BUSINESS MEETING

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

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Special Business Meeting)
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PETERS SHORTHAND REPORTING CORPORATION
3336 BRADSHAW ROAD, SUITE 240, SACRAMENTO, CA 95827 / (916)362-2345

COMMISSIONERS PRESENT

Jackalyne Pfannenstiel, Chairperson

James D. Boyd

Jeffrey D. Byron

John L. Geesman

Arthur H. Rosenfeld

STAFF and CONTRACTORS PRESENT

William Chamberlain, Chief Counsel

Michael D. Jackson, TIAX, LLC

Lana McAllister, Acting Secretariat

Tim Olson

Rosella Shapiro

ALSO PRESENT

Richard Epplet, Quality Transport Services

Joe Sparano, Western States Petroleum Association

Catherine Dunwoody

Jamie Knapp, Environmental Coalition

Danielle Fugere, Friends of the Earth

Francisco Gutierrez, Caltrans

John Shears, CEERT

Dwight Stevenson, Tesoro Refining and Marketing

Victoria Junquera, ERM

Barbara Fry, Air Resources Board

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P R O C E E D I N G S

9:02 a.m.

CHAIRPERSON PFANNENSTIEL: Good morning, this is a Special Business Meeting. We'll begin, as we do our business meetings, with the Pledge of Allegiance. Please join us.

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

CHAIRPERSON PFANNENSTIEL: We have before us an agenda with a single item, which is the possible adoption of the State Plan to Increase the Use of Alternative Transportation Fuels in California, Assembly Bill 1007, Pavley, Chapter 371, Statutes of 2005. This report evaluates alternative fuels from a full, fuel cycle assessment of emissions of air criteria pollutants, air toxics, greenhouse gases, water pollutants and other substances.

I think before we ask staff to introduce this I am going to ask Commissioner Boyd to introduce the subject. Commissioner Boyd.

COMMISSIONER BOYD: Thank you and good morning, everybody.

I think it is no secret to most people but I think for the record we should point out

that while the hearing notice indicated that we might possibly consider the entire AB 1007 report, Alternative Fuels Plan for the State of California, I think it is pretty well-known, and I apologize to anybody who didn't hear this, that we informed the Governor and the Legislature early this week that because of the incredible complexity of this issue and its recognized need to be integrated with other actions that have been taken since AB 1007, or while AB 1007 was being approved, such as the Governor's efforts on a biofuels program, his bioenergy action plan and executive order, and then later in the process his executive order on a low-carbon fuel standard, all of which have to be integrated and nested, as I like to say, with the alternative fuels plan. And because of extraordinary efforts on the part of all involved to try to finish this plan on time, falling a little short because of these extra requirements.

We indicated to the Legislature and the Governor our desire to bifurcate the plan into, let's just say two pieces. And that is, today we are going to consider the full, fuel cycle analysis or what I would call part one of the

plan, which has consumed far more time, effort and resources than I think was anticipated when we ventured into this arena because of the recognition of its incredible importance to the low-carbon fuel standard.

And I know we directed our staff and our consultant to make extra efforts to deal with this plan, to deal with this analysis and to dive deeper than perhaps we were going to under the original charter of AB 1007.

This has just consumed such a great deal of time that we have decided, as I say, to bifurcate the effort. Consider today the full, fuel cycle analysis considered by the Commission as a whole. And if approved by the Commission, to pass it on to the Air Resources Board as indicated in the Governor's executive order regarding the full, fuel cycle analysis work and its correlation and relationship to the low-carbon fuel standard.

And then consistent with the incredible request volume. I mean, there were over two dozen folks, stakeholders from various disciplines who starting at our workshop and even after we closed the record on the subject, were piling documents and requests at our front door, so to speak.

Asking for more time to deal with this plan in recognition of what I have said, the complexity of it.

We decided to yield to our instincts with regard to the preparation of the plan, and particularly yield to those many, many requests for more time, and to provide you more time to reopen the record and to indicate to the Governor and the Legislature that we were going to add about two more months on to this process in order to facilitate continued stakeholder meetings, additional inputs, in order to, let's just say from your point of view and ours, to get this right.

Because I think it has been well-recognized, the ramifications of this plan on the actions of the state of California and all the stakeholders in the future transportation fuel arena were going to be quite significant.

A new paradigm has been called for by many, including this body, for years. And I think a new paradigm in the transportation fuel arena is well-recognized by everybody now as being inevitable in one form or another.

Therefore as indicated today we will

deal with the full, fuel cycle analysis and we will be back in the future. In the meantime, having worked with all of you and other affected parties on the completion of the plan, or part two, I would say.

So with that introduction, Ms. Shapiro, shall we begin the staff's presentation? I believe Tim Olson, our probably weary by now project manager is prepared to give us an introduction.

CHAIRPERSON PFANNENSTIEL: Thank you.

COMMISSIONER BOYD: Thank you, Madame Chair.

MR. OLSON: Thank you, Commissioners. This morning we will provide a status of the AB 1007 plan and kind of the steps in completing that. We are going to show you how the Full Fuel Cycle Analysis fits into the overall scheme and then we're going to seek your approval of that Full Fuel Cycle Analysis, the methodology and related findings.

I guess the way to kind of describe the organization. I have provided a short overview of the AB 1007 update. Mike Jackson from TIAX will summarize the Full Fuel Cycle Analysis Reports and

then we will open for questions and comments and then seek approval of the resolution.

You'll recognize these trends and issues. They were the major drivers that stimulated our interest in the transportation issues in the year 2000 and they are still valid today. In fact they are more intense and they are more complex today.

You'll find that it's -- What we found is it's becoming increasingly more difficult to respond to, to analyze and respond to any single one of these issues in that each one of them affect each other. As we go forward in this we're discovering that we'll need to account for the multiple consequences of each, individual initiative that comes out, flows out of these topics. The increased demand growth, greater petroleum fuel price volatility and this more complex, environmental impacts that we're seeing from the transportation sector.

We are also -- The first two strategies on here are going to be addressed in detail at a July 12 IEPR, CEC IEPR workshop in Los Angeles. The third is the topic of today.

And then I'm going to go through -- The

next two slides illustrate what Commissioner Boyd was saying about the complexity of how government is responding to transportation fuels and energy issues, to energy and environmental issues.

And just to kind of point out, this first slide summarizes what we call the petroleum dependency, or efforts to reduce petroleum in the transportation sector, started with the CEC. And CARB adopted goals to reduce petroleum dependency, which led to AB 1007 to develop an alternative fuels plan. And this has been embellished by the Bioenergy Action Plan, directing us to look at increasing in-state fuel production from biofuels.

The complexities become more -- This becomes more complex as we start adding in the environmental initiatives, laws, policies, regulations that either reduce greenhouse gases or reduce criteria air pollutants.

Each one of these initiatives listed here has had a single, tend to have a single focus and has led to, when you look at it is a whole, kind of this question of what's the comprehensive impact if you start looking at these things together. Each one of them was addressing either reducing petroleum dependency and seeking

alternative transportation fuels, reducing vehicle miles traveled or reducing environmental impacts.

The challenge we're seeing here for AB 1007 is that AB 1007 blends a lot of these objectives into one report and compels us to look at each one of these issues as a combined effort. And we will need to address potential double-counting and double-crediting from a policy standpoint and a financial investment. This has been, this has been one of the factors that we faced, wrestled with. For both agencies we're finding that it's a key factor with most of the stakeholders.

This is a summary of the AB 1007 requirements. Many of you are familiar with this. I need to point out that even though the plan emphasizes the increase in the use of alternative fuels we are acknowledging and touching on in our report the need for fuel efficiency measures and land use planning efforts to fulfill the overall goals, the comprehensive set of goals.

This slide here indicates where we have completed work. And just to kind of run through briefly. What we are discussing today is the Full Fuel Cycle Analysis Report, which has several

components to it.

You have in your binders and out on the front table the combined Well-to-Wheels. There are several elements that feed into developing that summary, including some very complicated model designed for California conditions and numerous spreadsheets that went into the development.

This has been peer reviewed substantially. It has gone through one workshop and probably 20 or 30 different meetings, individual meetings to get this to a point where we feel comfortable using this as a tool to analyze the comprehensive environmental footprint.

I have on here we used this to quantify 62 fuel pathways. That's just for neat fuels. We also had I think 10 or 15 blends and several more pathways that were combinations.

We also feel that what we have done with this fuel cycle analysis is advanced the state o the art of this methodology. From this point on it is pretty clear that we're going to be using a life cycle or a fuel cycle in pretty much all of our analyses. And this probably will carry over into other sectors beyond transportation.

The other point I want to make here is that we are not wed to any single model even though we used this California-modified GREET. In fact we encourage other models to be developed and used. We think into the future a key thing we want to accomplish is improving and refining the data, the inputs, the assumptions, and doing that in a very transparent, open process. That has been a key to getting this developed so far.

We have also completed several draft reports on alternative fuel scenario story lines and there's the kind of contents listed there in the second bullet. These are several reports that we are now in a position of we need to combine this into a plan and discuss this with many of the stakeholders and different interest groups about what the consequences and implications of that combined plan is. That's what Commissioner Boyd was suggesting that we needed the additional time to do.

We have also completed a survey of fleet managers. We received the UC technical analysis for the low-carbon fuel standard that will be inserted into AB 1007. And you can see the efforts we have gone through with the

stakeholders.

So what is still left to do? The July 12 workshop on transportation demand assessment and the fuel price forecast is a critical piece of information that we will need to update our analysis. That is one of the factors in asking for this extension. We are using right now 2005 data for those two areas so we're hoping that any new data will give us a better reflection of the world today.

