

BEFORE THE  
CALIFORNIA ENERGY COMMISSION

In the matter of, )  
 )  
The Role of Alternative Fuels in ) Docket No. 11-IEP-1L  
California's Transportation )  
Energy Future )

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**ORIGINAL**

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1 P R O C E E D I N G S

2 NOVEMBER 14, 2011

1:06 P.M.

3 MR. PAGE: Good afternoon. My name is Jim Page  
4 in the Fossil Fuels Office at the Energy Commission.  
5 Welcome to the Staff Workshop on the Role of Alternative  
6 Fuels in California's Transportation Energy Future.

7 Before we start, I have a few housekeeping items.  
8 You need to know that this workshop is being recorded.  
9 If you do speak, please come up to a microphone, give  
10 your name clearly for the recorder, and probably your  
11 affiliation would help, as well.

12 For those of you not familiar with the building,  
13 the restrooms are across the aisle. There's a snack bar  
14 on the second floor under the white awning.

15 In the event of an emergency and we get the fire  
16 alarm, just follow Energy Commission staff out the doors.  
17 We'll meet over in the park across the street. So,  
18 again, please at that point proceed calmly and quickly.

19 Today's agenda is a continuation of work that was  
20 first presented at the September 9th Transportation  
21 Committee Workshop. It will contain some revisions of  
22 our work there. The work is intended to be a  
23 contribution to the Integrated Energy Policy Report, also  
24 called the IEPR for short.

25 As you can see from the agenda, staff intends to

1 cover several topics or aspects related to increased use  
2 of alternative transportation fuels. First, we'd like to  
3 present an overview, including trends and forecasts in  
4 transportation fuel use, as well as ranges of incremental  
5 costs of vehicles and infrastructure for alternative  
6 fuels. Second, we'll review the Federal Renewable Fuels  
7 Standard, also called the RFS2. And finally, the Energy  
8 Commission staff and Air Resources Board staff will  
9 discuss their analysis of the Low Carbon Fuel Standard,  
10 the LCFS.

11 We seek audience participation today, so after  
12 each of the presentations we'll have time for questions  
13 and brief comments. There's also a designated public  
14 comment period for longer comments. We have blue cards.  
15 Probably to keep it more efficient, if you want to speak  
16 at the public comment, it would help to fill out a card  
17 so we have your name, and I don't think that's  
18 necessarily obligatory, but it might make it more  
19 efficient.

20 That concludes my introductory comments.  
21 Commissioner Boyd, would you like to...?

22 VICE CHAIR BOYD: Thanks, Jim. Good microphone  
23 today. I don't have too much more to say. You've given  
24 a good background. I would comment this is, as  
25 announced, a staff workshop on the Role of Alternative

1 Fuels, and even though there's a lot of emphasis and  
2 concentration in the Hearing Notice on certain facets, I  
3 for one am interested in the entire field of alternative  
4 fuels, as is this agency. And in preparation of our  
5 Integrated Energy Policy Report, we will be touching upon  
6 all fuels deemed to be alternative fuels. But as Jim  
7 indicated, Jim Page, that this is a follow-on to our last  
8 hearing, which was enlightening, informative, raised a  
9 host of questions that staff has pursued more, and the  
10 staff is anxious to learn and absorb more today before we  
11 finalize the Integrated Energy Policy Report.

12           So, being a staff workshop, it should be  
13 considered quite informal and also, as indicated, we  
14 really want audience participation. The set-up of this  
15 room is always very stuffy and formal, but in trying to  
16 have people participate, if you have questions, raise  
17 your hand bound up, all that we ask is that you come to  
18 the microphone so everybody can hear, particularly those  
19 people who are listening in.

20           And we look forward to learning more on this  
21 subject so that we might finalize the transportation  
22 components. As the Lead Commissioner on Transportation  
23 Fuels, that's why I'm here today, to learn more on the  
24 topic myself and see what we can contribute to the  
25 overall goals and objectives of the State and its various

1 agencies in the arena that involves the use of various  
2 transportation fuels and alternative fuels, in  
3 particular. So with that, Jim, I think I'll turn it back  
4 to you and let the staff start their presentation. Thank  
5 you.

6 MR. PAGE: Yes. And I'll just add that we have  
7 presentation hard copies in the foyer. I think they're  
8 all there. There might be one coming late. I guess  
9 they're all there. With that, Gary Yowell will be our  
10 first presenter.

11 VICE CHAIR BOYD: While Gary is getting ready,  
12 I'll just say, on my right, your left, is my Advisor who  
13 handles most of the Transportation Fuels issues for me,  
14 Tim Olson. And on my left, we've just been joined by  
15 Sara Michael, my Principal Advisor. So my office is  
16 three-fourths here, the only one behind is my Executive  
17 Assistant. So thank you both for joining us.

18 MR. YOWELL: I can't quite find my presentation.

19 VICE CHAIR BOYD: We are slaves of the electronic  
20 world and sometimes we pay for that.

21 MR. YOWELL: So in conclusion, if there are any  
22 questions, I'll take them now. All right, here we go, I  
23 promise. Good afternoon, I'm here to provide a  
24 historical context and perspective to the forecasts and  
25 show how important these past issues are and how they

1 influence future forecasts and how they kind of permeate  
2 past and futures.

3           So with this, here I'm showing the last 61 years  
4 of fuel demand in California of both gas and diesel  
5 combined use, and I'm showing the low and high petroleum  
6 demand forecasts, 20-year forecasts that we have for the  
7 IEPR presently, as well as the biofuel contributions on  
8 top of the petroleum side. And here we split out the  
9 petroleum, the gasoline side on top, and the diesel  
10 production consumption on the bottom, diesel on road at  
11 the very bottom, and diesel on and off road is above  
12 that, and the IEPR forecasted petroleum components and  
13 renewable components there. And, of course, we're here  
14 to talk about the renewable and the RFS requirements  
15 towards these future fuels.

16           There's a historical context of the population  
17 growth and the fuel demand; for the last 55 years, it's  
18 been fairly tightly linked together. And if you were to  
19 extrapolate that forward as shown here in the red dash  
20 lines, you would see the fuel demand going forward, but  
21 the projected future populations are being forecasted  
22 downward in the future. So if the Department of  
23 Finance's forecasts are realized, then we would expect  
24 the fuel demands to also track the population, as well,  
25 all things being equal.



1           Our long-term per capita diesel demand is up  
2   since 1950. Our gasoline demand is down since 1970. And  
3   those trends will perhaps continue into the near future.  
4   The overall fuel demand is about even on a per capita  
5   basis, at the top blue bar.

6           What's happened in the last decade? If we look  
7   at this last decade in context with the 55-year historic  
8   trend, we can see about a five billion gallon decline in  
9   projected -- in fuel use. If you look at the 1990's, the  
10   roaring 90's, we had a bit of a more aggressive use of  
11   fuel, but over the 55-year term, I've used that as my  
12   benchmark, my business-as-usual trend line, if you will.  
13   And what we've done is look at the historical data and  
14   contrasted that with the Department of Motor Vehicle  
15   registration vehicle counts, the fuel use report to the  
16   Board of Equalization, and whatnot, and we've quantified  
17   the petroleum reductions attributed to all the  
18   alternative fuel vehicles and alternate fuels that we can  
19   get a handle on, and we're left with this big red bar gap  
20   of what we can't account for from the vehicle technology  
21   side, and so that I've labeled as a consumer response,  
22   perhaps in response to the high fuel prices that occurred  
23   since 2004, the recession and unemployment, and other  
24   activities that go beyond what we can account for from  
25   the vehicle technology end.

1           So if I remove the Ethanol and the Consumer  
2 Response parts of this graph, we have this part here and  
3 we can show the remaining part, and mostly of the  
4 alternative fuel part to this historical trend. And you  
5 can see about 60 percent of what's left here is  
6 attributed to the light duty diesels and the hybrid  
7 vehicle technologies, and those are not alternate fuel  
8 vehicles. But above that, the 40 percent remaining,  
9 that's the alternative fuel sliver, in addition to the 10  
10 percent Ethanol part that we've taken out earlier.

11           Looking more at the DMV data, we can track the  
12 vehicle population migration and we can see here the  
13 three technologies that have been selling the most  
14 significantly in the year 2000, which is the light duty  
15 diesel cars, the flexible fuel cars, and the hybrid  
16 vehicles. The light duty alternative fuel vehicles are  
17 relatively flat with the propane, the natural gas, and  
18 electric vehicles, neighborhood and highway legal  
19 electric vehicles are fairly flat.

20           Here we've taken the DMV data and looked at  
21 putting all these new technologies on the same time frame  
22 to show when they started into market, how many years it  
23 took to reach their peak sales, and so from this graph,  
24 we can see the natural gas, the hybrid, and the flexible  
25 fuel vehicles are growing at about a 10 percent clip.

1 And so what that means is, over 18 years in these  
2 technologies, if they continue at that rate, we'll reach  
3 basically about 10 percent of the vehicle market for the  
4 light duty vehicle classes.

5 Also -- we have a pointer here -- so we have  
6 compressed natural gas and electric vehicles are  
7 operating at about a one percent, or less than one  
8 percent of the market share. And we've got electric  
9 vehicles here showing an assumed 10 percent Nissan Leaf  
10 migration into next year, just to illustrate the context  
11 of what that new technology may look like in relationship  
12 to all the other vehicle technologies.

13 I'd also like to take a look at this hybrid  
14 vehicle technology which by most accounts would be  
15 considered a very successful technology introduction. So  
16 if I take that technology and I plot it here, here I'm  
17 showing that technology which is about 1.7 percent of the  
18 fleet; if we let the computer extrapolate that out, based  
19 on its past performance, you can see it would take about  
20 20 years for it to reach about 12 percent of the total  
21 fleet population. And this just illustrates the length  
22 of time it takes for any vehicle technology to get into  
23 the market and to make a difference. And this is just  
24 what it takes.

25 Likewise, the same is true with the natural gas,

1 the heavy duty natural gas has the same long term 18-year  
2 trend to hit to a 2.5 percent market penetration level.

3 We have electric trolley buses here in green,  
4 moderately growing, and we have propane that's fairly  
5 flat.

6 One interesting observation we've observed from  
7 the DMV database is the historic new vehicle sales, shown  
8 here in red, the fuel economy of historic new vehicle  
9 sales. And what we can see in relation to the green dash  
10 line, which is the retail price, average retail price for  
11 California, we can see how consumers have been, as  
12 recently as 2005, have significantly shifted into higher  
13 fuel economy vehicles. That's foregoing the larger  
14 vehicle into a smaller fuel economy vehicle. And so we  
15 can quantify that based on an actual population of  
16 vehicles. We can also quantify the fleet fuel economy in  
17 purple here shown. So when you have like 1.8 million  
18 vehicles getting higher fuel economy, their impact is  
19 diluted with the 25 million vehicle fleet population.  
20 But we can quantify that effect and this does feed  
21 forward into future modeling aspects.

22 To which, I've got -- here is our 2011 IEPR  
23 forecast and, Malachi, do you have some comments for  
24 this?

25 MR. WENG-GUTIERREZ: Sure. I was just going to

1 make a couple of comments about this. It's one of our  
2 cases that we're showing here and I believe it's the high  
3 petroleum case, these are the population of vehicles that  
4 are presented and it doesn't really reflect the highest  
5 electric vehicle population condition, which would  
6 actually be in the low petroleum demand case, which will  
7 be the other, and there's a Slide following that will  
8 show that.

9 But just as Gary had mentioned, you know, some of  
10 the reasons why you have the adoption rates you do,  
11 incremental costs, other things like limited range and  
12 other challenges expanding out of existing niche markets,  
13 one of the interesting things if you look at the existing  
14 alternative fuel vehicles, you can find them in specific  
15 niche markets, fleets, commercial applications, and the  
16 quantities that are in the actual residential sector are  
17 not as large. So I think there is somewhat of a  
18 challenge to get out of those niche markets into mass  
19 adoption.

20 But I think recently, and certainly under some of  
21 the conditions in our forecasts, we're assuming that we  
22 have really good conditions for alternative fueled  
23 option, high prices, you know, policies and an emphasis  
24 on energy security, nothing new, but it's certainly good  
25 conditions for the adoption; hopefully we will have those

1 conditions. And I think that lends itself to the  
2 adoption of the alternative fuel vehicles that you see  
3 here. And if you could go to the next Slide -- this  
4 Slide, actually.

5           So in this Slide there's a couple of things you  
6 can see is, again, the hybrids and the PHEVs are getting  
7 adopted at probably the highest rate of all the fuels  
8 here. Arguably, the incremental costs of those vehicles  
9 are going to be the lowest of all the alternative fuels,  
10 and then they're going to offer the most amount of  
11 utility to consumers.

12           These obviously assume -- these volumes of  
13 vehicles, or the amount of vehicles that are coming into  
14 the marketplace -- would assume that they are being  
15 offered in quantities for adoption. So if there was a  
16 decision to stop producing hybrids, or to not use the  
17 PHEVs, or introduce PHEVs, then these numbers would not  
18 be this large.

19           And one of the other items I wanted to highlight  
20 is the green line here is the flex fuel vehicle and that  
21 will be important for the adoption of biofuels and we'll  
22 discuss that a little bit later, as well. Next Slide,  
23 please.

