support, zero emission, better electric vehicles.

And we'd also just like to say that electric trucks are very much on the horizon. We're actively developing rubber tire gantry trains, drayage trucks, and urban delivery trucks that are completely zero emission. And we feel that these would be very helpful to hitting the Governor's Executive Order on freight.

So thank you for your support. We appreciate it.

COMMISSIONER SCOTT: Thank you.

Let me ask both Erin and Vincent, if you have a business card if you'll give it to our reporter there, to make sure he gets your name and title right that would be terrific. Thank you.

MR. MCKINNEY: Okay. I did not get any blue cards. Andrew, do we have anybody on the phone speaking too?

Okay, we'll take those. It's getting late here, so let's respect the three minute limit. Is there a preference in the order, Andrew?

ANDREW: John Reed.

MR. MCKINNEY: Sorry?

ANDREW: John Reed.

COMMISSIONER SCOTT: I'd like to -- we've had an opportunity to hear quite a bit from John Reed today. Thank you so much for your important comments. Might I ask, because we are running a little tight on time, that we hold you until the public comment period at the end? And maybe you can make points on each of the last couple of components at the same time. We would really appreciate that if you're willing to do that?

MR. REED: Yes.

COMMISSIONER SCOTT: Okay. Thank you.

MR. MCKINNEY: Okay. And then the other --

COMMISSIONER SCOTT: Who's the second one?

ANDREW: Urvi Nagrani.

COMMISSIONER SCOTT: Great. Go ahead, Urvi.

MS. NAGRANI: Hi. This is Urvi Nagrani from Motiv Power Systems and I wanted to say that I appreciate the nuanced discussion happening around this and also the allocation of 23 million specifically for medium and heavy-duty vehicle technology demonstrations.

I think it is very important, especially given the oversubscription on this pool of funds within the previous years, that that funding be increased. And I also think it's important to note that the early stage demonstrations can lead to projects that are eligible later in the pipeline, even within the CEC before they get to the point that is eligible for CARB funding.

A key example is our first generation of electronic power train control systems was funded under a grant from this pool of money. And that first generation to make a shuttle bus, was used in a very different way with very different vehicle partners, to power the first all-electric school buses that were made and certified to carry kids, as well as the first all-electric refuse truck in all of North America.

So that technology transfer capability within the medium and heavy-duty truck applications is key to the funds being well spent. But it's also important to note

that a school bus manufacturer is never going to make the actual refuse truck body. And so you're going to have to have different projects with different vehicle partners, different market segments and there will be some technology developments necessary.

And so not only is this funding necessary, but as the applications are expanded to include additional freight opportunities to help meet the Executive Order that the Governor has laid out we're going to need even more than what's currently in this bucket. And I realize that that's not a popular opinion with some of the folks coming from a biofuels standpoint. But the technology needs in the diversity of applications are going to require a lot more long-term investments. And because this is the seed funding for where that goes in the future we need to be thinking today about where we want to be in the coming decades. Thank you very much.

MR. MCKINNEY: Great. Thank you, Urvi.

And I think now Mr. Freeman's up?

MR. FREEMAN: Okay. We do not have the hours necessary to do this topic justice, so I really just want to tee up the Sustainable Freight Pilot Project's idea. And then the last side we have has some contact information on it so if you have some follow-up questions please, please, please feel free to contact us.

The major takeaway for these slides are going to be a November deadline, so please pay close attention to this.

So as part of the Sustainable Freight effort that you've heard about throughout the day, the Executive Director directed the Interagency Work Group to identify pilot project activities that can make significant steps towards transforming the freight sector whether this be using biofuels, advanced technologies, logistical improvements to the way the freight moves throughout the State. And then efforts that will help maintain the strong economic force that is the freight sector in California.

We're looking for large transformative projects, again emphasis on large, so we have gone out to interested stakeholders to identify these. I think it will resonate with a lot of the folks around the table who all have additional needs for funding that again our 100 million can never help out with, a need for additional policies and regulatory actions that kind of help move the freight sector to the next step.

So we definitely want to have everybody that's interested in anything freight sector related. Any major advancements that you think your organizations, your stakeholder groups are interested in pushing and getting those ideas to us, so that could be everything from

transportation-related activities, renewable energy, building related. You know, we don't want to constrain people's ideas as far as what can be done to make major advancements to bring cleaner technologies to the freight sector.