We are expecting to have a final plan ready some time in August and seek a CEC adoption of the plan some time in September.

And I think that's where I am going to stop my summary. At this point I would like to introduce Mike Jackson from TIAX who will do an overview of the Full Fuel Cycle Analysis.

MR. JACKSON: Thanks, Tim, and good morning, Commissioners. What I wanted to try to do today is give you, as Tim said, an overview of the Full Fuel Cycle Analysis as put together for AB 1007.

I need to acknowledge some of our team members. Jennie Pont, who is in the audience, has done a lot of work on this. You want to raise

your hand anyway. Okay, thanks. Matt Hooks, Larry Waterland, Mike Chan and myself have all worked very hard on this effort.

And what I want to try to do is go through an overall introduction then walk through a little bit on the methodology, explaining how the various pieces fit together. Give you one slice of some example results for the light duty sector only. But keep in mind that this methodology works for not only light duty but heavy duty and non-road vehicles as well.

And then finally I wanted to end just kind of summarizing a couple of slides showing how the results might come together when you're thinking about putting together policy or plans for AB 1007.

So let me walk through the introduction. I think Tim has said this already, but in AB 1007 it requires the Commission, in cooperation with ARB and other state agencies, to develop and adopt a state plan to increase the use of alternative transportation fuels.

And one component of that plan is a full fuel cycle assessment, which includes not only greenhouse gas emissions, which are important, but

also criteria air pollutants, NOx, CO, PM, hydrocarbons. Air toxics, which are firmly a part of the hydrocarbons, greenhouse gasses as I said, but also other multimedia effects such as water pollution. And then any other substances, as written in the legislation, that damage human health.

And in the context of AB 1007 alternative fuel meant a non-petroleum fuel including electricity, ethanol, biodiesel, hydrogen, methanol or natural gas and we added a number of other of those to the analysis.

The plan shall set goals for 2012, 2017 and 2022. CEC and ARB added 2030 and 2050 because many of these technologies we're looking at really are in the out years and not really in the near-term years.

Some of the goals that we were aiming towards here was really to determine and understand what the emission footprints are for various technologies and how they -- not only from an air emissions but also how they might affect other multimedia impacts.

And then are there really any net material increases in any of these sort of

pathways that would affect emissions or human health that we need to deal with. And if they did pop up how would you mitigate them, potentially, to get them into the, get those technologies into the marketplace.

And then use, the tools should be used as guidance in developing the plan, of course, considering not only GHG emissions, but also I think just as important is petroleum displacement. And we'll talk about that as we go through some of these numbers.

Also it was used and probably will continue to be used in helping develop the metrics for California's low-carbon fuel standard as adopted by, as suggested by the Governor's Executive Order S-01-07.

And then finally I think it should be in the context of California' Global Warming Solutions Act of 2006, AB 32. That's another place yet where transportation is going to need to reduce substantially greenhouse gas emissions. And as such this tool could be used to help understand where those emissions are and what kind of strategies could be used.

Just for a sort of history here. The

draft of this Full Fuel Cycle Analysis Results were published in February and we held a joint workshop here at the Commission on the 2nd of March and we received lots of constructive comments. In general we tried to address all those comments. Did we get it all right? Probably not. There are still lots of things that could be improved in this. But our attempt was to be as responsive to the comments as we possibly could.

The report is on-line now. A copy is out here on the desk. This still has some minor errors in it but it does do a good job of going through and laying out all the final results for all the different pathways.

Let me kind of walk through what a Full Fuel Cycle Analysis is to remind us the context of this. Generally what we are trying to do is track the various emission events that occur throughout the total cycle of where a fuel is produced in terms of production, where it is processed, where it is stored and then how it's transported. Maybe to California. Then it has to be bulk stored again. And then maybe local transportation and distribution has to occur and then final use in

the vehicle.

And remember, we are trying to do this not only from the perspective of emissions that are occurring all throughout the cycle but we're trying to look at it from the perspective of those missions or boundary conditions. What's happening in California, what's happening in the rest of the world, what's happening in the United States.

This first sort of click here shows you potentially, at least the way we have looked at this problem, out of California emissions. In other words, the production of mostly oil on a marginal basis. The next barrel of oil coming into California is going to be imported into California and it is going to be processed outside of California. Or it will be processed inside of California in the case of some biofuels and you'll have to offset those emissions.

There are a number of emission events that occur in and around the boundaries of California such as the ships coming into California. You count those emissions within 100 miles. You have bulk storage events that are occurring in and around. You have the local distribution of the fuels and the truck emissions

that occur. You also have evap emissions coming off of the gasoline distribution tanks.

And of course in a vehicle you're going to have emissions coming not only from the tailpipe but also from evap emissions.

And then finally you can look at other multimedia impacts and where those impacts are occurring. So boundary conditions here are an important part of this problem and you need to consider where they are occurring.

In general, carbon is happening worldwide. CO2 emissions are happening worldwide. We're tracking the carbon throughout the cycle whereas on the criteria pollutants we're really looking at those criteria pollutants that are generated inside California. Or those toxic emissions that are generated inside California. Similarly for multimedia.

GREET, which was developed by Argonne National Lab, was used as a backbone for this analysis. It was version 1.7, there is now a new version out. And dare I say, there will probably be many new versions out in the future too. So it's something that will be continually updated. Continually improving the data input, continually

improving the types of methodologies and analysis that are done within that, within the context of it.

But we also try to make this very California-centric in the sense of adding in emission factors that came from EMFAC model 2007, which ARB helped us run that. Also the new off-road model from ARB was used to bring in emission factors.

The other important part of this is knowing what the various transportation distances are. Making sure that you're accurately accounting for sort of the average transportation distance that occurs relative to the tankers, relative to the tanker ship, relative to the tanker trucks and trying to account for all that.

The methodology is really broken into two aspects. What we call the tank, the well-to-tank. That is counting all of the emission factors that are happening during production. Going from -- From getting the resource to refining the resource and getting it to the vehicle tank.

And then the next step is understanding what happens when you go from the tank-to-wheels.

The important part of that is knowing what the vehicle fuel economy is or how much, what the duty cycle is or how much fuel is being used.

So that is an important part that goes into the combined Well-to-Wheels Report, giving us an understanding of what the energy use is, what the greenhouse gas footprint is, what the criteria emissions are and what the toxics are on a gram per mile basis throughout the total cycle of the fuel. So that's an overview of the methodology.

COMMISSIONER BOYD: Mike?

MR. JACKSON: Yes, sir.

COMMISSIONER BOYD: Is it fair to say that we have all learned that well-to-wheels is a generic term to represent field-to-wheels or dump-to-wheels or et cetera, et cetera, et cetera in the stew here?

MR. JACKSON: A generic term to sort of imply. The well is any feed stock, so to speak, not just necessarily taking oil out of the ground. So correct, Commissioner Boyd.

This chart here gives you a little bit of an idea of the complexity of this kind of analysis. On the left hand side you see the different feed stocks, so to speak, for making

these fuels. Starting out with petroleum, going all the way down to nuclear energy. But in-between there's lots of different biofuels that you possibly think of.

And then sort of on the right-hand side are the finished products or fuels that you would be using in your vehicles, diesel, LPG, LNG, Fischer-Tropsch diesel, which is a subset of diesel, methanol. Some of these are alternative fuels, some of these are conventional fuels. Some of these could be blends of alternative fuels and conventional fuels.

And in the middle you have a sort of complex refining, processing that needs to go on and various things have different ways of getting there. For example, corn today is a fermentation process leading to ethanol. Whereas you might take a municipal waste and take that through a gasification process leading to potentially -- that could go to ethanol but it could also go to a Fischer-Tropsch diesel, for example.

So you can see that there's many different pathways here. A lot of it has been demonstrated. A lot of this is commercial, a lot of it is not commercial and will require

investments by private industry to make these processes go forward. So cost here is an important consideration.

This analysis is only looking at what the sort of emission footprints are. Cost is not necessarily included.

Just to give you a couple of examples, again, of how this works. Let's look at the case of gasoline coming into California. The marginal case is the case of where we are importing oil into California. I'm sorry, the marginal case is where oil is produced overseas. It is refined overseas and then we are importing product, refined product into California. That then gets mixed in with our existing system. So you would take CARBOB, for example, put it in with the ethanol, to give you RFG. That then would be transported to the local fueling station.

If you look at it -- Say one example, biomass. You're growing, you're harvesting the corn. All those activities. You're fertilizing. All those things have to be counted. You make the corn, you take it to a dry mill processing plant. You denature it by putting a little bit of gasoline into it. You put it into a rail car,

bring it to California, it's coming from the Midwest. That denatured ethanol then is put in at the terminals.

If it was an E85 option then you would be mixing that with CARBOB from the refinery to put the E85 into the local distribution network.

So what was the scope here? We did upwards of 94 pathways. There were two vehicle applications. Really a little bit more than two because we also did some non-road on the electric side. But the two primary vehicle applications were light duty vehicles and heavy duty vehicles. There were four analysis years that we looked at, 2012, 2017, 2022 and 2030. There were two vehicle fleets, so to speak. There were existing vehicles and there were new vehicles rolling in.

And for all that we were looking at criteria pollutants, well-to-tank energy, well-to-wheels, GHG, greenhouse gas emissions, toxics and water pollution.

Just to give you a little more detail there were like ten conventional fuel pathways looking at California reformulated gasoline, California ultra-low-sulfur diesel. I think there were like 22 blend pathways considering things

like E10. There was probably even E15 in there. Biodiesel B20, Fischer-Tropsch diesel at 30 percent blend with California ultra-low-sulfur diesel. fuel, E-Diesel, renewable diesel also on a 30 percent blend.