24           So this is -- sorry for the legend, it's not  
25 exactly explanatory here, but there are two cases that we

1 generally look at that bound the demand conditions. Case  
2 1 is our Low Petroleum Demand Case, which is supposed to  
3 represent the high alternative fuel use demand. So,  
4 hence you see that the red line here for Case 1  
5 illustrates a higher amount of electric vehicles being  
6 introduced and also, then, a higher amount of electricity  
7 being consumed. Then, the CVC and the PVC components are  
8 just basically the shortened names for our different  
9 models that we use to model these different sectors. PVC  
10 is the Personal Vehicle choice model, and the other is  
11 the commercial vehicle choice model.

12           So I wanted to show here, again, you don't really  
13 get to see the historics where commercial sectors have  
14 adopted alternative fuels readily into their fleets just  
15 because of the duty cycles and their ability to use the  
16 alternative fuels in their specific markets. But we  
17 still have to then expand outside of those niche markets  
18 and get into this residential or consumer side to really  
19 get market penetration. I think that's part of the  
20 challenge that is before us. Next Slide.

21           And then the last Slide that I wanted to show,  
22 just a quick picture of some of the values, the  
23 incremental values that we have in our model. Again, as  
24 inputs, there are plenty of different incremental prices  
25 that we can show, but relative to electric vehicles,

1   there are fairly large incremental costs over time and I  
2   think everybody kind of recognizes that. Probably the  
3   one thing that is interesting here is that the red line,  
4   which is the highest incremental cost, in the near term  
5   is about \$60,000, that really is reflecting the  
6   introduction of, say, one vehicle which would be like the  
7   *Tesla*. That is a sports car model. These incremental  
8   costs are incremental costs across all types or classes  
9   of vehicles. So the red bar there is basically the *Tesla*  
10   and I think part of the reason why it's so high is that  
11   what it's being compared against as far as incremental  
12   costs is really a fleet-wide average of sports cars,  
13   which would obviously have a much lower cost point.

14           So if you were to look at the highest cost  
15   electric vehicle, or the *Tesla* in comparison to the  
16   highest cost gasoline vehicle, the incremental costs  
17   would not be so large. But, again, this just illustrates  
18   a range of incremental costs for the specific type of  
19   this technology, and then the rate at which it's dropping  
20   over time in our model. So there could be other  
21   discussions about how other rates have declined for these  
22   incremental prices or how subsidies might influence these  
23   prices, and that sort of thing. But I wanted to  
24   illustrate that as one of the inputs to our model and  
25   also one of the challenges to adoption of alternative



1 fuel vehicles.

2 VICE CHAIR BOYD: Malachi, that's a good  
3 illustrative use of the graph. I hate to disappoint the  
4 audience, but they don't make that roadster anymore,  
5 they've stopped producing it.

6 MR. WENG-GUTIERREZ: No, I know. Well, they'll  
7 be coming out with their next --

8 VICE CHAIR BOYD: Anyone who wanted one is going  
9 to have to go scrounge up a used one somewhere.

10 MR. WENG-GUTIERREZ: Yeah, the incremental cost  
11 might be even higher now since it's a limited edition.

12 VICE CHAIR BOYD: They have announced their four-  
13 door at about a \$49,000 starting price, I believe.

14 MR. WENG-GUTIERREZ: Model S. And then,  
15 actually, the green line here is the next -- basically  
16 the next highest incremental cost if you pull out the  
17 sports car. So, again, without the *Tesla*, you see a much  
18 narrower band of incremental costs and it's really just a  
19 product of how few electric vehicles are in the  
20 marketplace and, you know, that could widen or narrow  
21 depending upon what vehicles are introduced in the future  
22 and what price point Tesla push out their Model S, and so  
23 we'll see how that develops over time.

24 MR. YOWELL: Okay and that also does not include  
25 the recharge for that vehicle, right?

1           MR. WENG-GUTIERREZ: Yeah. This is just the new  
2 vehicle purchase price, incremental cost only to that.  
3 So it doesn't deal with any of the infrastructure needed  
4 to charge it, or the installation of a home charging  
5 station, or any of that.

6           MR. YOWELL: Okay. Thank you. Well, here we  
7 pull it altogether, bring in the past history with the  
8 IEPR 20-year forecast and plot them up together so you  
9 can see the contrast of past to future forecasts. We do  
10 look bullish on plug-ins and hybrids, yes, but that said,  
11 this is what we have at the moment. Even by this  
12 accounting, basically 97 percent of all vehicles by 2030  
13 would still be using our current gas and diesel  
14 infrastructure that we have today.

15           I did put at the bottom -- I don't know if you  
16 can see it -- we've got the electric vehicles and the  
17 natural gas, and we broke them out because they use a  
18 different infrastructure. And they will triple in size  
19 from a one-tenth of a percent today to three-tenths of a  
20 percent by 2030, or basically triple in size by 2030, but  
21 they will still be a rather small fraction of the total  
22 overall fleet.

23           Here, I'm summarizing all the light duty vehicles  
24 and all the heavy duty vehicles altering fuel  
25 penetration, if you will. And so migration is slow, as

1 it should be, but this is the quantification of the  
2 alternative fuel side. If you take this alternative fuel  
3 migration and extrapolate it forward to 2030, this would  
4 be the business-as-usual current policies and past  
5 policies carrying forward, without any consideration of  
6 future policy changes, this is what it would look like.  
7 Basically less than a five percent penetration rate by  
8 2050. And that's perhaps -- that's consistent with past,  
9 even with the hybrid vehicle, it would be fairly modest  
10 for that level.

11           Okay, I have to beg your indulgence here with  
12 this. This is our transportation infrastructure  
13 comparison point. Here I'm comparing apples and oranges  
14 and grapefruits and mosquitoes and meteors all in one big  
15 Slide, so.... I have these fundamental two sources, the  
16 Commission has PIIRA data, which provides us access to  
17 the number of stations and their retail volumes, and from  
18 that we're able to estimate the median volume of fuel  
19 cells. So this is basically retail sales volumes. And  
20 the bolded values are actual values from our sources.

21           The shaded columns are based on our AB 118  
22 program results where they're in bold, and those are  
23 actual projects that we've funded, or an average of  
24 projects that we've funded, costs to build a plant, or to  
25 build a renewable or a biofuels station, and the second

1 column shows the capacity. That's like the 12-hour  
2 capacity of each one of those stations, that's running  
3 full out, no stops, just the capacity. So what we're  
4 able to do is bound the argument between absolute  
5 theoretical possibility and retail median reality, if you  
6 will.

7           Now, some of these technologies, we don't have  
8 much retail experience, like on the hydrogen side, so we  
9 have to use the Applicant's estimates for that point.  
10 I've got a few Slides out of order -- I'll get back to  
11 that Slide in just a second. From our data, we also have  
12 a tracking of the diesel migration of retail stations.  
13 We can see the diesel station is now up to almost 50  
14 percent and they seem to be moving forward. This is  
15 occurring behind the scenes and this is occurring behind  
16 the scenes, as well.

17           We have in our PIIRA data the population up to  
18 2010 of the E85 stations. We have our AB 118 program is  
19 funded, about 85 new E85 stations, and that's shown up  
20 here in the 2013 box. And if this program was to  
21 continue funding in future years, we would get this ramp  
22 up all the way to 2020, presuming that the funding  
23 exhausts on that point and hopefully the industry would  
24 carry that technology forward. So this is used in the  
25 forecast modeling in estimating the potential

1 opportunities for flexible fuel vehicles and E-85 use for  
2 RFS compliance and whatnot.

3           Okay, back to that hideous table I showed you  
4 earlier. This shows the infrastructure costs on a per  
5 gallon capacity basis. This shows in blue across all  
6 technologies, it shows the station capacity, that's the  
7 absolute maximum theoretical it can get to, the lowest it  
8 can get to based on the cost to date that we know of.  
9 And the green is the retail side, what's typically  
10 selling in the retail world. Now, some fleets, some  
11 technologies can approach the blue side if they're using  
12 a fleet application. For example, we have some hydrogen  
13 that are applied to an Alameda transit authority, which  
14 has a very high throughput, so they can actually come  
15 down to the blue level, whereas most other retail  
16 stations are about a midway point between the green and  
17 the blue.

18           And we've shown here hydrogen in two different  
19 units; one is in kilograms of hydrogen dispensed, or in  
20 the gas and gallon equivalent, whatever is most  
21 convenient for you. Carrying this forward, those units  
22 into -- oh, yes?

23           MR. WENG-GUTIERREZ: I was just going to point  
24 out that the units on the left here, this is a log scale,  
25 right?

1           MR. YOWELL:   Yes.

2           MR. WENG-GUTIERREZ:   So I just wanted to make  
3   sure that everybody was aware of that, so that although  
4   it looks fairly -- you know, on the right, it's not that  
5   much higher, it's definitely sensitive to scale, so much  
6   larger there that it's pretty significant.

7           MR. YOWELL:   Thank you for pointing that out.   So  
8   carrying that information forward, when Malachi and  
9   Gordon are looking at billions of gallons of ethanol or  
10   renewable fuel, I've carried these units forward, too, so  
11   we can look at how much it would cost to dispense a  
12   billion gallons of hydrogen, or a billion gallons of  
13   ethanol, or electricity.   And so we have this and this  
14   will be used as we go forward in evaluating different  
15   policy option and choices.

16           Here, we're looking at the same information, but  
17   from the station owner's perspective.   So a retail  
18   station owner, retail gasoline or diesel, say a two-  
19   tenths or two cents a gallon based on the median station  
20   volume throughput that we know today, based on the  
21   average cost today of a median station.   And likewise, we  
22   would pay about \$2.05 per kilogram on a hydrogen basis,  
23   based on the median station estimate by the applicants,  
24   which would translate to a \$.93 per gallon incremental  
25   cost because the vehicle gets so much better fuel economy

1 at 2.2 EER efficiency assumed. And we would have the  
2 range of other options shown here.

3 Now, the hydrogen station has proposed a lot of  
4 complex problems and issues in trying to quantify that  
5 because it's a very uncertain technology and volume. So  
6 here, we've started a hydrogen station analysis, which  
7 we'll use as we go in the future when we try and model  
8 hydrogen fuel cell vehicle penetration levels. So if we  
9 assume a fuel cell vehicle with these miles and fuel  
10 economy, and we use our latest information from our AB  
11 118 program, \$2.7 million per station, which has a  
12 capacity of this amount which is enough to fuel 5,000  
13 vehicles, and if we assume that station lasts 15 years  
14 when we can get to this parametric chart.

15 Let me walk you through this just a little bit.  
16 So what we're saying is, if we built five of these  
17 stations at that cost, and if we had 100 vehicles there  
18 to fuel from that station, the station owner would have  
19 to charge \$61.00 per kilogram that they dispensed to pay  
20 for the rent on that equipment. Likewise, if he had  
21 5,000 vehicles going to those five sites, they would only  
22 have to charge \$1.20 per kilogram. And what this shows  
23 over the spectrum of issue is the complex and the high  
24 cost penalty associated with building 1) too many  
25 stations too early, which is what you want to do to

1 encourage the technology, but it has a very significant  
2 cost penalty if the private sector was to do that on  
3 their own.

4           Now, here is the next table, same as the one  
5 prior, but here I've just converted it to gas and gallon  
6 equivalent units. So this is what the consumer would  
7 see, and here we have the one station column so you can  
8 see the station that we just funded, if it had 5,000  
9 vehicles there servicing that -- which incidentally is  
10 what the average retail station in California has, is  
11 about 5,000 vehicles going to them -- you could sell the  
12 fuel at a \$.11 gas gallon equivalent basis.

13           And here we're applying the infrastructure and  
14 the alternative fuel vehicles' incremental cost together.  
15 Here, we're using our 2011 IEPR light-duty vehicle  
16 incremental cost estimates. I have a bogey here for a  
17 fuel cell vehicle, not knowing what they would retail at,  
18 but right here I've got \$50,000 as a starting point, just  
19 as an illustration point.

20           So here I want to add the incremental cost of the  
21 vehicles and the benefits from those to the  
22 infrastructure costs that we just looked over. And so  
23 here I can show the total vehicle and station cost per  
24 gallon capacity. So, as we look at other options, as we  
25 look at LCFS compliance, we'll be looking at these costs



1 and seeing if we can make a better, more cost effective  
2 option solution here for us.

3           Here is -- we take the ARB scenarios that they've  
4 had, I guess they have like six or eight scenarios and  
5 they have a uniform population of fuel cell vehicles,  
6 battery electrics, and PHEVs shown here on the left-hand  
7 column. As we don't have any strong feel for the costs,  
8 we've applied varying costs, incremental scenarios across  
9 the board. And then it's a simple math to multiply the  
10 vehicle population times the incremental cost, and we can  
11 get a total cost below to estimate anywhere from \$12  
12 billion to \$102 billion range of scenarios. And these  
13 are things we're right now playing with and trying to  
14 understand how these will play out, forward. With that,  
15 I think I'm done. Any questions?