So if you would like more information on this, again I would highlight that these pilot project concepts that we're requesting are due to us by November 30th, so that we have time to digest them, take them to public workshops, get public stakeholder feedback on what they think about the pilot projects. You can go to this link and we'll be posting this on our website later. And we'll probably send it out to our Transportation Listserver.

So we will be reviewing these during the month of December as a work group. Hopefully, we'll get those out to the public some time in January. So again, if you have any questions if you go to the Air Resources Board's website we've kind of consolidated where you can submit information. Contact emails for each of the folks that are participating in this effort and you're always welcome to contact AB 118 staff if you have any other questions for this. So thank you.

MR. MCKINNEY: Okay. Andre, you and I haven't talked about this for awhile. Is this request for concepts and ideas linked to any specific solicitations we're

developing?

MR. FREEMAN: So, no although any ideas that are brought to the work group through this will definitely be considered by all of our various funding programs as we go and make policies at each of the agencies. You know, this type of information's very helpful to know what new ideas are out there, what old ideas people want to expand and bring to the table.

So for things like our upcoming Medium and Heavy-Duty Demonstration Solicitation we'll definitely be looking at concepts proposed and have that integrated into our thinking for our solicitations.

MR. MCKINNEY: Okay. Thanks very much, Andre.

Okay. Why don't we go back to the funding side and continue?

COMMISSIONER SCOTT: Yes. Do you want to do that last three together or --

MR. MCKINNEY: Sure.

COMMISSIONER SCOTT: -- or let me just ask a question around the table for the Advisory Committee members who are left, thank you for staying.

Would you like to do the last three, which is kind of emerging opportunities, workforce development and regional readiness together? And make your comments on all three or would you like us to continue to go one-by-one on

those?

(Colloquy from members.)

COMMISSIONER SCOTT: Okay, great. So we'll do them together. Who would like to comment first?

Claire, go ahead.

MS. JAHNS: I'll say that collectively all three of them, I think, are really important. And you've clearly recognized by holding money aside in these more flexible categories -- and especially the emerging opportunities -- just to hold some funds aside for things we don't know about is important in this rapidly developing space.

And I wonder if that can be use and I would imagine it's oversubscribed typically. But even if it can't be used it could surely supplement some other kind of fringe elements of projects in other categories.

And just also that there's money for planning and just thinking and strategizing is really important to complement the GGRF Funds, which cannot be used for planning. And so I mean, I think it's true for all of them, but for regional readiness. Like we've talked about the potential to do regional biofuel systems or other -- the kind of regional approaches that will require a lot of planning, looking at zoning changes, potentially working with communities to get community involvement as well.

And that the GGRF money just can't be used for

those things, so it'd be useful to maybe look at particularly how this money can best compliment some of the other categories that are funded here as well as through GGRF.

COMMISSIONER SCOTT: Thank you.

I see Sekita and then it looks like Tim.

MS. GRANT: Thank you. I'd definitely like to second that last point about thinking about complimenting the GGRF money by really looking at how we can use ARFVTP money to focus on some of the planning opportunities through that regional readiness pot of money, which I think is very important.

Just to touch on workforce investments and put my hat in, in support these are very critical in terms of preparing a workforce to support these new technologies. And it also provides great economic benefits for local communities.

The apprenticeship programs that you are starting to get into, we are very supportive of and happy to have further conversations about what those could look like. And the only question I have is around kind of understanding which communities are benefiting from the workforce programs?

And seeing if we can help bring in more underrepresented groups into that workforce: women,

disabled vets, minorities, LGBT communities, and seeing if we can help diversity the workforce that's supporting a lot of these great clean fuels and vehicle technologies.

And the last thing I'll say is that just encouraging the Energy Commission to think about how you're communicating all the great work that you're doing. There's just a ton of amazing projects and information that the Energy Commission is producing every single year. And this looks different depending on your audience, but certainly the potential fuel technology users really getting information out there about the different technologies that are being funded.

And that looks different whether it's a potential purchaser of this new Cummins engine vehicle or someone who might be interested in getting a charging station in their small business. But really getting kind of the word out on this would be fantastic.

And the other key audience as well -- and I know you guys are really aware of it. But in terms of how the legislators perceive this program or their awareness of the program, I think there can be a lot to help elevate. And that's on stakeholders as well to support that, but to help elevate the great work that you guys are doing.