And then there was a number of neat fuel pathways and the alternative fuels included compressed natural gas, ethanol, electricity, renewable diesel, liquified natural gas - LNG, methanol, hydrogen, LPG or propane, DME, biodiesel and then Fischer-Tropsch itself.

So applications again. Light duty, heavy duty, non-road. Tried to be pretty all comprehensive.

Most of all of these analyses are shown in the back tables of this report that's sitting out in the front. I think we have tried to be as transparent as we possibly could with all the assumptions and the various results that resulted from the analysis.

So let me just give you a couple of example results, okay. I can't go through the whole report for you but I wanted to just look at a slice of some of the results. And most people are familiar with light duty so I chose light

duty. And then I'm going to give you some observations/conclusions, not only on the light duty but the results also apply across all sectors.

For the light duty in particular you have to consider what the fuel economy is, I've already discussed that. And we do make some assumptions regarding the fuel economy of today's existing vehicles as well as the vehicles in the future. And in particular one major assumption is that the Pavley regulations will be in place, which will require lower greenhouse gas emissions from these vehicles but it will also improve the fuel economy of many of the gasoline vehicles.

And then there's alternative fuels. But in general the alternative fuels like CNG, LPG, E85, any of the ethanol options, all have about the same fuel economy as you would see with a conventional gasoline ICE.

Where you get into improved fuel economy is when you get into the electric drive technologies like a plug-in hybrid electric vehicle or the hydrogen vehicles, and of course, the battery vehicle itself is much more efficient than the ICEs.

So there's a couple of results you could look at. I'm going to show you what energy sort of looks at, looks like for, again, light duty. And starting at the bottom with the reformulated RFG at 5.7 and it's meeting, you know, current California standards. It's an internal combustion engine vehicle.

And you can see what we've done here is account for not only the total well-to-energy -- well-to-wheel energy in terms of millijoule per mile but we have also broken it down in terms of how much petroleum is used through that energy cycle, plus how much natural gas is used plus how much non-fossil fuel is used.

And you can compare that to say an electricity option, which in California with the current mix is mostly natural gas. Much higher efficiency vehicle so you would expect to see less energy needed to propel that vehicle. Also the fact that you are not using a lot of petroleum so this is one strategy that would displace petroleum, as you will see later.

You could look at some of the biofuels too. Let's take the example of an ethanol, California using poplar trees. What I would call

quote/unquote a cellulosic pathway. Here you can see that in this case a lot of the energy here being used is actually coming from the biomass. There is still some petroleum that's required. And there's actually a credit because you're co-generating back into the grid with some of these processes.

Now that said there is a -- This is accounting for -- This particular chart here shows the total energy including the amount of energy that's in the fuel or in the tank, so to speak, so there is a correction here that puts this line down in this part here. It is shown in the text of your other report but it is not shown here.

The other thing that we did was look at it not only in 2012 but in 2022. And the big difference here is the fact that the cars are going to be more efficient in the out years but the trends are about the same.

COMMISSIONER BOYD: Mike, I don't know if this is the best way to bring this up but when you talk about poplar as a surrogate I guess or growing cellulosic feed stock it reminds me, as I indicated in the introduction, that we need to take into account, we the Commission in working

with our partners at ARB need to nest into this whole plan the biofuels component as well.

And one of the major thrusts of our biofuels recommendations in this state includes using California's significant cellulosic waste stream, which is comprised of -- and I'll go in reverse order, urban green and wood waste, agricultural field and food processing waste, and the one that really goes at the top of the list, forest biomass waste, before we burn all the forests down. But I'm afraid we've got a head start on the latter suddenly here.

We have not really done much in the way of well-to-tank analysis of that component and that is something, that is another contributing issue to those, some of the folks who asked that we take more time in preparing our plan. Are we going to be able to contribute some of that type of analysis to our debate over the next couple of months?

MR. JACKSON: I believe that's possible, Commissioner Boyd, and in fact I think some of it is in here already. Like the forest waste residue option, which isn't shown here, is in the analysis already.

COMMISSIONER BOYD: I am now reminded of that from reading it quite some time ago. I think we'll be raising that a high priority all of a sudden here.

MR. JACKSON: But the municipal waste streams, the other streams of possible feed stocks here need to be looked at and considered.

COMMISSIONER BOYD: Well the municipal waste stream is the subject of one of the bio-refinery projects that both the US Department of Energy and this Commission have dedicated grant funds to and it is something I think we need to pay attention to as well. We will be seeing a plant rising at a municipal waste facility in Southern California dedicated to the use of green waste, quite frankly. To turn it into ethanol in the not-too-distant future.

MR. JACKSON: Let me go to greenhouse gas emissions now. And here I'm showing the total impact in terms of weighted greenhouse gas emissions, GHGs. And what we mean by that is CO2 equivalents. That's CO2 plus N2O plus CH4 all sort of back-equated to the CO2 equivalent units.

I am also showing both the well, the tank-to-wheel part of this. So if some fuels, for

example, do not generate any GHG from a tank-to-wheel basis -- Hydrogen is a good example of that, there is no carbon in the fuel. Therefore when you burn carbon (sic) in the fuel cell vehicle you are not going to get CO2.

And also I'm showing the well-to-tank, that is the upstream part of the process. And I'm showing this for 2012 and 2022. And you'll notice there is not too much difference between 2012 and 2022. Again it has to do with the improved efficiency of the vehicles as they are required to meet Pavley regulations on a CO2 basis.

So at the bottom you can see that for a standard car in 2012, that is standard being reformulated gasoline, an ICE vehicle, you're just over 400 grams per mile of GHGs emitted. Of that about, it looks we're on maybe 18 percent or so would be from the upstream part whereas the rest comes from the vehicle in the blue bar.

But if you go to something like, let's pick Brazilian sugar cane for example, you can see that there is a net benefit from the upstream part because you're basically recycling the CO2 through photosynthesis. I'll explain some of the caveats of that in a minute.

But the net here then, you didn't really pick anything up on the vehicle side. The vehicle bar, the blue bar, is about the same as the blue bar on the RFG side, but you did pick something up relative to the upstream benefits and therefore your net is 140 compared to something like 400. If that is true that's a huge benefit in a biofuels way of going.

If you go to something like electricity. Again, natural gas generated. Meeting our RPS requirement here in California. Charging at night. You can see that you can get very low GHG emissions also. Also another strategy.

And similarly PHEVs, the top bar there. Not quite as good because you're going to be burning some gasoline but the more electricity you use in that vehicle the better off it would be. So it kind of gives you an idea that there are strategies here. Not only from a vehicle point of view but from a fuel point of view, that could be implemented here to give you not only efficiency improvements or improvements in terms of the vehicle itself but also from the fuel.

If you look at criteria pollutants. And I know these are busy charts. What I'm showing

here is NOx, VOC, CO and particulate matter. And the particulate matter is times ten so it will all sort of compare.

But in general if you look at, again through all these various options, you're really not seeing much difference in the bars here. So NOx doesn't change too much, VOCs. There are some like LPG where the current practices to vent the LPG when you are fueling the vehicle, that's something that could be fixed. There is technology available to do that, it's just not done here in California. But if you introduced a technology like that you would do it in California. That's an example of a barrier that technology could easily fix.

But in general there is really not much difference between any of these fuels. We don't see any show-stoppers here. It's not something like we've got a huge problem -- We solved one problem but we've got a huge problem showing up anywhere else.

And in general what you see is the -- In this case there is a little difference between the 2012 and the 2022 years and all of that has to do with deterioration of the newer cars in 2012. In

2012 the way these impact runs were done, they're pretty much all new vehicles in 2012, they're only two years old. But in 2022 the vehicles are now 20 years old. So be a little bit careful in looking at those results because it depends on how the impact runs are actually done.

Okay, I wanted to just give some observations on the GHG emissions now that apply to the total results and not just to these light duty results. As you can see in the light duty side the GHG emissions depend on both the carbon content in the fuel, that's important, and the process that you have to do in terms of making that fuel. In all cases except for hydrogen and electricity the vehicle GHG emissions dominate the well-to-wheel emissions. Not a surprise.

The GHG emissions from alternative fuels in off-road equipment generally agree with what kind of impacts we see on the on-road. So there's not huge surprises there when we go to off-road equipment. And by non-road or off-road equipment I'm talking about things like truck stop electrification or I'm talking about e-forklifts. So those kind of applications.

There's a wide range of emission factors

for various pathways and in general you get greater GHG emission reductions when you have the combination of both higher efficiency and low carbon footprints on producing that fuel.

Electric generation mix based on natural gas combined cycle power plants combined with the California renewable power RPS standard or constraint is an appropriate mix, we believe, for doing the calculations. And it not only benefits those technologies that directly use electricity but those that would use electricity in the processing of the fuel.

And then finally GHG emissions from biofuels production and use depend upon a lot of factors and you need to be careful about things. And I'll talk about this in a minute, land use conversion for example, but also allocation of the byproducts. That's important. And the level and carbon intensity of the process energy inputs. For example, using coal to produce corn-based ethanol is probably not a very good GHG strategy.

And I said this already, most pathways result in comparable emissions relative to criteria and toxics. These emissions tend to be dominated by the upstream events that are

occurring in California. That is the marine and rail transportation, which tend to be the dirtiest these days in California but are cleaning up as new non-road standards are implemented and new fuel standards are adopted by ARB.

Diesel PM is the primary contributor to the weighted toxics emissions. Although I didn't show you those you'll have to trust me on this, it's in the report. So fuels that are delivered by ship or rail have these highest toxic emissions impact in the near-term years, which will reduce in the out years due to cleaner technology, cleaner fuels.