16           VICE CHAIR BOYD: Thanks, Gary. I don't have any  
17 questions. Any audience questions? Yes, go for it.

18           MR. MCKEEMAN: Jay McKeeman, California  
19 Independent Oil Marketers Association. In your  
20 infrastructure cost, did you determine any of the costs  
21 that might be related to distribution? You know, natural  
22 gas or hydrogen, or whatever, there may need to be fairly  
23 significant costs invested into how to get that fuel from  
24 the manufacturing point to the ultimate consumer. And I  
25 was wondering if you'd looked at any of those costs.

1           MR. YOWELL: We do capture the transportation  
2 costs, getting to components all the way to the end user  
3 from the source to the -- so, yeah. We didn't show those  
4 today.

5           MR. MCKEEMAN: Okay. They're included in the  
6 calculations?

7           MR. YOWELL: Yeah, for sure.

8           MR. MCKEEMAN: That would be good to see.

9           MR. YOWELL: Okay.

10          MR. SCHREMP: Well, Jay, this is Gordon Schremp,  
11 Energy Commission staff. Are you meaning those kinds of  
12 higher distribution infrastructure costs when we look at,  
13 say, LCFS compliance costs? Is that the kind of cost  
14 question you're asking?

15          MR. MCKEEMAN: I guess, if that's what these  
16 tables are trying to represent, is the financial impact  
17 of LCFS, absolutely.

18          MR. YOWELL: Well, that's what you'll be  
19 presenting later on, Gordon, with the total costs. This  
20 is just showing the infrastructure costs, just a very  
21 narrow sliver.

22          MR. MCKEEMAN: Right, but infrastructure, you  
23 know, there's a cost to retail station, but there may be  
24 other costs associated with getting that fuel from the  
25 manufacturing point either to the station or to the

1 consumer.

2 MR. SCHREMP: Yeah, Jay, this is Gordon again.  
3 We recognize that in our transportation demand forecasts,  
4 both low and high, we have a variety of alternative fuels  
5 and examples are E85 compressed natural gas, electricity  
6 use. Why those fuels are being used at higher levels of  
7 demand is for a variety of reasons, it could be fair  
8 share compliance with RFS2, it could be LCFS, it could be  
9 the ZEV mandate program, automobile manufacturers rolling  
10 out more PHEVs, BEVs, things like that. So we recognize  
11 there's two kinds of cost -- incremental vehicle cost and  
12 infrastructure costs. And for a lot of those  
13 technologies, including hydrogen, the infrastructure  
14 required to dispense an adequate quantity of fuel under  
15 our demand forecasts is inadequate and would have to be  
16 built, and would have a cost. So it comes down to the  
17 argument that, okay, society will essentially have to pay  
18 those costs -- business people, consumers -- how should  
19 they be apportioned or specific types of State and/or  
20 Federal regulations? That's a big argument. Yes, that's  
21 correct.

22 MR. MCKEEMAN: Okay, thank you.

23 MR. BOYCE: Bill Boyce with SMUD. I was just  
24 wondering if you could go back to Chart 21 and elaborate  
25 on the source of data for the Plug-In Hybrid

1 infrastructure. Currently, I think that reflects Level 2  
2 charging, which we're seeing significant portions aren't  
3 requiring that with the current market price.

4 MR. YOWELL: Right. This is the value we have in  
5 our Investment Plan, cited for Level 2 charging, right.  
6 What would you recommend as an alternative?

7 MR. BOYCE: I think there would need to be some  
8 assumptions made on how much of the Plug-In Hybrids are  
9 actually going to be able to live off Level 1.  
10 Obviously, an Investment Plan that is a different number  
11 vs. the Level 2, and I think in general some of the  
12 percentages the market is starting to have would have a  
13 better source of data via percentage at Level 2 and then  
14 Level 1, of course, would be very low cost.

15 MR. YOWELL: Thank you.

16 SIMON MUI: Are you taking questions on the  
17 phone?

18 VICE CHAIR BOYD: There are still two people in  
19 the audience. We'll do that next.

20 SIMON MUI: Okay, thank you.

21 MS. GREY: Gina Grey, Western States Petroleum  
22 Association. Very interesting presentation, thank you  
23 very much for starting to compile this kind of  
24 information that I don't think we've seen in the past.  
25 And maybe it's just because I'm really tired today, but

1 it's taken me a bit to absorb. There's a lot of  
2 information and data here. So probably, if you'd taken  
3 five minutes per slide I would have absorbed it a little  
4 better, but I realize we're short on time.

5 In looking at, I guess, the final Slide which  
6 everyone always tends to do, they backtrack to the bottom  
7 line, and you looked at the ARB scenarios incremental  
8 costs matrix of about \$13 billion to \$102 billion, is  
9 this -- this is retail price scenarios, okay -- is this  
10 trying to compile everything in terms of the extra  
11 vehicle cost, what you anticipate the extra fuel cost,  
12 the extra infrastructure costs? Is that trying to  
13 compile it altogether? Or what does this reflect?

14 MR. YOWELL: This is merely the incremental  
15 retail vehicle price only, comparison. And so what we'd  
16 like to do is, yeah, take it out to a societal cost, that  
17 would be fine, where we add the infrastructure, and then  
18 the fuel cost savings or the fuel higher costs, and the  
19 maintenance in a perfect world. It will be a while until  
20 we get the maintenance side and get the long term  
21 durability aspects, but we're getting close.

22 MS. GREY: Okay, so there is a plan to pull all  
23 of these costs together and try and provide some kind of  
24 policy bottom line to folks?

25 MR. YOWELL: Not for this IEPR, but the

1 subsequent IEPRs, I believe, yes. As the data is  
2 available, yes.

3 MS. GREY: And -- go ahead.

4 MR. SCHREMP: I'll just interrupt. Our office  
5 does have a staff report, a Draft Staff Report we put out  
6 that feeds into the IEPR process. Staff will be  
7 finalizing that document and some of the additional  
8 information, we'll be putting that document -- it can  
9 include incremental vehicle costs, it can include  
10 infrastructure cost, and it will certainly include our  
11 follow-up work for the LCFS and RFS2 analysis that we'll  
12 be talking about this afternoon. So there is more  
13 information, so I think there's a means of getting that  
14 information into a document and then out to the public.  
15 I think Gary's comment is to the fact that a Draft IEPR  
16 is coming out very soon and it's likely we will not be  
17 finalizing our Draft or Staff Report until after that  
18 occurs.

19 MS. GREY: In light of that, I guess three quick  
20 comments. One would be, I think at a prior workshop we  
21 asked if the Commission could do annual updates on the  
22 transportation sector vs. the bi-annual and I think that  
23 would still stand for this since we're starting to see  
24 some interesting information about where these trends are  
25 leading us. Secondly, I think it would be interesting

1   this afternoon to hear from the ARB, who I believe is  
2   making a presentation on how these sets of data are being  
3   incorporated in the economic analysis for the LCFS, for  
4   example, and how the 2009 projections for monetary  
5   benefit to the State, you know, how this kind of compares  
6   with that statement that was made in '09. And I would  
7   just encourage that, as much of this information as  
8   possible be placed in this particular go-round on the  
9   IEPR. Very informative, very helpful, and I think it  
10   will probably help policymakers on a number of levels and  
11   I'm thinking, as well, of the Clean Fuels Outlet  
12   Regulation at the ARB that we're trying to work in a  
13   collaborative process on, and definitely some of this  
14   information would be useful for that, too. Thank you.

15           MR. WENG-GUTIERREZ: And this is Malachi Weng-  
16   Gutierrez. I just wanted to make one comment on this  
17   table. Again, I think it's just really taking the total  
18   vehicle populations, I think, that are presented in the  
19   ARB scenarios and showing them against a slew of  
20   potential incremental costs for the vehicles. I don't  
21   think these necessarily represent the actual incremental  
22   costs that would be observed because you would have a  
23   change over time, as well. So it's difficult to go down  
24   to the total line and say, you know, "these are the  
25   values that are associated -- the incremental costs

1 associated with any of those, the adoption of that many  
2 vehicles" because arguably it's going to take however  
3 long for these vehicles to come into the marketplace.  
4 Over that time span, the incremental costs would be  
5 changing and, you know, I think this is just to  
6 illustrate the potential costs if you were to kind of  
7 take a simplistic view to the calculation, but as I  
8 showed also, the type of vehicle, or the class of vehicle  
9 in the marketplace would play a role in the incremental  
10 cost value. So arguably, you could have PHEVs that were  
11 adopted in a certain class that would have a lower  
12 incremental cost than is represented in some of these  
13 numbers. So, again, this is kind of a quick calculation  
14 just to kind of show ballpark figures.

15 MR. FULKS: Commissioner Boyd, staff, who, these  
16 mics are working really well today. My name is Tom  
17 Fulks, I'm here today representing Robert Bosch Diesel  
18 Systems, who is also a member of the Diesel Technology  
19 Forum, which is a trade association for the diesel  
20 industry. We also represent -- I'm authorized to speak  
21 on behalf of those two entities, but I also do a lot of  
22 work with the LEV3 Working Group, which is made up of all  
23 the European Automakers plus Bosch. It's Audi, BMW,  
24 Daimler and Volkswagen, Plus Bosch. We have been working  
25 extensively on the LEV3 regulation with regard to diesel



1 engine technology, and then lately gasoline direct  
2 injection engine technology. And having stated all of  
3 those sort of bona fides, I wanted to begin my comments  
4 to at least -- I don't know whether I should congratulate  
5 or commiserate with your staff for trying to put all  
6 these statistics together because it's a tough job.

7           And as it relates to the light-duty automobile  
8 industry itself, I'd like to focus my comments on that  
9 area if I could, namely, we commiserate with your staff  
10 in trying to project into the future given the rapidly  
11 changing nature of this market as it is today. It used  
12 to be able to be measured by years, now it's actually  
13 changing by quarter, and it's even changing by month in  
14 terms of the different way consumers are responding to  
15 different technologies that are being offered on the  
16 market. So I'll give you specific examples, but I'd like  
17 to go through a couple of Slides first if I could, just  
18 to use those examples to illustrate how wrong some of  
19 your statistics look to us. So, if I could, if you don't  
20 mind, Gary, Slide 9, please.

21           Slide 9, we have no dispute with these  
22 statistics, but what we have a problem with, what I have  
23 observed is you'll notice it ends with model year 2009,  
24 that happened to be the very year that light-duty diesel  
25 engine technology, emissions technology, became legal or

1 compliant in California under the LEV2 regulation. So,  
2 diesel in 2009 finally became ULEV-compliant with the  
3 introduction of the Jetta TDI -- in 2009. So if you take  
4 a look at the three model years, or four model years  
5 since that time, and if you were to add another year to  
6 2011 on the right-hand side of the horizontal axis, you  
7 would see a spike in California in light-duty diesel  
8 vehicle sales because of that technology breakthrough  
9 that occurred that year. So, while this is accurate in  
10 terms of showing historical projections and trends of  
11 light-duty diesel vehicle sales in California, it is  
12 inaccurate in terms of the projection of where they're  
13 headed based on a three or four-year model year sales  
14 take rate that the industry has. And I'm bringing this  
15 to your attention to offer the assistance of our industry  
16 to your staff in terms of being able to peg some of these  
17 numbers and where light-duty diesel, in particular, is  
18 going. And in a minute I'll get to the gasoline direct  
19 injection portion of this, as well.

20           If we could move over to Slide 14? Now, you will  
21 see the diesel projected population in millions. While I  
22 would much rather that the vertical axis were in  
23 percentages vs. actual numbers, we will significantly  
24 dispute the projection to the 2030 model year based  
25 primarily on the rate of change on the horizontal axis

1   that is projected.  In other words, the industry itself  
2   projects minimum 10 percent light-duty diesel vehicle  
3   penetration by 2020.  And this -- Bosch originally had a  
4   projection of 15 percent, that was modified after the  
5   great crash of 2008 and 2009, given the reality of the  
6   economic conditions in America.  But, still, if you take  
7   a look at the rate of growth projected on that green  
8   dotted line, you'll see that it does not reflect a 10  
9   percent market penetration and that the 10 percent is the  
10  modest minimum projected market penetration by everybody  
11  who makes the cars, everybody who has to sell the cars.  
12  So I just wanted to bring to your attention that this  
13  slide is what we consider to be just abjectly wrong in  
14  terms of its own penetration.  On public announcements  
15  that have been made by all the OEMs, including General  
16  Motors, with the announcement that it was going to be  
17  introducing the *Chevy Cruze* diesel as a compliance tool  
18  for the new CAFE Standards.  So I think, again, we'll  
19  offer assistance of the industry to your staff in terms  
20  of getting you accurate numbers of what the projections  
21  look like; we're not complaining, we're simply saying  
22  let's talk to each other and we'll get these numbers  
23  right.  It's very important in terms of your overall  
24  liquid fuel use projections into the future and, in  
25  particular, the projections of the use of renewable

1 diesel or biodiesel fuel in certain concentrations. It's  
2 going to have an impact on those numbers if you get these  
3 numbers correct.