And then also the private sector, just thinking about this through the conversations we're having on

renewable natural gas. And how we can get large fleet owners more engaged in these discussions, whether it's UPS or Wal-Mart, these large companies that are starting to invest in natural gas vehicles, how do we get them more informed about the opportunities and get them to support renewable natural gas as a potential fuel source?

Thank you.

COMMISSIONER SCOTT: Thanks so much, Sekita.

I will add that we would warmly welcome the opportunity to brainstorm with you, and with any of our Advisory Committee members or stakeholders, how to do the broader outreach. So we did put together, last year, a series of kind of ARFVTP but we didn't call it that, we didn't have the whole title there, 101s and went to various areas of the State to try to outreach.

We worked with the Legislature and asked them if they would send out that notice to their contacts, because here at the Commission we end up with kind of a self-selected list of energy wonks. And that's a great list of people, but we're always thinking about how do we do broader outreach? How can we reach out to a broader set of people? So I warmly welcome your thoughts on that or any folks from around the table?

Do you have a thought on that or should I go to Tim and then to you?

MS. JAHNS: I did.

COMMISSIONER SCOTT: Okay. Go ahead, Claire and then we'll go Tim.

MS. JAHNS: This is Claire at the Resources Agency again. So the Resources Agency did not get one, but other agencies received a technical staffer for some of the GGRF programs and Erik might know about this, for ARB. And the purpose of this was to try to reach out to disadvantaged communities in particular, and help wade through the cumbersome and diverse applications for the different programs that exist within GGRF.

So I wonder if there might be an opportunity to piggyback on the technical lead through ARB who's doing this type of work. And that'd be a question for ARB in terms of whether or not they have that capacity, but certainly maybe that means just kind of sharing road show audiences or mailing lists.

COMMISSIONER SCOTT: Thank you. Tim?

MR. CARMICHAEL: Thank you. I agree with the comments that Claire and Sekita made. And I support the proposed funding allocations for all three of these categories.

COMMISSIONER SCOTT: Go ahead, Steve.

MR. KAFFKA: I generally agree. I just want to say with respect to things like workforce training and

development it's always a question of training and development for what, for what jobs? And really I think that you have considered that there need to be employment opportunities and businesses developed in State as a function of these investments. And that is important to keep in mind in terms of the total Investment Plan.

I mean, some ideas are certainly futuristic and long term and we need to have those, but concretely you can't train somebody for a technology that's only going to be around 2030.

COMMISSIONER SCOTT: Any others here at the table from the Advisory Committee? Do we have any Advisory on the phone? Do we have Simon still?

MR. MCKINNEY: So nobody on the phone, but we do have a blue card from someone in the room. And then I want to represent somebody else who's been trying to call in as well.

Is Mr. John Brauer?

MR. BRAUER: I'm John Brauer. I'm the Workforce and Economic Development Director at the California Labor Federation. And we represent and our affiliates represent 2 million workers in the State of California.

A couple of things, I wanted to support the comments of Peter Cooper earlier. We have worked with a number of our transit unions and transit agencies to access

the ETP dollars that you have put forward. We'd like them also to be light rail eligible as they were in the first round in addition to the buses, but those apprentice programs and those journeyman workers at those transit agencies have been able to respond through being retrained to the transformation.

And it kind of addresses your point around as the technology changes there's actually a workforce training and development system that our unions and our transit apprenticeship programs are part of, as this continually moves on in our clearly clear paths and high-paying jobs.

So the idea of if you can make more money available to ETP it's -- as somebody who also sits on the Governor's Workforce Development Board and also just participated for the last nine months in the State Board of Governors, Community College Chancellor's recommendations for retooling career and technical ed in the State -- these are some of the most accountable workforce dollars that are out there compared to even what the Workforce Development Board and other agencies do. You're accountable for having folks actually getting jobs and working, being trained and actually having the training take place and being retained, and having good quality jobs.

So I just wanted to articulate that to support ETP in considering getting them more money available. We

have other transit agencies that I think our labor unions have told us would be interested in it. So I think the demand is there.

We'd also be more than happy to be engaged around a discussion around inclusion and diversity. And having, we think, some capacity also to help articulate how to create those clear pathways whether that's apprenticeship or even pre-apprenticeship in that like. So I just wanted to put forward to you, and thank you.

COMMISSIONER SCOTT: Thank you very much for that. And if you'll remember to -- I see you heading towards him with the card. Thank you.