In general criteria pollutant emissions for the electric transportation are comparable to or lower than those from conventional fuels. And those lower emission levels result from efficient new power plants, but also the fact that you could control the emissions at a centralized location. And I think that is an important point that tends to escape us at times. But centrally producing the emissions and petroleum emissions at a centralized facility is probably a lot easier than trying to do it on every vehicle that we have. So keep that in mind.

Emissions of NOx, VOC and in some cases PM would need to be offset. Especially if you're doing things in terms of production facilities in California. And we have accounted for those offsets in this analysis.

And then finally, fugitive losses and fuel spills are a fairly large source of the ROG, benzene and 103 butadiene emissions associated with gasoline as well as PAHs from diesel. These emissions from the fuel transport delivery are often largely eliminated when you go to some of the alternative fuels like natural gas.

Okay, some caveats. Especially on the biofuel side, land conversion effects could be a very substantial effect, possibly negating or substantially lowering any of the benefits we're showing here today. And going from probably a least effect to a huge effect is the existing crop lands.

Although if you have to expand to other areas where you're actually taking up grasslands, that is going to have an effect. If you are going to deforest that has a huge effect. If you are going to go to wetlands, which have a substantial peat content in them that store a lot of carbon

that will have another huge effect.

There is a lot of work that is being done on this and we have to -- any future assessments of GHGs and any future Full Fuel Cycle Analysis needs to incorporate these kind of analyses.

COMMISSIONER BOYD: Mike, sorry to interrupt you again. But I'm just going to make the point I made a little bit earlier and just reinforce it.

When we had our joint workshop with the ARB in this room and Professor Sperling made his presentation about the work the university is doing on the low-carbon fuel standard and their analyses utilizing this Full Fuel Cycle Analysis I asked Professor Sperling the question that since there had been so much discussion about needing to take into account the consequences of biofuels if you get into land conversions, land use and what have you, I asked him if therefore the idea of using our waste stream as the input to, our cellulosic waste stream as the input to fuel-making would significantly reduce, will eliminate the land conversion concern if can assure people that taking material out of the forest isn't the

first step towards logging old growth or something like that. If we put up all the protective barriers for our national parks, monuments, forests, et cetera, et cetera, but still get all that material out in concert with all the ag waste. I would presume the Full Fuel Cycle Analysis would show an extremely positive benefit in that it doesn't touch this arena at all.

MR. JACKSON: That's correct, Commissioner Boyd. This is an issue of mostly the commercial crops or crops that you would grow, energy crops so to speak, that you would grow compared to what is existing or what the land is currently being used for. Waste products tend to bypass this whole issue.

COMMISSIONER BOYD: I keep making this point because California is kind of unique in relation to other states and other nations in the massive size of this waste stream but it is not confined as to California. But in any event, in concert with this whole effort the bioenergy working group keeps trying to push this point up to the top of the state's agenda. Thanks.

MR. JACKSON: The second point here is that I want to make sure everybody understands

that these kind of results and the pathways that were selected -- the assumptions assumed in the pathways is really an average sort of pathway that we've selected here. And you really, if you're going to do more than just policy. If you were going to credit a pathway you would have to specifically look at that pathway and exactly where the energy is going. So that's just another caveat.

Our recommendation here is that we think that this methodology is very powerful. It gives you some insights into what's happening from the perspective of various feed stocks and how the feed stocks are processed and in how they're used.

So we would recommend that you continue to improve this methodology, not only from revising and updating the inputs but also continuing to monitor the land conversion type studies and see how those come into effect.

And then finally I would say we would recommend using this methodology to provide guidance on lowering carbon emissions from the transportation sector. And I say that as a system from a fuel and vehicle perspective.

Let me just --

COMMISSIONER BOYD: Mike, another interruption, excuse me. On that point you just made, to continue to improve the methodology. I am reminded, and there's probably people in this audience who were here and maybe several who weren't. But at our last Commission meeting this Commission approved a fairly healthy amount of money for a contract to continue to improve the GREET California model, recognizing that as a result of the work of the ARB staff and our staff.

And in the context of the discussions about GREET versus LEM versus other models it was necessary to move this issue on into the future. So we have made that commitment as a Commission here. Hopefully others can contribute to this effort.

MR. JACKSON: Okay, what I wanted to do in the last sort of closing slides here is kind of give you an idea of how you would use this methodology. You might think about some of the options.

And just to put it in perspective what I have shown here is California fuel demand. And you guys, the Commission is really going to look at this in more detail relative to the upcoming

IEPR. So I have -- I think these numbers actually came out of the 2005 IEPR. But it shows diesel demand and gasoline demand. And this is on-road only. We need to be thinking about off-road applications here too relative to alternative fuels but this is on-road only.

And I put a couple of targets on here. The 20 percent reduction in 2020 of this particular demand would be about four billion gallons. In 2030 you would be, about six billion gallons would be what you would be trying to achieve in terms of the AB 1007 goals, anyway. So just sort of keep the four and the six in mind.

Then what I am showing here is for the light duty sector here's some blend strategies. And I am showing two things on the blend strategies. There are different blend strategies shown on the X-axis and this is percent reduction from the baseline, which would be an RFG baseline. And this is in 2020.

So I am showing the GHG reductions relative to that well-to-wheel greenhouse gas emission reduction percentage and I am also showing the amount of petroleum displaced using these strategies. So let's pick an example.

Let's pick the example of ethanol in an E10 blend. So ten percent ethanol blended in with gasoline would provide from 5.7, the difference between 5.7 blend. It would provide about a six percent GHG benefit in about a say three percent petroleum displacement benefit. That would equal to somewhere on the order of 1.4 billion gallons displacement. And in terms of GHG reductions it's comparable to about six million metric tons. Just from that strategy.

If you go to a cellulosic option you might, you might do much better. Or if you increase the amount of ethanol into the fuel you would do much better.

The point here is that the strategies, different strategies give you different answers relative to GHG and petroleum dependency. On the far right is an example that gets you a lot of petroleum independence but goes backwards relative to greenhouse gas emissions. All right. So you have to keep in mind, you know, what goals you're going after.

If you look at it from the perspective -- now this one gets a little more because I've included more options in here. This is not a

blend now, this is new vehicles entering the marketplace. And this is showing compressed natural to ethanol, say at a 30 percent blend, to an E85 blend to hydrogen vehicles, either from biomass, hydrogen derived from biomass or from steam-reforming natural gas.

Again you sort of see the same thing. You can have a strategy. Natural gas does a great job at displacing petroleum but won't have nearly as high greenhouse gas emission reductions as some of these other options would be. Now that said, maybe natural gas doesn't work as good in the light duty sector but worked really good in the heavy duty sector. You've got to be able to put all this stuff together but it kind of gives you a good idea of what you could achieve.

In the case of let's say a 2050 GHG impact. You could have plug-in hybrids on the other of 20 million metric tons reduction in terms of GHG. An E30 might give you somewhere between 10 and 40 metric tons. These get to be pretty big numbers if you think about what the goal is for partitioning the GHG reductions in the state. I think AB 32 has something like a 75 metric tons goal reduction. So you can see these are fairly,

get to be fairly large numbers.

Now, does it take a lot to get there? Absolutely. We're talking about, you know, in an E85 case you might be talking, you know, a huge number of vehicles. All your vehicles might have to be operating on E85 in order to achieve these kind of, these kind of goals.

But this is the type of work that is now going on, that has gone on relative to the story line development and looking at what's possible. And then you look back and say, well what's the cost of getting there? That's the next part.

Let me just say and put it in context, in one other light. And that is, I sort of ask the question here. What is required of these different fuels to meet the current low-carbon fuel standard? Well, the proposed low-carbon fuel standard requiring at least ten percent reduction in carbon and gasoline and diesel fuels by 2020.

So what this is showing you is how much fuel consumption is needed for various options and what the penetration would have to be in the marketplace to do this. So let's take, for example, diesel. You could meet the low-carbon fuel standard using diesel in light duty vehicles

at an implementation rate of about 52 percent. You would be displacing some six billion gallons of gasoline. How much petroleum would you displace? Zero.

You could go to an option like a plug-in electric vehicle. Sort of architecture assuming like 20 miles all-electric or some sort of mix. You could achieve the standard in this example with 38 percent of the light duty fleet. And your displacement here, although not shown, it is going to be a lot bigger than just the displacement of the fuel because you have efficiency improvements.

If I jump all the way over to hydrogen, for example, again it takes less, probably even less, not surprising, because the fuel has much less carbon grade to it. It takes much less to get it into the marketplace and it takes a lot less fuel. But it is going to displace, because of the efficiency improvement of the vehicle itself, it is going to displace some six billion gallons.

Okay. I'm going to just conclude with this last slide here. Hopefully I have been able to demonstrate that the Full Fuel Cycle Analysis is a useful tool to judge these various

alternative strategies for reducing GHG as well as petroleum displacement in the transportation sector. There's a couple of things that sort of stand out to you when you do this and one is improved efficiency is very important, not only from a production point of view but distribution as well as end-use.

There's a variety of alternative fuel pathways that reduce both GHG emissions and petroleum consumption. My personal feeling is you need to focus on those pathways that provide both benefits.

Electricity, depending on the generation mix provides the lowest overall impact on GHG criteria, toxic emissions and water pollution. Now there's technology issues in terms of getting some of that technology in the marketplace but we are identifying those hurdles, we are identifying those barriers, and we're looking at ways to overcome them.

And when I say electricity here I should really say electric drive. That's probably more accurate.

Biofuels can be very effective at recycling carbon and providing lower GHG

emissions. But the caveats, right. Make sure that we understand what land conversion is, make sure we understand harvesting, make sure we understand collection, production, co-products. Those things are important. Fertilizing the crop. All that affects the potential benefit of GHG from biofuels.