4           And then the last Slide I'd like to bring to your  
5 attention to is Slide 15, the next one. And what I am  
6 looking at is, once again, vehicle population  
7 projections. And I will just stipulate the same comments  
8 I had in the last Slide in terms of what the growth rate  
9 looks like. But I am sorry, your staff fellow here, his  
10 name is totally escaping me, it's on the front Slide --

11           MR. WENG-GUTIERREZ [presumed]: Malachi.

12           MR. FULKS: Malachi, yes. Great work, but the  
13 one thing that I heard verbally that I wanted to at least  
14 challenge was the statement that the incremental costs of  
15 hybrid technologies will be the least highest incremental  
16 cost of all these alternative powertrains. I would  
17 greatly dispute that vigorously primarily because of what  
18 is known as the projected incremental cost of not just  
19 light-duty diesel technology moving into the 2030  
20 timeframe, but also gasoline direct injection.

21           I sent to your staff today a link to the  
22 *Financial Times* story of yesterday that pointed out that  
23 hybrid electric vehicle sales of all platforms, all  
24 makes, not just Japanese, but American and Japanese, have  
25 plummeted in the past two months by up to 50 percent,

1 foreign in particular, the fusion hybrid has simply gone  
2 way down, primarily because of gains in fuel economy with  
3 conventional powertrain technology -- gasoline direct  
4 injection, in particular. The point is if you take a  
5 look at the very latest sales information and the very  
6 latest cost developments in technology developments in  
7 powertrains across the board, every OEM, the European,  
8 Asian, and American, you will see that these traditional  
9 internal combustion engine powertrain technologies are  
10 now becoming not just competitive in terms of fuel  
11 economy provided, we're in the low 40-mile per gallon  
12 range or in the mid 40's, but also now in cost  
13 competitiveness. And this now is being reflected in the  
14 actual sales trends. Yes, the tsunami in Japan, there's  
15 no question it had an impact, but that is not quantified  
16 in this *Financial Times* story; my point is this, I think  
17 it's important when you're doing light-duty vehicle  
18 powertrain growth projections that you stay in close  
19 contact with the industry so we can share -- extend the  
20 benefit of at least the internal projections that are  
21 being made by every single automaker in terms of where  
22 the industry is headed because this will have an impact  
23 on the rate of consumption and the rate of growth of your  
24 liquid fuels. So thank you for your indulgence, I  
25 appreciate it.

1           VICE CHAIR BOYD: Thanks, Tom. I'm sure the  
2 staff appreciated the compliments, as well as absorbed  
3 the suggestions. I guess -- and they're all good ones  
4 and I'm sure the staff will take you up on your offer of  
5 continued working relationship and dialogue -- I guess  
6 one of the concerns I have, or I don't know if it's  
7 really a concern, is it's really hard to predict the  
8 behavior of the American consumer and, you know, how do  
9 we know if the consumer is reacting to technology, or  
10 fuel price, or the fad of the moment? I think the staff  
11 is well versed in the projections of where gasoline  
12 powered internal combustion engine technology is going  
13 and its great potential, but by the same token, it's  
14 really hard for, of course, the sellers of the vehicles  
15 more so than us, to figure out what the American public  
16 is going to do. So I'm getting back to Gina's  
17 suggestion, "Gee, you ought to do these more often, like  
18 every year, at least." Good point. Don't know if we've  
19 got enough staff to do that, but nonetheless, I hear what  
20 you're saying. It's really hard to get a handle on where  
21 the American public is going.

22           MR. FULKS: Well, I appreciate that. I'll sit  
23 down, I know you've got to get going, but just a quick  
24 response. With regard to diesel powertrain technology,  
25 the automakers aren't looking just -- I mean, aren't

1 looking at America, in particular, they're looking at  
2 California because California is statistically speaking  
3 the number one market in America for light-duty diesel  
4 passenger vehicles, it's the number two market in America  
5 for diesel pick-up trucks and SUVs, and so it isn't just  
6 an American problem, this isn't a problem unique to  
7 California --

8 VICE CHAIR BOYD: No, I'll strike "American" and  
9 insert "Californian" in and still make the same comment,  
10 but appreciate that.

11 MR. FULKS: Thank you.

12 MR. WENG-GUTIERREZ: And if I might just make a  
13 quick comment, thank you for those comments, I think to a  
14 certain extent I agree about the incremental cost  
15 comment, I certainly didn't mean to represent that the  
16 hybrid vehicles have the lowest incremental costs of all  
17 the technologies because you're right. But I did also  
18 want to state that the numbers and the values that we  
19 have in our forecasts are derived from a survey and we  
20 have had previous workshops where we talked about the  
21 methodologies. That survey obviously is a snapshot in  
22 time of consumer preferences at the time of the survey,  
23 and we do update those over time. So, as you said, you  
24 know, there's been a new slew of diesel technology  
25 vehicles that are entering the marketplace, consumers

1 will be adopting those and becoming informed about the  
2 technology, and that would then influence what we see in  
3 our surveys as their response to those. So I would  
4 anticipate that, as we revise or go out for another  
5 survey and collect that information, that we will see  
6 changes in these numbers based on the current set of  
7 preferences and offerings in the marketplace and  
8 consumers' knowledge of those technologies. So today  
9 this is what we're using because that's what we had in  
10 our previous survey which, again, was from I think 2009.  
11 We are updating that and hopefully it will change those  
12 numbers slightly.

13 MR. FULKS: Well, I appreciate that. The last  
14 workshop we were here, we thought your numbers were wrong  
15 then and we think they're wrong now. And what we'd also  
16 suggest is that consumer surveys, as far as we're  
17 concerned, are not necessarily a good indicator of what  
18 the people are actually going to do when they get to a  
19 dealer showroom. The hand raisers are quite significant  
20 from the check writers.

21 MR. WENG-GUTIERREZ: So, and just to go to Jim's  
22 point, was we, staff, would certainly be interested in  
23 any information you can provide to us about our near term  
24 technology adoption rates, as well as any information you  
25 have on that to better our estimates. So, thank you so



1 much.

2 MR. SHEARS: Good afternoon, Commissioner Boyd and  
3 staff. First, thanks again for the incredible work,  
4 Gordon, Malachi, Gary, et al. My name is John Shears,  
5 I'm with the Center for Energy Efficiency and Renewable  
6 Technologies. And I'm sorry if this was covered earlier.  
7 I tried to call in while I was in transit and the system  
8 wouldn't accept my access code.

9 VICE CHAIR BOYD: The system works! Sorry, John.  
10 It's been a very quiet afternoon.

11 MR. SHEARS: So I just wanted to clarify, on  
12 Slide 32 with these incremental costs matrix, basically  
13 this is a static matrix that's not attributable to any  
14 particular time point in the Transportation Demand  
15 Forecast? Am I correct? This is basically just trying  
16 to cover a possible range of incremental costs?

17 MR. WENG-GUTIERREZ: Right. I think it was just  
18 a representation of potential cost variance, and really  
19 in no timeframe. And, as I said before, you know, these  
20 would vary over time, you wouldn't even have a single  
21 cost --

22 MR. SHEARS: Okay, so with respect to that, I'm  
23 just wondering if, as part of the associated discussion  
24 going forward in any draft reports if there will be an  
25 attempt to relate this to, you know, the incremental cost

1 curves that are part of the analysis vis a vis the DOE or  
2 any of the more prominent academic research analyses such  
3 as at MIT, etc.?

4 MR. WENG-GUTIERREZ: Right. Well, again, as  
5 before, we are kind of limited by time, but we have taken  
6 a look at those technology curves and I think we plan on  
7 having a couple scenarios where we run with different  
8 cost curves for the technologies. Right now, I think  
9 we're kind of in the middle of the range of values, but  
10 we did want to do a couple of scenarios or cases where we  
11 are looking at lower costs for technologies, as well as  
12 maybe higher estimates.

13 MR. SHEARS: Right and that would also include  
14 the US EPA and that's --

15 MR. WENG-GUTIERREZ: Exactly.

16 MR. SHEARS: -- Technical Assessment Report. I'm  
17 also wondering if staff is planning on doing any kind of  
18 analysis with respect to cost of ownership issues. Right  
19 now, this is like all about upfront costs and, you know,  
20 granted, both plug-in technology and fuel cell vehicle  
21 technology and their associated infrastructure, etc., you  
22 know, both pose their challenges and costs, but I'm also  
23 curious as to whether the Energy Commission will be  
24 looking at cost of ownership issues because, for some of  
25 these technologies -- and, again, it will change as we

1 move into the future and have a market success or not --  
2 there is a potential win in here for consumers that may  
3 not be reflected in terms of the upfront capital  
4 investments required.

5 MR. WENG-GUTIERREZ: Absolutely and I think as  
6 part of the adoption, the parameter that is used really  
7 is operating cost as opposed to upfront purchase price  
8 cost. I mean, the new vehicle price is in there, but we  
9 also consider that operating costs and things as an  
10 influence to the option, but I certainly agree the cost  
11 of ownership, say, for a five-year period, to represent  
12 across technologies what that might be, that would be  
13 interesting to look at.

14 MR. SHEARS: Yeah, because there are analyses out  
15 there that are looking at, as we move up to the 2025,  
16 2030 window, granted, you know, subject to assumptions,  
17 etc., but they all will be coming to similar types of  
18 conclusions about the benefits in terms of total cost of  
19 ownership on some of these advanced vehicle pathways. So  
20 I just wanted to highlight that.

21 MR. WENG-GUTIERREZ: Thank you.

22 MR. SHEARS: Thanks.

23 VICE CHAIR BOYD: Before you get your second bite  
24 at the apple, Gina, there were people on the phone.  
25 Maybe we should...

1           MR. MUI: Hello? This is Simon Mui with Natural  
2 Resources Defense Council. Can folks hear me?

3           VICE CHAIR BOYD: Yes, hear you well, Simon.

4           MR. MUI: Certainly, thank you all for presenting  
5 this information today and I wanted to find out first  
6 whether a copy would be available online. It's a little  
7 bit hard to go through all of these sites and digest it  
8 in that 10-15 minute presentation. I think each of us  
9 could probably spend half a day on each of these Slides,  
10 but is there going to be a version published on the Web?

11          MS. STRECKER: Hi, this is Gene Strecker. We're  
12 trying to get those posted online right now.

13          MR. MUI: Okay, great.

14          MS. STRECKER: If we can send out, I'll have our  
15 WebEx folks send out an email when we find out they're  
16 available.

17          MR. MUI: Okay, thank you. So I had a number of  
18 questions, but I'll start with the question about the  
19 hybrid adoption rate and I'm not remembering which Slide  
20 number that was. The issue that I wanted to flag -- and  
21 I second sort of Tom Fulks' comment a bit on the cost of  
22 compliance under the Federal and California Standards on  
23 the GHG side -- that you will have the lower cost  
24 technology essentially being the advanced direct  
25 injection with Turbo charging for gasoline vehicles being

1 the lowest cost. I would ask that there might need to be  
2 some alignment here between these cost estimates and  
3 what's happening Federally between DOE, EPA, NITSA, as  
4 well as Air Resources Board, which have been basically  
5 taking the best available -- not just the best available  
6 data, but also running pretty significant vehicle  
7 simulation and cost modeling, in addition to teardown  
8 studies, so specific tearing down of each component and  
9 costing those out for the different technologies. So I  
10 would really point to that as being the primary and best  
11 source currently available for these cost estimates.

12 In terms of hybrid adoption rates, you know, I  
13 just want to stress that the current Standards being  
14 proposed by Obama as per the National Standards are  
15 really going to drive those numbers significantly  
16 upwards. And I don't know if this matches or not, but  
17 basically in order to achieve compliance, the analysis is  
18 of anywhere from 25 to 65 percent hybridization of new  
19 sales by 2025, and I don't know if that's captured or not  
20 here?

21 MR. WENG-GUTIERREZ: That was -- you said 25 to  
22 65 percent by 2025, and that's of new vehicle sales? Is  
23 that what you're saying?

24 MR. MUI: Yes.

25 MR. WENG-GUTIERREZ: I would have to look

1 specifically at it, but by 2025, we could be close to  
2 that, we could be approaching that. Again, these are  
3 fairly substantial increases in the rate of adoption than  
4 we've seen historically.

5 MR. MUI: Yeah and we've been also looking,  
6 spending quite a bit of time looking at hybrid adoption  
7 rates and one of the key differences, I think, from the  
8 past is that you essentially had true to form five  
9 different models being offered. And what you're seeing  
10 now is actually a lot of these fuel efficient  
11 technologies being standardized by automakers, so it  
12 would be including the gasoline, advanced gasoline, and  
13 diesel technologies as part of meeting those standards.  
14 So I would kind of point to that being a fundamental  
15 difference, but I'll plan on sending you data around this  
16 adoption rate, around rapid adoption potential, as well,  
17 for other technologies. I think data from *Global Insight*  
18 could be useful for CEC to look at this.

19 You know, my final question/point was the  
20 electric vehicle forecast, I'm just wondering, you know,  
21 ARB's current proposal which they're actually announcing  
22 tomorrow, or rather this -- sorry -- December 9th as part  
23 of their regulatory approach, will be about -- I believe  
24 it's 1.4 million ZEVs by 2025, and I don't know where, if  
25 this electric line or plug-in line, kind of -- I'm not

1     sure what this is representing here on Slide 15?