Any other?

MR. MCKINNEY: Yes, Commissioner. If I may, a gentleman named Bill Lady (phonetic) was trying to call in earlier.

He said he'll send written comments, but just so everyone understands Mr. Lady has a project proposal or concept for renewable hydrogen, a central station hydrogen project, that would tap wind energy from some unused turbines down in the Palm Springs area. And run the electricity through an electrolyzer and then sell 100 percent renewable hydrogen to the SunLine Transit District and its fuel cell fleet.

So that's just the headline really, but that'll

be more substantive comments coming in from Mr. Lady.

Commissioner, those are all the comments and cards that I have if you --

COMMISSIONER SCOTT: Okay. Terrific, well why don't we make a call for any additional public comment if you had a blue card, if this is -- or you want to raise your hand please do so with Andrew.

But let me let you know that written comments on the Draft of ARFVTP Investment Plan are due on November 16th. So please be sure to write down all of your great thoughts to get to us, so that we have a chance to look at that and review it as we're working to transition between the draft and the next draft.

I wanted to say thank you so very much to Jim and to Jacob. Jacob, I think you did a fantastic job with your first try on the Investment Plan. So I appreciate your good hard work there.

And also to all of the Fuels and Transportation team, because they work really hard on all of these categories to put out great solicitations to get good projects and really get them going every year. So I just appreciate the really good work of the team.

I will echo Jim's remarks to Randy and thank him so much for his leadership for this program. He tried to retire, but we brought him back. And this time I guess we

have to let him, but it's been wonderful to work with him. And I'm sad that this is your last ARFVTP meeting.

I want to say thank you so much to the Committee Members, especially to Claire and Jack and Sekita and Ralph and Tim for sticking it out to the very bitter end. I don't think we have anyone on the phone that I'm missing, but thank you to all of you.

I mean, your insights here and your expertise are so valuable to us. We really are listening. We take what you say to heart. We're going to take it back and have really good discussions, I think, around. And so I just appreciate the time and care that you dedicate to this program.

And also to our engaged stakeholders I'd just like to say thanks to those folks as well.

I think this is a really great program. I think we've got projects that are demonstrating how you can transform transportation in California. They are across a pretty broad swath, but that's to me what makes it exciting. There's never a dull moment. We're always learning something new, so I'm just really pleased to be able to be a part of this.

I will thank again, very heartily, all of the Committee Members for your great work and for your time here today.

Did we have any last public comments on the phone, Andrew? Yes, let's do the last one. That's probably Dr. Reed?

ANDREW: Yes.

COMMISSIONER SCOTT: Yes, Dr. Reed, please go ahead.

MR. REED: Yes. Janea, thank you for your patience and I have submitted some written responses and I will add some more.

I just wanted to go with one final thought for everyone there. And it was sort of (indiscernible) slide, which showed the one bus equating out to a thousand buses. And the point that's really made there is that the emissions are in the legacy fleet. In other words, that old bus, one 1985 bus, pollutes as much as the entire current San Diego MTS system.

So for us to put money into taking the older vehicles and updating them to current technology is where we get the greatest bang for our buck in terms of emissions reductions of greenhouse gas, particulate matter removal, and NOx.

So in the funding that you're looking to do for natural gas vehicles, for both incentives and in the near commercial production, I suggest that you make it a priority to fund technologies and incentives for taking the

older currently in-use vehicles and updating them to current technology.

That is happening, those technologies are in development, and some of them will be CARB certified here hopefully within the next 30 days.

I do this and point this out, because I feel that we are so close to actually attaining the goals of getting biomethane used in a large amount in fleets that are actually able and capable to do it, that are in substantial numbers. So we can actually have a real impact and reach the goals we've all been shooting for.

So I appreciate your patience in listening to me. And thank you for all your hard work.

COMMISSIONER SCOTT: Thank you. Thank you very much for all of your thoughtful comments today.

And with that, one last hardy thanks to our awesome Advisory Committee. I hope you guys have a wonderful weekend. We are adjourned.

(Whereupon, at 4:27 p.m., the meeting and workshop was adjourned)

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I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

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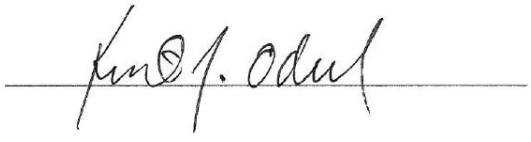

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