And then finally, alternative fuel blends with existing fuels have ben the most successful way that we have gotten alternative fuels into the marketplace and could continue to be an affective strategy in terms of displacing as well as reducing GHG emissions.

Thank you for your attention.

CHAIRPERSON PFANNENSTIEL: Thank you, Mike. Questions from Commissioners?

COMMISSIONER BOYD: Perhaps more in the form of a couple of comments following on with Mike's presentation. I am kind of gratified to see that the work that Commissioner Geesman and I did when we were the Transportation Committee and the IEPR Committee in pushing forward the plug-in hybrid electric vehicle, which this Commission ultimately ratified, has proven to be perhaps a wise strategy with regard to California's future

more than a wrong thing to pursue.

And I guess a reaction I have to your presentation, Mike, and from our workshop before is, I guess when we did the scoping order for this effort, and that Transportation Committee was Chairman Pfannenstiel and I. Now it's Commissioner Byron and I. I hang in there but my partners keep changing. In any event, we've trained them all.

In any event, the scoping order that we did quite some time ago we were thinking of the fact and saying pretty clearly, there are no silver bullets. And we've striven very mightily to not, you know, not point us in the direction of a single strategy in order to have a level playing field and let the market and competition work.

But during the course of our discussions I have heard the term silver buckshot multiple times and I am beginning to believe that perhaps when we get done with this plan we will have to point people in certain directions over a certain time of you can do this now, and then you can maybe do this in the mid-term and you can do something different in the long-term. But we have two more months to digest that.

But having referenced the scoping order I would recommend everybody go back in their historical records and take a look at it because it was written at a time when the major thrust of the legislation and gubernatorial direction was to address fuel price volatility, transportation fuel price volatility, which was a product of supply versus demand.

And the recognition by policy makers in the executive and legislative branches finally that it truly was pure market that the supply of fuels just couldn't keep up with the demand and that's proven to be uncomfortably true for quite some time.

So the alternative fuel plan is going to have to recognize that commitment, the biofuels commitment and the low-carbon fuel commitment. So nesting all those together is going to be difficult. And all of us here, particularly our partners at the ARB -- And we're going to have to push that. And it is certainly exemplified by the presentation that you just made. So our work is still cut out for us.

And lastly I'm reminded historically of the work Commissioner Geesman and I did on AB 2076

with our friends at the Air Board, which kind of pointed out the need to reduce our dependance on petroleum, number one. The need to inject efficiency, efficient technologies.

And I believe we called for and probably still hang together on the idea of doubling CAFE in the United States, which debate is finally being added in the Congress, although they are not quite that courageous. And of course secondly, alternative fuels, and thirdly, land use transportation and what have you, i.e. VMT reduction, which this agency is addressing. The Chairman spent an entire day yesterday in this room on that subject in a workshop for the 2007 IEPR.

So all these things are coming together and it just points out the complexity of this issue. And it really points out to me the incredible importance that the Full Fuel Cycle Analysis has become in terms of us dealing with this issue. Which while it compounds all of our jobs up here and frustrates many of us it certainly fulfills the concern that a lot of us have had for a long, long time that you need to look at the entire, bloody system before you make

decisions on where you're going. And I think climate change has finally forced that upon us.

Anyway, that's more of a comment instead of a question but thanks for your work and your presentation.

CHAIRPERSON PFANNENSTIEL: Mike, I just wanted to say that I thought it was really interesting work as I plowed through the various graphs and tried to make sure I understood what was there and what it was telling me. So I really appreciate your presentation this morning. I think it crystallized a lot of that.

In going through the various metrics of analyses that you ended up doing did you find anything surprising? I went through and I'm learning a lot and there was a lot that didn't seem obvious to me until I started peeling it back and tried to understand it. Any a-has in there? Anything that struck you as something that was a new finding to this study? Or is it largely confirming and documenting what we would have expected to find?

MR. JACKSON: That's somewhat of a difficult question for me because I have been doing this now for probably 20 years so I'm not

sure anything is new.

CHAIRPERSON PFANNENSTIEL: Oh, come on.

MR. JACKSON: No, I think it is more of the latter. It really confirms our thoughts about how, you know, various combinations of fuels and energy systems come together. But really to me the important part is looking at, sort of dividing it up between the upstream parts and what happens on the upstream and what happens on the downstream parts.

And you can see with some of these technologies that the downstream, the vehicle end-use, you know, you can have some very efficient, you can have extremely low emissions or no emissions of greenhouse gas emissions but, you know, it all gets generated in the upstream. It just reemphasizes to me the system part of this. And I think Commissioner Boyd said this. In the transportation sector it's a fuel vehicle system.

And, you know, we have tended in the past for good reasons to look at them separately. I think as we move forward in the future we can't look at them separately anymore. This needs to be something that we really pay attention to. And hopefully policies will pay attention to it so

that we consider it as a system and not necessarily divided. That's sort of one of my major take-aways.

CHAIRPERSON PFANNENSTIEL: Thank you. One of my take-aways, I have to say, is that there is no obvious path to resolving the simultaneous equations of lower GHG and lower petroleum consumption and lower pollutants. We have a lot of choices yet to make.

MR. JACKSON: That's a very good point. There's lots of choices and there's lots of stages of development of where the technologies are. So it is going to require, you know, some finesse in terms of encouraging the right response out of industry.

CHAIRPERSON PFANNENSTIEL: Thank you. Other questions? Yes, Commissioner Geesman and then Commissioner Byron.

COMMISSIONER GEESMAN: Mike, I was struck on your last slide, and also I think one of the comments that you made when you were discussing I think natural gas. Your belief that it is important that we look for pathways with dual benefits. And I wonder if you would expand on your thinking there.

It would seem to me that it is at least hypothetically possible that we could assemble a suite of different pathways that served single benefits and in combination accomplish the same thing. That might carry with it too much complexity. But if you could explain your logic.

MR. JACKSON: I was somewhat simplistic in showing you the examples I showed you. It gets more complicated when you try to bring it together in terms of, you know, sort of the silver bullets acting in a strategy.

My comment on natural gas was one where it's a near-term technology, for example, that works quite well in some of the heavy duty applications. Transit busses is one of those. Where you're not going to be able to -- the best you're going to be able to do is maybe a 20 to 30 percent benefit in GHG but you can get a tremendous benefit in terms of reducing the petroleum consumption.

So I think you're right, Commissioner Geesman. This becomes -- When you start putting together the pieces you're going to have to pay attention. There can't be just one rule, so to speak. You're going to have to pay attention to

what works, in what time frame does it work, and how do you put those pieces together. Well, I'll leave it at that.

COMMISSIONER GEESMAN: Thank you.

CHAIRPERSON PFANNENSTIEL: Commissioner Byron.

COMMISSIONER BYRON: Thank you. Mr. Jackson, I think this is extraordinarily good work. I think it is going to be helpful for policy makers. I wanted to get a sense from you, and perhaps Commissioner Boyd, how unique is this work and how unique is it to California or applicable to outside the state?

MR. JACKSON: Uniqueness. A lot of people, including European countries for example, the European Union for example, has taken on the goal of looking at what are the impacts of various fuels and fuel combinations relative to a Full Fuel Cycle Analysis. So the analysis uniqueness, I don't think it is all that unique. It has been done, it has been for a number of years.

To be unique is how you use it as a way of complying with California future regulations here. In putting together all the things that California wants to do in terms of reduced

greenhouse gas emissions. That is not being done anywhere, to my knowledge. Commissioner Boyd, do you want to add to this?

COMMISSIONER BOYD: No, I would agree with Mike. What has been interesting to me, as he indicated, that peopled talked about this for a long, long time. People have talked about the need to do something like this and models have been developed for a long, long time and lightly applied.

I think I used the crude analogy early on that we realized when we started this job that we were taking maybe a deeper dive into the subject because we had to really start getting practical about applications. And then when the low-carbon fuel standard arrived on the scene it became painfully evident that that work was heavily dependant on a good, full fuel cycle analysis and we tried to dive a little deeper.

But as you do that you look around to the rest of the world. And as Mike said, application of the academic theory hasn't been too extensive. This is a fairly in-depth application of heretofore academic theory and I think a lot of us have realized that while this is really good

work a lot more needs to be done as tough decisions are made.

At least the Air Board has got 18 months, more or less to deal with their task of a low-carbon fuel standard. We are blessed or cursed with the responsibility to come up with an alternative fuels plan by the end of this process, which is a couple of months.

And Mike's earlier comments in response to Commissioner Geesman made me think of when I analogized silver buckshot. We talk about what fuels would be good to use based on their footprint, environmental footprint.

But actually if you get them into use you start thinking about, where is there and can there be adequate supply of fuel X, Y and Z in the various time frames. Is there -- and that includes therefore, is there infrastructure to deliver that fuel to the consuming public. And then, is there vehicle technology in existence and/or in adequate numbers out there such that it can utilize the fuels that we're talking about.

I guess the marvelous example of how this isn't simple and doesn't work is the long-held recognition that the flexible fuel vehicle is

a wonderful thing. It can consume E85, which would be good for us. And one of my pet peeves, after the auto industry for years has gotten CAFE credits for these vehicles, when it comes to California there's zip infrastructure. A lot of talk about needing to do it but it's not happening.

So we have to make recommendations that take into account what's feasible to get done. Whereas is there going to be the industrial community and the business community willing to provide infrastructure and provide the fuels and see a business case for them, vis-…-vis, you know, what it is we're trying to accomplish. That's no -- That's a tall order as we are beginning to see.

COMMISSIONER BYRON: But it's a good tool. Thank you for the report.

MR. JACKSON: Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you, Mike.