2                 MR. WENG-GUTIERREZ:   So our EV -- regarding the  
3     ZEV program, I think they are going to be talking about  
4     it tomorrow, but the projections that we had in the other  
5     slide actually coincide with the ZEV Program adoption  
6     rates for the BEVs.   The PHEVs that we have, which would  
7     be corresponding to the new T-ZEV category exceed what  
8     ARB is projecting in theirs in these estimates.   And we  
9     haven't included the fuel cell vehicle component to it,  
10    so that is something that is absent from our analyses  
11    only because we didn't ask those types of adoption  
12    questions in our surveys, and so therefore they're not  
13    incorporated into our models.   So to the extent that we  
14    can, I think the forecasts that we have complies with the  
15    ZEV program at their rate of adoption and the vehicle,  
16    the cumulative vehicle populations, certainly for our low  
17    petroleum demand case.

18                Now, I think in one case, in our other case where  
19    we have high petroleum demand, the BEVs did not meet the  
20    ZEV program, and that was part of us thinking that it  
21    might be reasonable to include a case under which the  
22    conditions would lead to a lower population adoption.  
23    Certainly for the PHEVs, again, in both the high and low,  
24    the adoption rate exceeds what is in the ZEV Program, but  
25    I think we do fall short slightly in the BEV category on

1 our low petroleum demand case where -- or, I'm sorry, the  
2 high petroleum demand case -- where we have very low  
3 prices for liquid fuels.

4 MR. MUI: Yeah, but again, the cumulative number  
5 for ZEV was 1.4 million between 2017 and 2025 and I'm not  
6 sure if this is matching that, but it would be good to  
7 follow-up on that issue.

8 MR. WENG-GUTIERREZ: So, again, I was in direct  
9 contact with ARB and they provided me with the numbers,  
10 which I then made sure that we met, and so that's why I'm  
11 saying I'm pretty comfortable with the numbers that are  
12 in here for the low petroleum demand case where we do  
13 comply with the ZEV program, with the exception of the  
14 fuel cell vehicles, which are not incorporated into the  
15 forecast.

16 MR. MUI: Okay. That's helpful. I might have to  
17 stare at this for a while to understand it. The one  
18 thing I do want to stress, too, is a lot of the consumer  
19 -- the costs that consumers will face for vehicles will  
20 be affected by the Standards, including not just the ZEV  
21 Program, but the GHG program, as well. So, for EVs, for  
22 instance, as you know, there's a multiplier as well as a  
23 zero gram treatment for electric vehicles within those  
24 standards. For better or for worse, that ends up being  
25 an internal subsidization within those programs. You



1 know, our estimates of those values could range from  
2 \$8,000 to \$10,000 of internal subsidization for those  
3 vehicles. So if the automaker finds that benefit there  
4 and passes on those costs to consumers, or those benefits  
5 to consumers, you know, you may really see differences in  
6 how the pricing mechanisms for EVs occurs and so you'll  
7 see similar things, right, for the flex fuel vehicle  
8 historically, the crediting for that really driving  
9 automakers to offer those. And the same way the  
10 multipliers, together with the zero upstream, likely the  
11 \$8,000 to \$10,000, as much as that going forward, has an  
12 internal subsidization. So that is a critical, I think,  
13 piece here that could significantly affect the consumer  
14 impact in the same way that the tax credits do.

15 MR. WENG-GUTIERREZ: Sure, great. Thank you for  
16 that comment. I certainly looked at the crediting system  
17 in the ZEV Program and I can look at it again with an eye  
18 towards how to incorporate those benefits as potential --

19 MR. MUI: Yeah, it's not -- yeah, the ZEV is one  
20 of those, right? So that's one [quote] "impact" on the  
21 cost of the vehicles, but also the GHG program  
22 specifically talking about the incentives that were put  
23 in for better or for worse, in being proposed for the  
24 Standards will have a significant significant impact on  
25 the cost, what the consumers see in terms of the cost

1    there.  So I again urge you to look at that portion and  
2    I'm happy to send estimates your way, as well.  Thank  
3    you.

4               MR. WENG-GUTIERREZ:  That would be appreciated,  
5    thank you.

6               MR. YOWELL:  Eileen Tutt.

7               MS. TUTT:  Thanks, everyone.  Can you hear me  
8    okay?

9               MR. YOWELL:  Yes.

10              MS. TUTT:  Okay.  So this is Eileen Tutt with the  
11    California Electric Transportation Coalition.  And most  
12    of my questions have been answered, but I really want to  
13    emphasize what Simon just said because what we're talking  
14    about is an internalized subsidy that has real cash value  
15    and that's particularly true of battery electric vehicles  
16    because, whether you believe it, or like it or not, the  
17    Federal program provides -- does not count the upstream  
18    emissions associated with those vehicles and they get  
19    zero credits for meeting the Standards.  So that's not  
20    just -- that subsidy has a real cash value and I agree  
21    with Simon and I hope that you use their numbers, or  
22    something like that when you look at what the real cost  
23    of particularly pure battery electrics, but also plug-in  
24    electric battery vehicles, will be.  So there's that, and  
25    it is a little bit of -- it is an internal subsidy.

1    Anyway, I want to support Simon. But I also wanted to  
2    ask you two questions, 1) in the incremental cost slide,  
3    are those incremental relative to the costs associated  
4    with gasoline vehicles that have to meet the LEV3  
5    Standards out in the timeframe, you know, the 2016 to  
6    2030 market? Or are those -- I mean, when you say  
7    "incremental costs," does that account for the fact that  
8    gasoline vehicles are also going to be more expensive in  
9    these out years? That's my first question.

10           MR. YOWELL: Well, Malachi, these are the values  
11    straight from the IEPR 2011 forecasts and from K.G.  
12    Duleep, are they not including historical future  
13    requirements?

14           MR. WENG-GUTIERREZ: Yeah. If these are basic on  
15    the inputs to the model, which we get from our  
16    contractor, K.H. Duleep [sic], then they do incorporate  
17    the technology costs, as well as the adoption of the  
18    future technologies for the gasoline counterparts to the  
19    alternative fuel vehicles, yes.

20           MS. TUTT: Okay, so they take into account LEV3,  
21    which hasn't yet been adopted, but...?

22           MR. WENG-GUTIERREZ: Yes.

23           MS. TUTT: And that's all I wanted to know.  
24    Then, the second question, I wanted to again just  
25    reiterate what Bill Boyce from SMUD said about Level 1

1 charging because what we're seeing in the marketplace  
2 today is that about 40 percent of PHEV and BEV owners are  
3 using level 1 charging, and that -- the cost obviously is  
4 zero in terms of home upgrades, and then just being out  
5 there working with stakeholders and employers, it looks  
6 like that, the level 1 charging, could very well be an  
7 incredibly attractive option for, you know, destination  
8 places like Disneyland or something, but also for  
9 workplace charging where you are parked for, you know,  
10 somewhere on the order of eight to 12 hours. And so I  
11 don't -- I don't know where these numbers come from for  
12 the infrastructure electric vehicles, but they clearly  
13 don't take into account -- it looks to me, anyway, like  
14 not only are they high for level 2 charging in the home,  
15 but especially given the advancements that are being made  
16 in that market and the amount of competition that's  
17 taking place in the infrastructure market, but they don't  
18 seem to account for any level 1 charging, which certainly  
19 doesn't reflect our early experiences thus far, and I  
20 would like to see some consideration for -- I think these  
21 costs are too high even for level 2, but if you could  
22 consider perhaps even a 20 percent level 1 charging,  
23 particularly for PHEVs, I think that would be very fair,  
24 extremely conservative, very fair, and that would bring  
25 the costs down quite considerably.

1 MR. YOWELL: That sounds great.

2 MS. TUTT: Thank you.

3 VICE CHAIR BOYD: Anyone else on the phone?

4 Thank you, Simon and Eileen, for your comments.

5 MR. YOWELL: Scott Richman, are you there?

6 Scott?

7 MR. RICHMAN: Yes, can you hear me?

8 MR. YOWELL: Yes.

9 MR. RICHMAN: Okay, thank you. I just wanted to  
10 see if the presenters could put up the slide showing the  
11 number of E85 stations that are forecast for 2020 and  
12 2030 again. Thanks. If you could just leave that up for  
13 just a moment, that would be great. All I wanted to do  
14 is see the numbers. That was my entire question.

15 MR. YOWELL: Okay. Max Baumhefner. Max, are you  
16 there?

17 MR. BAUMHEFNER: Yes. Can you hear me?

18 MR. YOWELL: Yes, beautiful.

19 MR. BAUMHEFNER: Great. Thank you. Following on  
20 some questions that Eileen and Bill and Simon both asked,  
21 I might suggest a reframing of the categorization of  
22 vehicles for here, as I think the public perception of  
23 this report will be that the California Energy Commission  
24 thinks electric vehicles, in general, have a very dismal  
25 future, and that's partially because they're not -- plug-

1 in hybrids aren't included in the category of electric  
2 vehicles. So I think your report probably should specify  
3 battery electric vehicles, then plug-in hybrid vehicles.  
4 And you likely can consider forecasts that include both  
5 since it is still very much an open question as to what  
6 levels of penetration for the two technologies will be.

7 Speaking specifically about battery electric  
8 vehicles, forecasts of three-tenths of one percent market  
9 penetration in 2030, I think, will similarly be perceived  
10 as the California Energy Commission stating that battery  
11 electric vehicles have a very dismal future. And we, in  
12 previous written comments, asked for the assumptions that  
13 went into this consumer choice model, which reflected an  
14 overwhelming choice or bias against pure battery  
15 electrics, and we would like to reiterate that request  
16 here.

17 Also in our previous written comments we noted  
18 that the -- I think Slide 16 shows consumer demand for  
19 battery electric vehicles actually decreasing in or  
20 around the 2020 time frame, which I believe staff had  
21 identified in the previous workshop as an anomaly in the  
22 model that needed to be fixed; but I looked at Slide 16  
23 in passing and it looks like that anomaly still hasn't  
24 been fixed.

25 Then, as it relates to the incremental costs

1 question, I think it's similarly misleading to show the  
2 *Tesla Roadster*, which as Commissioner Boyd points out, is  
3 a vehicle that isn't going to be made in the future, for  
4 a projection of future costs and that, even if it was  
5 included, should be compared to a *Lotus*, which it shares  
6 a platform with, not an average of sports cars which  
7 includes a lot of *Mazda Miatas*.

8           And then I would just echo what both Eileen and  
9 Bill said about the incremental costs of level 2 charging  
10 going down; it seems like every month there's a new  
11 announcement about those costs climbing rapidly and also  
12 about the consumer -- sizeable consumer population opting  
13 for level 1 charging, which has no incremental costs.  
14 And I'd also kind of potentially question the assumption  
15 that you're going to be comparing home charging  
16 infrastructure to gasoline stations in terms of the cost  
17 on a per gallon equivalent basis, when by definition home  
18 charging installations will only service a couple  
19 vehicles, which is part of the beauty of them, and part  
20 of the way people will choose these, because of the  
21 convenience of not having to go to the gas station in the  
22 first place.

23           MR. WENG-GUTIERREZ: So this is Malachi Weng-  
24 Gutierrez again, just wanted to comment on a couple of  
25 the things you had mentioned. I would be happy to

1 provide you with some of the information that went into  
2 our forecasts and, if you could contact me, I could --  
3 I'll look at providing you that information. My contact  
4 information is at the end of this slide set.

5           As far as the incremental cost goes, you had  
6 mentioned that the Tesla is obviously the large  
7 incremental price difference there because it is being  
8 compared to other non-kind of high end vehicles, and that  
9 was exactly the point that I was trying to make when I  
10 presented that slide, was that it's not really  
11 appropriate to look at that as a representative  
12 incremental cost. And I think you were just making the  
13 same comment. I think it's difficult to look at  
14 incremental costs, in general, when you have a new  
15 technology coming into the marketplace and it's a single  
16 vehicle, or two vehicles, and then you start comparing it  
17 to a whole market, or to select vehicles. You do have to  
18 be cautious about that. So, a point taken.

19           And then, Gary, if you want to comment on the  
20 home recharging incremental cost comment, or comparison?

21           MR. YOWELL: Yeah, I could briefly talk about  
22 that. That's, as we're looking at a policy perspective,  
23 where do we as a State Government get its results from?  
24 So it's a fair game to compare all options, it's not that  
25 the gasoline or diesel is an option in the context of the



1 renewable fuel for the -- as an RFS compliance issue,  
2 except for the renewable components, but it's more of a  
3 ground truth testing to see where things are over the  
4 overall spectrum of technologies. But policy-wise, we'll  
5 be considering all these options and let the chips fall  
6 where they may.

7 MR. BAUMHEFNER: My question, my recollection  
8 that the Slide 16 which shows a decrease in demand for  
9 battery electric vehicles in the year 2020 or so was an  
10 anomaly?