I think now unless there are further questions from the Commissioners we will go to public comments. I have here three cards and I understand there is somebody on the line besides. We'll start with people in the room. Richard

Epplet.

MR. EPPLET: Good morning. I am the sole proprietor from a company called Quality Transport Services. I have been in the taxi business, the airport shuttle business. Small-type vehicles. And there is a lot of concern amongst us in regard to these new fuels that are coming up.

Commissioner Boyd, you kind of brought one of these up and that is, what fuels can we use in our vehicles that they're not going to break down on the highway with a load of passengers or whatever. So that is something that has to be considered and studied.

Also availability. I attended a bioenergy meeting in Napa here a month or two ago and I met with a fellow from Frito-Lay. And he says, as far as availability they are very concerned about it. They'll go to it but they've got 1,000 vehicles. And where are they going to get it, you know, if they are on the road? You need a place for them to stop.

For that reason, those problems that I came up with in my analysis, I decided to set up a company called Echo Fuel and 100 percent synthetic

lubricants. What I am wanting to do is set up the retail centers, particularly in the Northern California area for all the different fuels that are available. Of course I will be very careful as to which ones I offer.

On the 100 percent synthetic lubricants it's very low polluting. I can go 25,000 miles between oil changes. I can go 75,000 miles between transmission services. So that there will eliminate a lot of the pollution that goes on because of fuels and oils.

And also we have a fuel additive that you can put in the cars right now. It's called Performance Improver. It will go 4,000 miles and will give you practically zero emissions from the gasoline. At most you would realize -- I saw a smog report from one of my colleagues. They had a 450,000 mile vehicle, a vehicle with 450,000 miles on it. It showed .05 COs from it. Your smog test, if you go over .64 you are a polluter.

So these are some of the things that I'm looking at. I'm kind of seeking some seed money from either a grant or from investors in order to get the Echo Fuel situation going. Because I checked with BP and they can set me up with a gas

station but they want a million bucks.

That's basically all I had in mind at this point.

CHAIRPERSON PFANNENSTIEL: Thank you very much.

Joe Sparano.

MR. SPARANO: Good morning. For the record my name is Joe Sparano. I am president of the Western States Petroleum Association, or WSPA. WSPA represents 26 companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and alternative and renewable fuel supplies.

WSPA appreciates all the work that CEC and TIAX have done and put into developing the Full Fuel Cycle Analysis tool. However, we also believe that TIAX's Fuel Cycle Analysis or FCA illustrates the uncertainty that exists in this fundamental and necessary tool for measuring carbon intensities of various fuels.

Most experts agree that there is no widely accepted FCA method for measuring all global warming impacts of transportation fuels. The FCA does set a good foundation. While WSPA and our contractor, ERM, provided input to TIAX

we're disappointed TIAX only made minor changes to their analysis.

As noted in our letter of June 19 to the docket, we believe the FCA needs more work to become a valid analysis tool for the difficult policy decision making that must occur under the low-carbon fuel standard or LCFS. The majority of recommended WSPA and ERM revisions were not addressed in our view in any substantive way. A few assumptions were changed and a small-scale sensitivity analysis was done. That represented only five or six parameters that were run out of about 100 in the model. We believe the sensitivity analysis should be more robust.

CEC staff responded that they felt the select elements in their sensitivity analysis only would have made small percentage changes to the results. But adding all those small changes together may create a significant response.

Most of WSPA's and ERM's comments were also consolidated with other third-party reviewers. A generic response was given but this is not sufficient in our view, given the complexity and importance of these issues we're dealing with. WSPA requests that all third-party

comments be included in their entirety as an appendix to the report and that the TIAX/CEC responses should be specific to the comments that were provided.

The FCA is certainly a critical part of many, current California climate change activities and that includes perhaps first and foremost the LCFS. So we'd like to feel confident that the model is accurately reflecting how different transportation fuels will impact the state, including their reliability and affordability for consumers.

Obviously the model is only as good as its inputs. If one element is inaccurate or missing, as in the case of land use impacts, which Mike did address during his presentation, it can significantly change the results. Also ERM and Argonne Laboratories recommended use of a substitution method rather than the allocation method TIAX used to determine impacts of co-products from ethanol production. Despite our input TIAX did not make changes to the final report to address this different approach.

Uncertainties exist. So WSPA recommends biennial milestones be scheduled over the

implementation period for the LCFS. This should assist in ongoing improvements to the FCA methodology.

We understand that development of the LCFS is now under the purview of the Air Resources Board. However, the CEC has the expertise needed to look at the trends in the marketplace and identify any problems that may arise from transportation fuel policies.

WSPA requests that when you provide the FCA to CARB that the CEC communicate in the transmittal that the rules should contain regularly scheduled milestones and meaningful review to ensure that the following issues are examined and measured. The availability of reliable and affordable transportation fuels, the cost and cost-effectiveness of the rule, and the technological and infrastructure progress needed to achieve the goals in the contemplated time frames.

We recommend the CEC review every two years, consistent with your excellent updates of the Integrated Energy Policy Report, or IEPR. Those look at among other things transportation fuel marketplace trends.

There is an additional concept that we believe needs consideration and further development. Uncertainties exist, as I have said, and the modeling tools available to conduct the Full Fuel Cycle Analysis of greenhouse gas emissions from various transportation fuel options that will be compared against gasoline and diesel fuel.

WSPA suggests forming a public/private collaborative with CARB as a host to continue improvement of the modeling tools needed to make informed decisions. The collaborative would assemble a broad-based, representative and technically competent team of individuals to provide input into the upcoming state fuels policy actions and into development of an accepted and accurate FCA.

We envision the CEC and the UC professors who wrote Parts 1 and 2 of the LCFS technical and policy analysis using the CEC's FCA as the basis would be partners in the collaborative along with other interested stakeholders. There is also interest federally and internationally for improving these essential tools. We have two specific efforts in mind for

this collaborative. The two are the Full Fuel Cycle Analysis and what is referred to as a Dynamic Energy Simulation Model or DynaSim.

WSPA would be pleased to discuss our concepts for a collaborative approach with the Commission and the staff.

In the meantime if the TIAX FCA work gets adopted today and forwarded to CARB we ask you include a written acknowledgement that the maturity of the science is uncertain and needs to be improved to support California's future policy decisions. We also encourage you to highlight the collaborative and milestone concepts in the transmittal letter.

The CEC might offer to the collaborative the additional TIAX work that Commissioner Boyd mentioned earlier that you recently commissioned to make improvements to the model. You might also include the CEC program manager recently hired to oversee the DynaSim model development as another contribution to this collaborative process.

It is our hope that we can work together on vastly improving the situation before major policy decisions have to be made. Thank you for giving me an opportunity to share our input and

would be happy to take your questions.

CHAIRPERSON PFANNENSTIEL: Commissioner Geesman.

COMMISSIONER GEESMAN: Joe, this milestones concept. Is the low-carbon fuel standard envisioned as one that will have interim requirements before it hits the ten percent target in 2020?

MR. SPARANO: The concept here, Commissioner Geesman, is that we are concerned, and I think others as well, not just the petroleum industry, that this is such an enormous undertaking. It involves a degree of complexity perhaps beyond anything we have all done before, that there ought to be some very specific periods during which we examine the impact of what we are doing on the marketplace, on fuel supply. It won't do any of us any good if we reduce greenhouse gases and don't have any fuel to run whatever transportation --

COMMISSIONER GEESMAN: I don't think I disagree with any of that.

MR. SPARANO: So we're looking at something shorter. Dan Sperling was here and we talked about this a couple of weeks ago when I was

at the podium suggesting that five years was a good, interim period for examining how things are going. We just think it should be shorter.

COMMISSIONER GEESMAN: But should there be some target --

MR. SPARANO: Like off-ramps so we should delay it? No.

COMMISSIONER GEESMAN: Should there be some target short of ten percent earlier than --

MR. SPARANO: I don't know, we should talk about. In a fair, honest answer, I don't know. We're concerned that we shouldn't backslide. We shouldn't go backwards or have some off-ramp that diverts us from the ultimate goal. But rather we ought to have some thoughtful contemplation of how we're getting there and what other impacts it's having.

COMMISSIONER GEESMAN: I don't think I disagree with that but I think there's a certain symmetry to your argument that ought to be applied on really both sides of the equation.

MR. SPARANO: Okay.

CHAIRPERSON PFANNENSTIEL: Thank you, Joe.

MR. SPARANO: Thank you.

COMMISSIONER BOYD: Joe, if I might. I just wanted to remind you of a couple of things. And you did make reference to IEPR and the question of that's a two year cycle.

So this agency is kind of automatically in looking at the three legs of the energies tools looks at electricity, natural gas and transportation fuels. So it provides a forum for discussion of what's new and what are the policy issues in the transportation fuel arena.

Another thing I would commend to you and to any in the audience who are interested in this subject, the staff has put a suggested Energy Commission resolution on the table in the foyer out there.

And I note in it that the staff is suggesting that we approve a resolution that says, among other things, that it acknowledges the need for ongoing updates of the full fuel cycle analysis and methodology to gather verifiable data and to improve elements, such as land use impacts, and directs the staff do to so in an open and transparent manner.

I think, coincidentally, that the staff is recommending to us the need for, as we in the

dialogue with Mike Jackson probably already said, to just continue looking at this subject area.

I don't know if that meets your need. But I just wanted to point it out as something that, obviously, the staff is recommending to this Commission that we acknowledge the need for.

MR. SPARANO: Okay, thank you.

CHAIRPERSON PFANNENSTIEL: Thank you.

Catherine Dunwoody.

MS. DUNWOODY: Good morning, thank you for the opportunity to comment this morning. My name is Catherine Dunwoody. I'm Executive Director of the California Fuel Cell Partnership.

And I'd like to start to say that I recognizes the very comprehensive and complex report that has taken a tremendous amount of effort of the CEC staff and consultants.

My comments primarily revolve around issues of consistency in the final report between the tables and chart and the text of the document.

And as I only had a few days to review the report and I didn't have access to the more detailed well-to-tank and tank-to-wheels documents, we were unable as a an organization to do a detailed review or to develop any kind of

consensus comments on, as an organization.

So I'd like you to consider my comments today as those of just an individual. I can provide these detailed comments to the staff but primarily again they have to do with consistency.

For example, conclusions on page 17 that hydrogen produced from natural gas using steam reforming provides a 45 percent reduction in greenhouse gas emissions compared to gasoline. But the tables and charts indicate approximately 55 percent reductions.

So just looking for those to be consistent. I think that if, with the attention of this report will get and the fact that most people won't go into the details of looking at the charts and the tables. They'll just look at the text.

Similarly there was an error between the text and the charts and tables with regards to hydrogen produced from electrolysis.

I'd also like to point out that that same conclusion regarding natural gas does not clarify that it applies to fuel-cell vehicles. And that's a very important distinction as internal combustion engine, hydrogen vehicles do

not provide the same kind of emission reduction benefits. So that should be clarified.

And then the other point that I've noticed as a change from the draft report without any explanation that I can understand is the well-to-wheel energy use for fuel-cell buses.

It's in the draft report showed a reduction in energy use. In this report it shows approximately the same amount of energy use. And, in fact, both of these seem inconsistent with recent results demonstrated by NREL for fuel-cell, hybrid buses.

And those are operated by Sun Line Transit and AC Transit where they're getting double the fuel economy of diesel buses.

So it's difficult for me to understand the different assumptions that went into this report but I think that needs some extra attention.

And finally, I'd just like to say that, well actually one other point, there's a conclusion on page 74, number 5 that talks about benefits of electric-drive vehicles.

And I think this is an excellent opportunity for the Commission to highlight the

similarities and common of all electric-drive vehicles whether they're powered by batteries or fuel cells. That all electric-drive technologies can significantly reduce energy use and emissions.

So I'd like to suggest that fuel-cell vehicles are also referenced in that conclusion.

So in conclusion I recognize the Herculean effort that the staff and the consultants have gone through and the fact that this project has significantly expanded in scope and attention given recent policy initiatives such as a low-carbon fuel standard.

But I'd like to suggest that the CEC needs to provide some more transparency regarding the proposals that are being considered in this process, better public notice and more opportunity to review the draft and proposed reports in advance of meetings and workshops.

So thank you very much for the opportunity to comment today.

CHAIRPERSON PFANNENSTIEL: Thank you for your comments. Let me just ask whether TIAX wants to respond now or would rather meet later and go through the specific comments.

MR. JACKSON: Let me just say a couple

of things. The analysis that was done was we made some in working with ARB and other stakeholders especially on the EERs or the efficiency numbers in there were changed quite late in the game.

Like I think it was probably early or mid, last week so it's not surprising to me there might be some inconsistencies on the text compared to the tables. But we believe that the tables and the charts are the right numbers at this point. And there may need to be some minor clean up on the text but --

CHAIRPERSON PFANNENSTIEL: Staff will go through and check out the changes.

MR. JACKSON: We apologize for that inconsistency.

CHAIRPERSON PFANNENSTIEL: Thank you for raising them.

MS. DUNWOODY: Thank you.

CHAIRPERSON PFANNENSTIEL: Jamie Knapp.

MS. KNAPP: Good morning Commissioners, Chairwoman Pfannenstiel. I'm Jamie Knapp. I work with the environmental community. I'm an independent consultant. And you have heard from a number of our individual groups and will today and over the last several months of this process.

Among the organizations that I'm working with, not necessarily representing specifically today, but are American Lung Association of California, Coalition for Clean Air, Center for Energy Efficiencies and Renewable Technologies, Friends of the Earth, Blue Water Network, Energy Independence Now, National Resources Defense Council and Union of Concerned Scientists.

You've heard from many of these groups in group letters along the way. I'd like to commend the staff for your hard work and your effort today. Acknowledge that it has been a very long and complex process. And we are pleased that you are extending the second part of this report getting more time for stakeholder input. That is something that we had asked for. And we think it is important.

I'd like to concur briefly with Ms. Dunwoody's comments regarding consistency. We have commented in similar fashion over the last few months.

I can't speak to the specifics that she identified but I know there have been similar kinds of errors that we have noted in other draft reports.

But mostly I'd like to talk a little bit about the recommended adoption statement. And I started first by looking at what was on the agenda today. The recommendations and noticed that you didn't have, did in fact have a more detailed resolution.

But I note that in recommending approval of the full fuel-cycle analysis methodology and the other recommendations there's no comment here, there's no recommendation that any of these that the state move forward, that as the state is moving forward that there is an acknowledgement that we cannot backslide on air quality or environmental impacts.

And so I'd like to suggest that in this last recommendation that the California Air Resources Board include regulations to establish a low-carbon fuel standard, goals to reduce petroleum by increasing alternative transportation fuels and increased state biofuels production.

And that any activities within those goals to increase the use of alternative fuels result preferably in improved air quality. And certainly not in any backsliding on air quality or other negative environmental impacts.

I just think that that, and it doesn't have to be exactly that language but I think we want to capture that sentiment in the resolution.

Thank you very much.

CHAIRPERSON PFANNENSTIEL: Thank you. Danielle Fugere.

MS. FUGERE: Good morning Commissioners. My name is Danielle Fugere. I'm the Regional Program Director for Friends of the Earth. And I would echo what Jamie just discussed.

And I also only looked at the agenda. So I'm glad to see, first of all to hear the discussion of land use impacts and the importance of getting that issue right in this analysis.

I'm so pleased to see that there's a recommendation that the staff conduct a program to do this.

And we'd like within that program to see time frames, milestones and then plans for funding additional studies where necessary so that you're not dependent just on what's out there in the community.

So we appreciate all of that. And we also echo the need to have adequate time to discuss the policy planning as it moves forward.

So we appreciate the delay in that, recognizing that that's something that needs to be done.

So we appreciate all of your work and also the fact that this is being done now in a comprehensive manner in bringing together the various policies and various agencies. So we support that as well and all of your efforts. So thank you.

CHAIRPERSON PFANNENSTIEL: Thank you for being here. Francisco Gutierrez.

MR. GUTIERREZ: Good morning Commissioner. My name is Francisco Gutierrez and I'm with Caltrans, Equipment Division.

And I just want to express the viewpoint that we highly encourage the Energy Commission to include the yellow grease in the biodiesel fuel feed stock.

We are especially interested in that probably because we use yellow grease biodiesel for our fuel. And we would like, if possible, to have that included in this particular report so that we would probably want to know how yellow grease measures up with the other grease.

And also we do not want to be in a position to justify and also to defend the impact,

the environmental impact, the greenhouse gas emission and also the energy use and so on.

So if it would be possible we would like that to be included in this report. Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you.

COMMISSIONER BOYD: Madame Chair I'd like ask the staff or Mr. Jackson if yellow grease, per se, isn't, in effect, in the analysis and in the arena of biodiesel.

MR. JACKSON: We certainly recognize that that was one of the options Commissioner Boyd. But it was not included in the current set or one of the pathways. It could be.

COMMISSIONER BOYD: Okay, we've had enough testimony on that subject in the past that I presume it'll be on the agenda for discussion of the biodiesel issue, particularly within the framework of the bioenergy, interagency, working group who had extensive discussion on that subject.

I won't get into details of, we got into sewer grease and everything else (laughter). But nonetheless I know it's on the table but a point well made.

CHAIRPERSON PFANNENSTIEL: Sorry, this

is either Joan Shears or John Shears.

MR. SHEARS: It's Jonathan.

CHAIRPERSON PFANNENSTIEL: It's John (laughter). I knew I gave detail (laughter).

MR. SHEARS: We're thankful for that. Good morning Commissioners. My name is John Shears. I'm the research coordinator with the Center for Energy Efficiency and Renewable Technologies.

I would just like to speak in support of the comments that Catherine Dunwoody and Jamie Knapp had made regarding these issues around some of the challenges the staff has had with their, as Catherine put it, Herculean effort to pull this lifecycle analysis report together given some of the hiccups stuff to deal with along the way.

And to see to the letter that a lot of the organizations that Jamie already listed. But we did submit a letter in support of seeking the extension for staff in order for them to have some breathing room.

Because I know that they and the consultants have had a challenging time trying to get all the work product done given the scope of the work and some of the policy and course

corrections that are sort of happened along the way.

So I just want to speak in support of the extension and also to remind the Commission that, of course, if they need any assistance in discussions with leadership regarding that issue that we're willing to help with.

As far as the resolution goes I just want to ask specifically that we, it's not clear to me when we're talking about land use impacts if we're just talking about potential climate foreseen related issues on land use impacts or if the intent in the use of the term in the resolution is referring to the challenge of trying to get our hands around sustainability.

So I just want to raise the issue that one of the big challenges going forward whether under the context of AB 1007 or the Low Carbon Fuel Standard, going forward for all of these low-carbon fuels is determining how to produce these in a sustainable manner.

And of course the first big issue, the first big challenge in that discussion is actually defining what we mean by sustainability let alone then helping provide guidance to staff in terms of

what work would need to be done in order for us to start crafting a system for collecting data, monitoring and regulating sustainable practices.

And there are also a lot of challenges in terms of what happens inside California versus what happens outside of California.