11 MR. WENG-GUTIERREZ: Right, sorry about that,  
12 yeah, I did mean to address that, as well. So again,  
13 that's a product of the inputs. I wanted to make sure  
14 that what we were hitting was the ZEV program and the  
15 timeframe that I had values for, and then post that  
16 timeframe which was the 2025 timeframe. I left the  
17 vehicle information in there kind of constant, and so it  
18 could very well just be a product of the changing  
19 competitiveness of the market, given other values that  
20 are changing. So I can take a closer look at that and if  
21 you have some -- after having looked at some of the  
22 inputs, maybe if you have some suggestions, I can look at  
23 how to incorporate them.

24 MR. BAUMHEFNER: I appreciate that and appreciate  
25 all the work that you've put into this, I know there's a

1 lot of analysis that has to go into looking at such a  
2 broad spectrum of technologies.

3 MR. WENG-GUTIERREZ: Thanks.

4 MR. YOWELL: Are we done?

5 MR. BAUMHEFNER: Yeah, that's good for me. Thank  
6 you.

7 MR. YOWELL: Thank you. Is Tyson on the line?

8 MR. ECKERLE: Yeah, I'm here. Can you hear me?

9 MR. YOWELL: Yes.

10 MR. ECKERLE: Okay, great. This is Tyson Eckerle  
11 with Energy Independence Now. I just wanted to ask some  
12 questions about the hydrogen costs; they seem to be on  
13 the higher side to me, so I just wanted to ask you if you  
14 could review the costs and I would love to see the data  
15 you used to arrive at the conclusions you made about the  
16 vehicles and also the infrastructure.

17 MR. YOWELL: The infrastructure is specifically  
18 from our 11 fuel cell projects that we've funded through  
19 our program, so those are actual costs, average costs of  
20 the stations that we've funded at the capacity that it  
21 shows right there on the slide. So those are pretty  
22 firm.

23 MR. ECKERLE: Oh, yeah. Okay. I guess more in  
24 the vehicle costs, as well, so, you know, the \$50,000 to  
25 \$100,000.

1           MR. YOWELL: The jury is out on that cost. We  
2 put a scenario price out because we've got no good  
3 confidence of what value should be chosen at this moment,  
4 so at prior workshops industry has come to us and  
5 explained that the precious metal loading on the  
6 Mitsubishi was \$180,000 just for that component, not to  
7 mention the other 90 percent of the car, so it's hard to  
8 judge what the final retail price will be when the costs  
9 are at pretty high levels. Malachi?

10           MR. WENG-GUTIERREZ: Yeah. And this is Malachi  
11 again. I just wanted to make one quick comment about the  
12 hydrogen values. It is something, again, that we haven't  
13 incorporated into our forecasts in the past, we are  
14 looking to do that in the future, and so we will be  
15 taking a closer look at the incremental costs and the  
16 technologies that would be needed, and all those elements  
17 in future IEPRs. And so, again, I mean hopefully we'll  
18 have better answers in the future.

19           MR. MUI: This is Simon.

20           MR. YOWELL: Yes.

21           MR. MUI: -- fuel cell vehicle costs, you know,  
22 with volume and comparing the different studies that have  
23 been done and automaker estimates were included in that,  
24 so that might be a good starting point to kind of get  
25 your incremental costs. So I think that you're right,

1    that the first vehicle will be pretty darn expensive, but  
2    you know, I don't think automakers would be investing in  
3    their plans if they thought the vehicle was going to cost  
4    \$50,000 or \$100,000 forever.

5           MR. YOWELL:   What was that source you were  
6    mentioning?

7           MR. MUI:    International Council on Clean  
8    Transportation, Alan Lloyd's group that did a study on  
9    both fuel cells and battery electric vehicles.

10          MR. YOWELL:   Thank you.

11          MR. WENG-GUTIERREZ:   Actually, I just -- this is  
12    Malachi again -- just one quick comment also on the fuel  
13    cell vehicles again.   In our modeling and in our forecast  
14    work, we don't use incremental costs as the basis of any  
15    of the choice, we use the real new vehicle prices  
16    disaggregated by class, and so what we were bringing  
17    today as far as the incremental costs of the new vehicles  
18    were just kind of to represent the range of values for  
19    those situations where we had them.   For the fuel cells,  
20    obviously, those are just -- it is a set of numbers to  
21    represent potential incremental costs.   So I just wanted  
22    to put that out there and make sure that people  
23    understood that these aren't necessarily the bases of our  
24    forecasts.

25          MR. MUI:    Thanks, Malachi.

1 MR. WENG-GUTIERREZ: Sure.

2 MR. YOWELL: Are we --

3 VICE CHAIR BOYD: Okay, Gina, you --

4 MS. GREY: Gina Grey, Western States Petroleum  
5 Association. Just a quick reminder of the three-legged  
6 stool and, since the Commission is the watchdog of energy  
7 supply in the state, would like to request that at some  
8 point in the IEPR, there be a blending together of the  
9 vehicle, the fuel, and the consumer issues so that we  
10 actually get to see what you think the forecast for the  
11 State is, and whether there are any concerns or problems  
12 that you feel may be cropping up because, while we're  
13 looking here at, say, vehicle and the infrastructure, and  
14 that scenario, it's not clear to me, anyway, whether or  
15 not when you overlay the LCFS, the RFS2, any of the fuel  
16 components, and obviously the consumer we have identified  
17 already as the big unknown, but at least the two  
18 components of the stool would be good to have some kind  
19 of a blending of those two so that the Commission can  
20 actually say whether for the future you feel we're headed  
21 towards some choppy waters. Thank you.

22 MR. HEIRIGS: Hi. I'm Phil Heirigs with Chevron.  
23 Just a real quick, I think, clarification question. On  
24 the alternative fuel vehicle incremental cost, you've got  
25 a negative value for FFVs. I assume that's the credit

1 for café -- the café credit on that?

2 MR. YOWELL: Malachi?

3 MR. WENG-GUTIERREZ: I would have to look at it  
4 specifically. I didn't put this table together, so I  
5 would have to look into why there is a negative value  
6 there, but it could very well -- I don't think that we  
7 incorporated the café credit values in there. I thought  
8 we had specifically asked that they be excluded from the  
9 estimates that we were providing, so that's not the real  
10 retail price.

11 MR. HEIRIGS: Typically it's \$100 to \$150 for  
12 FFVs, this is a negative thousand, so I was assuming it  
13 was the café credit rolled in there some way.

14 MR. WENG-GUTIERREZ: It should not be, no. So I  
15 do need to look at what that is.

16 MR. HEIRIGS: Great, thanks.

17 MR. YOWELL: Okay, I think we're done.

18 VICE CHAIR BOYD: Time to move on.

19 MR. PAGE: I think we can move on to our second  
20 presenter.

21 MR. SCHREMP: Good afternoon, everybody. My name  
22 is Gordon Schrempp. I'm the Senior Fuels Specialist in  
23 the Fossil Fuels Office in the Transportation Fuels  
24 Division, senior in knowledge and now senior in age, I'm  
25 getting up there by any measure of AARP advertisements

1 sent to my home.

2           So glad we're going to transition to the non-  
3 controversial portion of the presentations, at least we  
4 got that out of the way with the first part here. So I'm  
5 going to be covering in this set of slides what we refer  
6 to as proportional share compliance with the Federal  
7 Standard for the Renewable Fuel Standard, RFS2. And we  
8 -- just a little background -- we do in our forecast, we  
9 have initial forecast for demand for transportation  
10 fuels, as a process we go in there and make sure there is  
11 compliance with the Federal program that we believe  
12 mandates incremental use of renewable fuels. So that's a  
13 post-processing step. And a second element of our  
14 analysis on our forecast is then to look at compliance  
15 with the state program, which would be the Low Carbon  
16 Fuel Standard. So back on September 9th, we talked about  
17 this proportional share analysis and how it essentially  
18 pushes out some additional gasoline and increases the  
19 amount of ethanol that we talk about in the form of  
20 increased E85 demand.

21           So we went back and we took a look at what we  
22 were assuming would be the amount of fuels under this  
23 federal standard, and we believe that the amount of fuels  
24 we were using, meaning the Congressional target values  
25 for things like cellulosic fuels and other advanced

1 categories, are too high based on what's been going on.  
2 So this slide is to address that issue specifically and  
3 how we've modified what we did back in September, and  
4 what the consequence of those modifications are.

5           So once again, it's a proportional share. We do  
6 recognize that renewable identification number credits  
7 are going to be used by companies and they sell products  
8 throughout the United States, a disproportionate amount  
9 in various states in their various market territories,  
10 but for all intents and purposes, in our analysis we  
11 assume all of the volume of fuels here is going to meet  
12 this proportional share in California with no use  
13 credits.

14           E10 is another important element of this and  
15 there is a current cap in California of E10. There can  
16 be modifications to those regulations over time that  
17 would be spearheaded over time by the California Air  
18 Resources Board, it is their fuel regulation. So they  
19 would need to take information to see what changes would  
20 be necessary to their fuel formulation and modeling work  
21 through vehicle testing and things like that, so this is  
22 a multi-year process. But for purposes of our forecasts  
23 in the separate cycle, we're assuming an E10 cap  
24 throughout the forecast period where you recognize that,  
25 if there is an E15 level allowed to be used in the



1 assumption, then the amount of E85 we're showing here  
2 would not be as great as it would be otherwise.

3           So this is just a higher level of what RFS2 is  
4 sort of in contrast to LCFS, where the Low Carbon Fuel  
5 Standard, so this is a mandate and there are target  
6 volumes. It's not a per gallon regulation that the Low  
7 Carbon Fuel Standard can be interpreted to be. And we're  
8 looking at impacts on fuel availability of ethanol, this  
9 is corn, this is displacement of gasoline from our  
10 initial forecast, and you do need an infrastructure for  
11 these kinds of renewable fuels.

12           So this is the -- I guess I would say the  
13 modified original table, the red numbers being the  
14 changes US EPA has made so far. They are going to soon  
15 rule or issue in the Federal Register what their decision  
16 is for 2012, next year, that would be in the cellulosic  
17 category here. So it will be 3.5 up to 12.6 million  
18 gallons, or anywhere in between. And they may or may not  
19 adjust the other advance; we'll see how that goes.

20           So, as one can see from this chart, the original  
21 strikethrough numbers, 500 million gallons for 2012, is  
22 going to be significantly downsized. And the  
23 anticipation -- well, anticipation where 2013 is a  
24 similar large reduction in the original levels. So we've  
25 seen reductions anywhere from 95 to 98 percent so far, so

1 clearly there is an issue with a lack of progress for  
2 cellulosic production capacity in the United States. The  
3 issue -- there is probably lots of factors, most  
4 primarily is likely the higher cost of production for  
5 this kind of technology and struggling to compete in an  
6 environment of relatively low price ethanol from the  
7 traditional sorts such as corn. So it is a challenge and  
8 progress is not being, so technical staff would have to  
9 agree with what EIA, Energy Information Administration,  
10 has done and when they have a projection of cellulosic  
11 fuel availability, as well as other advanced fuel  
12 availability, those numbers are lower than these volumes  
13 on this slide, that amount of 36 billion gallons by 2030,  
14 or actually be -- excuse me, by 2020. So let's move on.

15           These are the original values. You see the  
16 dependence on cellulosic ethanol starts to become quite  
17 great, and actually that, I believe, a misnomer, that  
18 should be cellulosic biofuels because -- and I'll talk  
19 about that in just a minute -- so we look at what the  
20 total targets are and we look at California's  
21 proportional share which is essentially between around,  
22 say, 10 percent, that's what it's been historically.

23           So taking EIA's new projections, we've  
24 constructed these modified tables and the takeaway is  
25 that you're no longer by 2030 up to 36 billion gallons in

1 total, you're no longer at 16 billion gallons here for  
2 cellulosic biofuels, and you're certainly no longer at  
3 four billion for other advanced, which would be things  
4 like Brazilian sugarcane ethanol. You're close in that  
5 category. So at the very top, you'll notice that this is  
6 for the low petroleum demand, which infers high petroleum  
7 fuel prices, and this is the closest policy case in the  
8 EIA's projections for 2011 and their accompanying  
9 cellulosic projections, so that's why we're pairing this  
10 case with our low demand scenario.

11           So when you graph these together, you'll see that  
12 the cellulosic biofuels is actually three components,  
13 cellulosic gasoline, diesel, and ethanol. And we will  
14 intermittently refer to cellulosic gas and diesel as BTL  
15 or Biomass To Liquid fuels, so BTL Gas and BTL Diesel,  
16 you'll see that in some of the other slides we'll put up.  
17 But the red line is sort of -- that's the original  
18 mandate level and you can see that these stacked bars  
19 fall short of that, so this is sort of high prices, low  
20 demand projection for EIA. Similarly, we have a high  
21 demand case which is low petroleum prices, and the same  
22 thing, we're just laying out all these numbers so  
23 everyone can see them, exactly what the numbers were that  
24 we used for the national supply availability of these  
25 fuels. And being lower prices, EIA is projecting lower

1 quantities of these fuels produced because of the  
2 comparative values of other renewable fuels that are  
3 competing against are lower, so there's less produced in  
4 this case.