So I would just ask if we could get some, see some clarification on or I would ask that maybe we be a little more explicit in that we should be looking more broadly at sustainability when we're talking about wineries impacts. Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you. Dwight Stevenson.

MR. STEVENSON: Good morning Commissioners. My name is Dwight Stevenson. I'm with Tesoro Petroleum.

And I have some questions for TIAX if I could ask them. The issue of land use was that considered for corn ethanol for instance, was there a land use factor put in there for what that land could have been doing for carbon capture?

MR. JACKSON: GREET has the current version of GREET that we used has a small factor in there for land use. But it does not account

for things, for example, of taking expanding, vastly expanding corn to ethanol production by going to non-ag lands or non-crop lands right now.

That kind of switch is not there. Or, for example, in the case, the one case that has been in the papers a lot is palm oil production from Indonesia is a good example.

That is not in, those kinds of corrections are not in the model. That's why it's very important that land conversion has to be thought of in the future.

MR. STEVENSON: Did the Commissioners believe that there should be some estimate of that included in this.

CHAIRPERSON PFANNENSTIEL: Maybe in the resolution that we are considering it does point out that we should consider that issue.

MR. STEVENSON: I believe the resolution approves the work as is without the estimate though.

CHAIRPERSON PFANNENSTIEL: But we are considering acknowledging the need for updates such as land use index.

MR. STEVENSON: But it approves as is right now.

CHAIRPERSON PFANNENSTIEL: The resolution is that we are considering is actually out there so you can read what we would be approving.

MR. STEVENSON: One other comment, I would support Commissioner Boyd's point to include a biostream that is not encumbered by similar kinds of land use and that is agricultural waste. Is there, and that is also going to be resolved to consider doing that?

COMMISSIONER BOYD: Well I think within the context of finishing the plan we are offered an opportunity to address a lot of the points that are being made here today in the overall push to define our alternative fuels futures.

I think you've sat through some of the other workshops. And for those of us who followed all the public discussion of this subject and the low-carbon fuel standard development have recognized and now we're getting into the model debate.

And as I indicated earlier while I think this is a big bite and a deep dive into the subject area we recognize and everybody recognizes, academia and otherwise that more needs

to be done.

One of the driving forces for this agency putting more money into the next phase of the GREET model is to address some of the issues that you've raised.

And I know the ARB is interested in the GREET model and other models that have been tossed into the arena in the recent debate. However models that have not had nearly the amount of peer review that GREET has, what we're dealing with here is typical but society has to deal with the absolute best there is to deal with at a point in time when you have to make these decisions.

And the GREET California Model as it's known is the best there is in our opinion. And with its limitations we'll move forward on the subject.

And we've all acknowledged the need and I think the University of California folks have also indicated the need to just continuously improve and update what the knowledge we have and the comprehensiveness of models that are used by decision makers in making recommendations.

Fortunately I think we have enough time in both in terms of implementing any alternative

fuel plans, short term, mid term, and I think the ARB has plenty of time in its 18 month time frame to recognize, acknowledge and provide input on some of the questions that I hear being raised today.

So they're good questions and they will be dealt with. Some of them aren't dealt with to the satisfaction of all and at this moment in time I mean today.

MR. STEVENSON: One other comment. As a modeler myself, I'm --

COMMISSIONER BOYD: Ah, seeking perfection, excuse me.

MR. STEVENSON: -- very willing to, well it's a continual process but at all times it seems like it's prudent to make a best estimate.

And I would ask that we do make a best estimate on the land use impacts.

CHAIRPERSON PFANNENSTIEL: Thank you. Do we have someone on the phone? Please go ahead. She's not there?

MS. JUNQUERA: (Via phone) Can you hear me?

CHAIRPERSON PFANNENSTIEL: Yes we can. Please identify yourself for the record.

MS. JUNQUERA: Hi this is Victoria Junquera with ERM. We're an environmental consulting firm that was commissioned by the Western States Petroleum Association to perform a review of the TIAX model.

ERM reviewed the February draft and the final June report and submitted comments on both reports.

And I just wanted to reiterate your general opinion of the final plan model. We believe that performing more about sensitivity analysis of the model is very important in order to be able to use the model for regulatory purposes.

In other words we would like to see the final result with a plus, minus associated with it so that it is understood what kind of uncertainties associated with the final results.

And just a quick comment on other technical issues that we brought up that TIAX agreed needed further study.

Of course, the much discussed land use issue as well as agricultural runoff and water use which were not taken into account in the model.

And finally nitrogen oxide, nitrous

oxide rather emissions pathways are treated in a simplistic way in the final TIAX model where other fuel cycle models treat it in a much more sophisticated manner and look at many different nitrous oxide emission pathways. That was another one of ERM's comments. Thank you very much.

CHAIRPERSON PFANNENSTIEL: Thank you very much. Barbara Fry.

MS. FRY: Good morning Commissioners. I'm Barbara Fry. I'm Chief of the Measures Assessment Branch of the Air Resources Board.

And on behalf of the Air Resources Board we recommend that you adopt the full fuel cycle analysis today that was prepared in response to the legislation.

And we acknowledge that based on previous comments from the fuel cell collaborative we did ask TIAX to increase the efficiency of the hydrogen. And they did do that.

And that may have resulted in some inconsistencies in tables, but the numbers reflect better energy efficiency for hydrogen vehicles. So that issue was addressed.

And we do acknowledge that there's going to be updates needed. As part of this process

we'll have to update it to reflect land use and other issues as they arise. But we think it's important that you proceed today to adopt this fuel cycle analysis as the best available to date with the knowledge that it will be updated later.

And then we'll use it to develop the plan and refine it as we proceed with the low-carbon fuel standard, thank you.

CHAIRPERSON PFANNENSTIEL: Thank you. Any other comments, anybody else in the room or on the phone who'd like to comment to us on the subject?

If not, Commissioners we have in front of us a resolution, and I know there are some on the table outside. There are also two changes that we have heard, suggested for this resolution.

One would be to add and I would suggest it's probably in the next to the last bullet, some recommendation to the Air Resources Board that they don't allow a degradation of other pollutants and somebody might want to work on the language.

COMMISSIONER GEESMAN: Madame Chair.

CHAIRPERSON PFANNENSTIEL: Commissioner Geesman.

COMMISSIONER GEESMAN: Let me try on

that one. Looking at that bullet and at the very beginning of the litany of goals where it currently starts out with, to reduce petroleum use, I would suggest that we insert, to improve air quality, comma.

CHAIRPERSON PFANNENSTIEL: Excellent. Are there other? There was a suggestion that we change the description of ongoing updates for land use impacts. I don't know whether anybody wants to suggest some wording changes there. I think that the language that is there is sufficient for my comfort level.

COMMISSIONER BOYD: I would think within the context of the discussion we've had, this resolution and the work that your committee is doing on the 2007 Integrate Energy Policy Report, and the strong recommendations in the 2005 report which guided the discussion in the 2006 update, which are guiding your work, pretty well send a strong signal to everyone that we're deep into land use. And I don't see John Shears anymore but I think it's both tracks that he's concerned about.

Just the general VMT reduction concepts of land use, if I may use that, and then the land

use aspects associated with the production of various fuels I think are intended in the work of all -- our agency and I know with regard to the ARB. So I for one think the language is, it would be hard to make it so comprehensive that we make everybody feel like they're satisfied.

Again, that's a long way around saying that the language here is pretty good. But I'm certainly open to any thoughts any other Commissioners might have.

CHAIRPERSON PFANNENSTIEL: Well with that is there a motion for approving the resolution as modified by Commissioner Geesman's addition as we have in front of us now. I'm not intending to read the entire resolution.

COMMISSIONER BOYD: I'd like to make a motion to approve the resolution but I want to bring up two additional points.

That one, Mr. Jackson indicated in his opening remarks that there were minor errors and at that time we clarified that they were non-substantive. They were pagination, grammatical, et cetera errors that need to be taken into account before we actually pass the report on to the ARB. And I think it just goes without saying.

And I guess secondly as a result of Ms. Dunwoody's testimony the idea of also assuring internal consistency between language and tables. And I think Mr. Jackson acknowledged that that can be handled. So I would move approval of this resolution and this report, taking into account those facts and Commissioner Geesman's suggested modification.

CHAIRPERSON PFANNENSTIEL: Is there a second?

COMMISSIONER BYRON: As associate member of the Transportation Committee I'd like to also provide my support for this resolution.

Although I think we're probably all a little bit disappointed that we can't be providing more at this point. I am also convinced and very supportive of the approach that the additional time will produce a much more valuable report and also I think give us a little more time for the necessary review of the stakeholders that we're looking for. So I second the motion.

CHAIRPERSON PFANNENSTIEL: Thank you. Further discussion? Commissioner Geesman? No.

COMMISSIONER BOYD: I would just like to thank all the stakeholders.

CHAIRPERSON PFANNENSTIEL: I would like to -- and the staff. A lot of extra efforts went into this.

COMMISSIONER BOYD: Those who went out on the limb with us to acknowledge the need to delay this approval. It is with great trepidation that bureaucratic agency suggest not meeting a legislative deadline. And I appreciate the support we've had from everyone else in recognizing that and conveying that fact to all the policy makers and leaders. Otherwise it would be very lonely out there.

CHAIRPERSON PFANNENSTIEL: With that I'll call for a vote. All in favor.

(Ayes.)

CHAIRPERSON PFANNENSTIEL: Any opposed? It's approved. Thank you all.

COMMISSIONER BOYD: Good job by all.

CHAIRPERSON PFANNENSTIEL: We'll be adjourned.

(Whereupon, at 11:00 a.m., the special business meeting was adjourned.)

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CERTIFICATE OF REPORTER

I, RAMONA COTA, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Special Business Meeting; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of July, 2007.