5 Put them altogether, we show the total volumes  
6 available in the United States and we're assuming  
7 California is going to be using their proportional share  
8 of these relative volumes. That's cellulosic ethanol,  
9 gasoline, and diesel fuel. And this is important  
10 because, in compliance under the Low Carbon Fuel  
11 Standard, cellulosic or drop-in fuels are actually  
12 replacing things like gasoline have a carbon deficit and  
13 providing a carbon benefit, or carbon credit. So these  
14 are very beneficial fuels in terms of helping to comply  
15 with LCFS, however, as we'll show a bit later, quite a  
16 bit more expensive in our projections.

17 So now, previously we showed that because of  
18 RFS2, the amount of ethanol is going to increase in  
19 California, it's already jumped up in 2010 as the market  
20 transitioned to an E10, but after a couple of years, it's  
21 showing a rather rapid increase; that was our previous  
22 assessment based on proportional share with RFS2. We  
23 changed the assumptions and we changed our projections,  
24 so now it's lower. You really only get to three billion  
25 gallons of total ethanol under our Low Demand Scenario,

1 and so what's happening is you basically flattened out  
2 our projection for increased ethanol use, you've put off  
3 the time that a greater amount of ethanol is going to be  
4 needed for RFS2 proportional share compliance. It  
5 doesn't mean that more ethanol can't be used by market  
6 participants if it remains at a relatively low value, and  
7 is attractive for things like E85. But we'll get to that  
8 in a minute.

9           So when we use more ethanol than the initial  
10 demand forecast and have an E10 cap, moving forward you  
11 will decrease your E10, which is what we call a Gasoline  
12 Forecast here, and you will increase your E85 from our  
13 business-as-usual rather significantly. So this is what  
14 we did back on September 9th, so change the amount of  
15 cellulosic and other advance fuels to make them lower,  
16 the impact is less. So this is the revised forecasts  
17 and, as you see, the gasoline demand is not pushed out as  
18 much in this case, and E85 does not go up as high and is  
19 delayed until the time it deviates essentially from the  
20 business-as-usual pathway.

21           This is for the high petroleum demand, i.e., low  
22 petroleum prices, and then you have -- this is previously  
23 what we were showing, some displacement of E10 and  
24 greatly increased E85, and now a lot less of both, well,  
25 at least about 50 percent less. So this is a rather

1 significant impact and does have an associated impact on  
2 the infrastructure with this, so once again, here's a  
3 closer look at just those E85 volumes, and you'll see  
4 that when we go ahead and apply the newer lower levels,  
5 you flatten out the early next couple of years before you  
6 start having to climb up to help achieve compliance with  
7 RFS2 Proportional Share. So we'll move along.

8           This is just the Flex Fuel Vehicle Forecast and I  
9 think the takeaway from this slide is that there is a  
10 projection, as Malachi was stating earlier, based on  
11 consumer preference. The cost of this vehicle technology  
12 that there's going to be an adequate population in these  
13 vehicles to meet E85 demand projections, up until the  
14 latter part of up around 2020 or 2019. So there is no  
15 near term concern, if you will, with an inadequate FFE  
16 population in California.

17           And then change the assumption about how  
18 frequently an FFE owner fuels their vehicle with E85, 50  
19 percent of the time, or 75 percent of the time, we  
20 certainly don't believe it's 100 percent of the time,  
21 that you'll need a different quantity of vehicles to  
22 consume that amount of E85 in a particular year.

23           So what are the issues with vehicles is, although  
24 we do have a projection at this point, and that, yeah,  
25 that's for the 2011 IEPR based on these preference

1 surveys of estimated vehicle costs, there are concerns  
2 about even that projection itself. There are lots of  
3 regulations that the automobile manufacturers need to  
4 meet in the United States and, in particular, in  
5 California and some of those Standards with the ZEV  
6 standards, whether it's a more aggressive café standard,  
7 may not include in their basket of preferences for  
8 compliance as an automobile manufacturer a whole heck of  
9 a lot of flex fuel vehicles. They may want to look at  
10 other kinds of technologies. So all we're pointing out  
11 is that the forecast, our projections of flex fuel  
12 vehicle availability in California, does have some risk  
13 that the OEMs may start to alter their behavior and  
14 what's offered for sale over time. And, yes, this is a  
15 terribly long projection, and it is -- we take Gina  
16 Grey's comment to heart that looking, assessing this  
17 information on an annual basis seems to be the completely  
18 appropriate thing to do, you know, responsible thing to  
19 do. It's a staff issue, but I think we've been making  
20 modifications to how we house the information, how we  
21 model and assess the information, so I think we are in a  
22 much better position. I don't want to make my Office  
23 Manager nervous, but I think by having a bit more  
24 flexibility and capability to do additional sensitivities  
25 and do them with greater frequency than once every two

1 years, I think it's merited and I think it's something  
2 we're capable of doing. So, point well taken.

3           So I'll just move on to the dispensers. I think  
4 Gary was showing some dispensers and kind of where  
5 California is at currently, that's sort of a business-as-  
6 usual case down here in the red line. And then,  
7 depending on the volume of E85 we're projecting, and how  
8 much a typical dispenser is shelling out each year of  
9 E85, you get widely different variations in the numbered  
10 dispensers required. And so this is just to show you  
11 previously we had things down here in the lower 5,000 by  
12 2022, upwards of over 35,000. And, yeah, there's 10,000  
13 service stations in California and there's probably  
14 around 45,000 dispensers, so that would be a lot relative  
15 to today, E85.

16           So revising our assumptions and approach, we  
17 essentially push down the near term E85 dispenser need  
18 and push off into the future, and even the very highest  
19 is upwards of 30,000. But down here, you're seeing by  
20 2020 some more grouping below 10,000. So this has an  
21 impact on the cost and the infrastructure questions that  
22 came up, you know, what kind of availability you need and  
23 what does that cost, and who is paying for that over  
24 time. So those are very good questions, but changing the  
25 amount of RFS2 obligation does push down the amount of



1 E85 we had forecast back on September 9th.

2           So E85 dispensers, like I said, this is some  
3 specifics and we will be providing some files to the  
4 stakeholders that have detail, a lot of the information  
5 we're talking about, and we apologize -- I personally  
6 apologize for not having that, we would have loved to  
7 have that in advance of this workshop, it is a lot of  
8 information, it does require a lot of study and thought  
9 to make more comments, so we apologize for not having  
10 that now, but we want to still get the information out to  
11 people, not just what is in these slides, but actually  
12 get that in the form of spreadsheets. So we are  
13 intending to do that rather soon.

14           So this is just an example by 2022, sort of the  
15 range of dispensers by that time and recognizing there is  
16 already 85 or 100 dispensers out there, and a cost of  
17 \$440 million at I think the lower end, 1,318. And the  
18 cost ranges can be broad, it depends on how sophisticated  
19 or involved a dispenser you want to have, with a canopy,  
20 and -- but the takeaway here is that this is a tough  
21 business decision for a typical service station owner,  
22 which in most cases is an independent business person in  
23 the United States and in California, that is making about  
24 \$40,000 pre-tax profits per year. So you see the  
25 challenge for somebody with that kind of pre-tax profit

1 revenue stream for this kind of an investment would be  
2 difficult to have a bank that is already tight on lending  
3 to say, "Oh, yeah, no problem, here you go."

4           So what is happening now? E85 dispensers have  
5 been putting in the grants, we ourselves even have a  
6 program, and there are some creative marketing  
7 strategies, business models between the purveyors of E85  
8 and an existing service station owner that helped defer  
9 some of the costs. So we recognize that's occurring, but  
10 to transition to a full independent business model where  
11 it makes sense for someone to spend their own money on  
12 this is a bit challenging at this point, from our  
13 perspective.

14           And pricing is very important, recognizing that  
15 E85 -- ethanol has a lower energy content or, i.e. fuel  
16 economy penalty than does gasoline, and so that  
17 difference is 23-28 percent compared to gas that can  
18 contain 10 percent ethanol, and therefore if you have  
19 less expensive ethanol relative to your gasoline, you can  
20 go ahead and market that on a competitive basis to take  
21 account for that fuel economy penalty that the consumers  
22 are well aware of.

23           However, moving forward, and when I talk about  
24 the Low Carbon Fuel Standard, we're looking at biofuel  
25 prices that we believe are going -- or we're looking at

1 an LCFS requirement in conjunction with more expensive  
2 biofuel prices, so we're seeing this necessitating  
3 different ethanol use in California that is more  
4 expensive and we believe that this discounted position  
5 relative to gasoline will go away for many many of the  
6 types of ethanols we're going to see here, Brazilian  
7 sugarcane, even Caribbean Basin Initiative ethanol, but  
8 certainly cellulosic ethanol. So right now, yes, it is  
9 cheap enough relative to gasoline to market with a fuel  
10 economy discount, but that's something that we believe is  
11 at risk moving forward. But just to note that there are  
12 other creative and opportunities and revenue streams  
13 available to purveyors of E85, whether that's RIN credit  
14 values, future LCFS credits that will have positive  
15 economic value to be determined by the marketplace, and  
16 you still can use corn-based ethanol in California -- for  
17 a number of years -- and this is something that certainly  
18 someone selling E85 that will have a certain amount of  
19 LCFS debit for that portion of the gasoline is going to  
20 see a much larger portion of credits. So you can look at  
21 using a different flavor of ethanol as a niche market to  
22 still comply and still be able to find a sufficiently  
23 discounted ethanol for a number of years, at least during  
24 the early portion of the LCFS.

25 So those are my comments on RFS2 and E85 and I

1 would be happy to take any questions from the dais.

2 VICE CHAIR BOYD: I don't have any questions.

3 But I think your point about pricing of E85 to the  
4 consumers is key here. If that doesn't work -- if the  
5 consumer doesn't see they're going to get equal or  
6 greater value, they're not going to be enticed to shift  
7 and California is going to have a tough time meeting its  
8 quota. I appreciate you bringing this out more clearly  
9 than we did in the September workshop. This Commissioner  
10 still remains very skeptical about E85's prospects in  
11 this state, but it is what it is. So not a question, a  
12 statement. Any audience questions? Jay and the  
13 gentleman here from the oil industry.

14 MR. MCKEEMAN: Jay McKeeman, California  
15 Independent Oil Marketers. Gordon, has the Energy  
16 Commission done any surveys of the E85 customers in terms  
17 of their experience with the fuel and their repetition of  
18 use? A common -- and this is very anecdotal, but it's  
19 common enough to catch my attention -- a comment from our  
20 members if that, when they put in an E85 station, they  
21 will get a surge of business at the early point based  
22 upon the low price, but as they recognize the amount of  
23 trips they're going to have to make back to the service  
24 station, they lose convenience, and that's, I think, just  
25 from my very base level of understanding of customer

1 preference, that seems to be a problem with E85. And I  
2 was just wondering if Energy Commission has drilled down  
3 at all on that.

4 MR. SCHREMP: No pun intended on "drilling down,"  
5 but we'll talk about offshore in the next workshop. We  
6 have not conducted a survey of customers, per se, exactly  
7 on this question, and Malachi can step in and correct me;  
8 however, we do have the ability to look at specific  
9 station sales of E85 on a year-to-year basis. This is  
10 through our A15 retail survey analysis; we recognize that  
11 a station can offer E85 for sale for the first time at  
12 some point throughout the calendar year, and that could  
13 be almost a short year for offering sales. And then, so  
14 I think we do have some stations that have been marketing  
15 E85 for more than two years, and so if you get multiple  
16 years, you can at least look at station-to-station comps  
17 and say, well, at least this station is selling. And  
18 some of it could actually be involving the phenomena you  
19 mention, Jay, customers can go in, see that, recognize  
20 FFV, buy it, you know, want to do that, and then  
21 recognize there's a fuel economy penalty, an increased  
22 visitation to service stations which most of us don't  
23 want to do, not that they're not nice, but it's just sort  
24 of a perceived inconvenience thing. So is that customer  
25 doing what you're saying and then being replaced by

1 another one because there's an under-utilization of FFV  
2 vehicles and E85 retail? Don't know the answer to that,  
3 but at least -- I mean, we could do one thing, Jay, is we  
4 could circle back and look at our data from the A15 for  
5 locations with the same locations that have been showing  
6 E85 for multiple years, to make sure we don't include a  
7 short year. And I think, Malachi, you have a comment to  
8 make?

9 MR. WENG-GUTIERREZ: Yeah, I was going to make a  
10 comment. Just on the survey question, we certainly -- we  
11 have included in our previous survey a question about the  
12 conditions under which they would fuel with E85, not  
13 necessarily saying, you know, if you would continue and  
14 that sort of thing, so we haven't captured that, but we  
15 do have a sense of the conditions under which they would  
16 fuel. And then, following on what Gordon was just  
17 mentioning, we have taken a look at that data, the  
18 station data, and excluded those partial years, and then  
19 taken a look at whether or not there's a growth rate on a  
20 per station basis, and it does appear to be obvious there  
21 does appear to be a growth in those stations that offer  
22 it for multiple years and it doesn't seem like it's  
23 plateauing or anything. But that really is -- it's a  
24 small dataset, so obviously given time and more data,  
25 we'll have a better idea about how those stations are

1 working.

2 MR. MCKEEMAN: Thank you.

3 MR. BRAUETIGAM: John Brauetigam with Valero.

4 Two comments, or three, actually, 1) thanks for doing the  
5 forecast showing the EIA projections, it's a lot more  
6 credible than the lofty goals that Congress had, just  
7 based on numbers. I do want to remind you, Valero is one  
8 of the largest ethanol producers in the country, we also  
9 have a Renewable Fuels Division, we've announced publicly  
10 two cellulosic ethanol projects, one in the upper part of  
11 Michigan to make ethanol from woodchips and -- I'm sorry,  
12 the other one isn't cellulosic ethanol, it's a renewable  
13 diesel project from waste grease and animal fat. We  
14 think in some cases the EIA's projections are a little  
15 too high for the non-cellulosic biofuels. From based on  
16 what's announced, we're pretty sure, hopefully, we'll get  
17 about 25 million cellulosic ethanol production if not by  
18 the end of 2012, early 2013. But we don't see where  
19 we're going to have anywhere near 41 or 45 million  
20 gallons each of cellulosic gasoline and cellulosic  
21 diesel, based on what we know from our Renewable Fuels  
22 Division. We agree, the EIA forecasts are doable from a  
23 standpoint of, if you have a certain technology, you put  
24 the plan in, eight to 12 months later the technology is  
25 proven, the second plant of that technology is built, but

1 it doesn't necessarily mean that either the capital is  
2 there, or there's a place to put the product. Until we  
3 figure out the E85 infrastructure cost and an economical  
4 way to do it, we do have some E85 pumps, but not many, at  
5 Valero stations. I just don't see how you get  
6 significantly above 10 percent Ethanol in the U.S.  
7 Gasoline pool, unless you have an economical solution.

8           The other comment was, I know at the previous  
9 IEPR meeting, I pointed out that the EPA issues a  
10 cellulosic waiver, also has the ability to reduce the  
11 advance biofuel requirement and the total renewable fuel  
12 requirement, you said you would look at that as an  
13 alternative case, hopefully. I really think that's going  
14 to happen in the outer years if you look at the amount of  
15 advanced biofuels required, if they don't do that. The  
16 only thing that's out there right now is cellulosic -- I  
17 mean, excuse me, is Brazilian Ethanol. The majority of  
18 the Brazilian Ethanol is hydrous, it's not anhydrous,  
19 unless it goes through the Caribbean and we get the water  
20 out, it's not usable in the U.S. So that's going to be a  
21 constraint. The EPA is not going to be able to say,  
22 "Okay, let's assume we import 500 million gallons a year  
23 of Brazilian Sugarcane Ethanol," unless there's at least  
24 500 million gallons per year of dehydration capacity in  
25 the Caribbean Basin. There is some anhydrous production



1 in Brazil, but not a huge amount -- from the information  
2 I know, you may want to dig into that.

3 And just one final comment. Economics do work,  
4 you know, are the hybrids or the plug-in electric vehicle  
5 sales coming down because gasoline mileage came up and  
6 the economic swing? Are electrical costs going to go up  
7 with the Renewable Portfolio Standard? Are natural gas  
8 costs going to go up? What are gasoline costs? You  
9 know, unless you have an economic basis for a projection,  
10 I don't think the projection will come true. That's all.  
11 Thank you.

12 MR. SCHREMP: And John, this is Gordon, just a  
13 couple of quick notes. So in this table here, you're  
14 essentially talking about the cellulosic diesel and  
15 gasoline may be a bit of an overreach, say, 2012, 2013,  
16 the 45 million gallons you mentioned for 2013, or on the  
17 other side, the right-hand side for even 2012, because  
18 there's really not -- I mean, that's January of next  
19 year, so that's a good point. In fact, I think in our  
20 analysis, we've actually used zero BTL fuels for 2012 as  
21 being available in the United States, we have assumed the  
22 cellulosic ethanol is going to be available at I think  
23 around six million gallons, thereabouts, for all of 2012.  
24 However, starting 2013, I believe we revert to these  
25 numbers which does provide us a little bit more than a

1 year, but your point is well taken, if something isn't  
2 under construction, 2013 is still showing 45 million  
3 gallons of BTL diesel and BTL gasoline, which is 90  
4 million gallons. And it's really not under construction,  
5 then, you know, is 2013 going to be? And I think the  
6 comment on the other advanced, yes, not only did we use  
7 the cellulosic volumes in EIA's projections, which are  
8 lower than Congress' vision, we used the lower other  
9 advanced targets, as well, for United States  
10 availability. Now, albeit they're slightly lower for the  
11 low demand case, but they are, I think, significantly  
12 lower for the high demand case on the right-hand side,  
13 you know, it's a billion gallons less by 2030. So, I  
14 think your point is well taken about the availability of  
15 that material. Are you suggesting using something even  
16 lower than what is in this table?

17 MR. BRAUETIGAM: Yes. I think especially the  
18 closer in you get, 2012, 2013, the EIA is way too high.  
19 I don't know if we're going to see any significant  
20 cellulosic gasoline or diesel. I mean, we're just not  
21 aware of anything that's even near commercial scale. The  
22 first commercial scale project that we know is the  
23 announced project in Iowa for cellulosic ethanol. We're  
24 not -- and other than our renewable diesel plant, but  
25 that's not a cellulosic diesel, that's just a renewable

1 diesel. So I think the EIA numbers are too high on the  
2 other cellulosic and, like I said, I think going out, the  
3 EPA, when they issue a cellulosic waiver, will have to  
4 also reduce the advance by a like amount, the total, but  
5 once again, unless you've solved the economics of how  
6 you're going to get either E15 or E85 infrastructure  
7 built out by people that only have one or two stations  
8 and only earn \$30,000 to \$40,000 a year at the station, I  
9 don't even think the EIA numbers are necessarily  
10 achievable. Economics will rule at the end of the day,  
11 or so far they have when we keep our heads on straight.

12 VICE CHAIR BOYD: A question. You raised the  
13 hydrous, the anhydrous sugarcane ethanol from Brazil, and  
14 I'm wondering the ramifications of your comment to  
15 California as it relates to the Low Carbon Fuel Standard.  
16 And in this room when we had our last hearing, it became  
17 evident that there's going to be dependence on a  
18 significant quantity of Brazilian Ethanol to comply with  
19 the Low Carbon Fuel Standard in the early years. Is  
20 there capacity, adequate capacity, to meet just  
21 California's needs for this specialized ethanol,  
22 dehydrated as one might say, and what might be the  
23 economic ramifications of that California need?

24 MR. BRAUETIGAM: To be honest with you, I don't  
25 know the dehydration capacity in the Caribbean nations.

1 It obviously is as much as the past historical high point  
2 of ethanol imports to the U.S. from there. And I don't  
3 know the capacity of the Brazilian production, in Brazil,  
4 that is, anhydrous. But they are just two points I  
5 thought of recently, I was talking to our ethanol buyer  
6 and he said, you know, you can't just bring all the  
7 Brazilian ethanol in, it's not anhydrous, it won't work.  
8 And I know the Caribbean capacity is known, Gordon should  
9 be able to find that, and there should be something under  
10 Brazilian -- I don't have an answer based on the next  
11 several years, if you could get 10 percent, or 20, or 30  
12 percent of the ethanol California needs from Brazil. I  
13 think obviously you could get 10 percent, but like I  
14 said, I really don't know the number, it's not like we're  
15 in -- don't panic, but don't count on that being the Holy  
16 Grail.

17 MR. SCHREMP: I think -- this is Gordon,  
18 Commissioner Boyd -- I believe the capacity in the  
19 Caribbean Basin Initiative countries for dehydration of  
20 hydrous ethanol is around 600 million gallons,  
21 thereabouts. There was a recent closure of a facility in  
22 Jamaica. There have been some very difficult operating  
23 conditions for the dehydrators in the Caribbean Basin  
24 Initiative, meaning the price of hydrous ethanol, which  
25 is cheaper than anhydrous, was still more expensive than

1 -- that differential wasn't great enough to overcome  
2 their dehydration fee and the incremental transportation  
3 and handling costs of taking the hydrous from Brazil,  
4 stopping in El Salvador, and moving on to the United  
5 States. So there may be capacity there, but as Mr.  
6 Brauetigam points out, there certainly always has to be  
7 an economic justification for that movement to occur. In  
8 fact, we've even read that there's been the construction  
9 of a facility to import ethanol into Jamaica from the  
10 United States because it's a less expensive route than  
11 actually taking hydrous and dehydrating it locally. So  
12 that's an interesting comment in the state of the State.  
13 We recognize that will change, there will be increased  
14 demand for this category of ethanol from both the United  
15 States, RFS2 Proportional Share compliance by various  
16 companies, as well as a desire to use that kind of lower  
17 carbon intensity material in California, and we expect  
18 there to be a premium recognized in those markets,  
19 however, you know, we can't see that yet in the LCFS and  
20 what we've seen is there is a premium for other advanced  
21 under the RIN credits, so we think that will change, but  
22 Mr. Brauetigam is right, it's right now.

23 Now, to your comment on capacity for supply of  
24 Brazil, we look at that as we don't believe that there is  
25 incremental excess supply of Brazilian ethanol that is

1 going to become available in the near or mid-term, even  
2 over their 15-year projections. By the end, it's not  
3 enough as what we're looking at for the Brazilian  
4 ethanol. So our staff's conclusion is that it's more  
5 likely you'll see Brazilian ethanol coming to the United  
6 States and Brazil backfilling to some extent U.S.  
7 ethanol, so we call that the Houston Sao Paulo shuffle,  
8 but a lot of that ethanol from Brazil is actually going  
9 into Florida, and then it's coming out of the Gulf Coast  
10 going to Brazil. So can you exchange? Yes, you can. So  
11 that's a way of looking at Brazil as potential source on  
12 an exchange basis with a premium involved, but depending  
13 on Brazil to come up and say, "Oh, yeah, we have a whole  
14 bunch of excess supply," we don't see that happening over  
15 the near term. In fact, their harvest, their crush  
16 numbers, and their production capacity for this season  
17 are all down from last year and their demand is up, so  
18 that's a difficult dynamic that won't result in more  
19 exports than last year, in fact, it will probably be  
20 less.

21 VICE CHAIR BOYD: Well, the premium you mention  
22 becomes worrisome to me and you start some bidding for  
23 those who have to have it vs. those who just want  
24 ethanol. Thank you.

25 MR. LYONS: Jim Lyons with Sierra Research. Just  
California Reporting, LLC  
52 Longwood Drive, San Rafael, California 94901 (415) 457-4417

1 a quick question, Gordon, on Slide 19. Are those numbers  
2 for the low or high E85 demand case?

3 MR. SCHREMP: I'm not sure, I think that's our  
4 base case outlook for flex fuel vehicles -- the dotted  
5 red line?

6 MR. LYONS: Right, I meant that.

7 MR. SCHREMP: Malachi, is that --

8 MR. LYONS: The green and I guess orange or brown  
9 ones further out in time, do those correspond to one of  
10 the demand cases?

11 MR. WENG-GUTIERREZ: Well, this would be a  
12 representation of one of the demand cases in its  
13 entirety, so each of the demand cases may have its own  
14 set of flex fuel vehicle --

15 MR. LYONS: Okay, is this the high or the low  
16 one?

17 MR. WENG-GUTIERREZ: That one, I'm not sure.

18 MR. LYONS: Okay, if you could let me know, I'd  
19 appreciate it. Thank you.

20 MR. WENG-GUTIERREZ: Sure.

21 MR. HEIRIGS: Hi, Phil Heirigs from Chevron. On  
22 that same chart, was the E85 assumed to be 85 percent  
23 denatured ethanol, or did you do something less than that  
24 like EIA does when they do their assessment of the E85?  
25 I think they use E74 typically when they assess E85 to

1 account for cold start issues and things like that.

2 MR. WENG-GUTIERREZ: So this was done using, I  
3 think it's 79.4 is the percentage we use.

4 MR. HEIRIGS: Is that based on survey data for  
5 California stations?

6 MR. WENG-GUTIERREZ: No, well, it's based on the  
7 ASTM methodology for specification for E85 and it has a  
8 regional variation in the concentration that you can use,  
9 and so we used a seasonally adjusted value for California  
10 as a whole, based on the regions. Yeah, so that's the  
11 number we came up with.

12 MR. HEIRIGS: Great, thanks.

13 MR. WENG-GUTIERREZ: Yeah.

14 VICE CHAIR BOYD: Jay.

15 MR. MCKEEMAN: Something that you should be aware  
16 of is that there's a tax implication in terms of the  
17 amount of ethanol that goes into E85. Board of  
18 Equalization basically says you have to be at the higher  
19 end of the mix, so -- and if you're not, then you lose  
20 your tax credits, and it's just something to be aware of.

21 MR. WENG-GUTIERREZ: Yeah, we're aware of that  
22 and we were waiting for some specifications from ARB,  
23 their regulations about what they want the new  
24 specifications to be. Their old specification, I think,  
25 was 79 percent. Obviously, it has tax implications and



1 we're aware of that, so it's -- we just at some point  
2 will -- hopefully everybody will become consistent and  
3 we'll have a clear picture about what the percentage will  
4 be, and then we can use that.

5 MR. MCKEEMAN: Thank you.

6 MR. SCHREMP: Jay, this is Gordon, that was  
7 actually a good question and, if memory serves, I believe  
8 the Division of Measurement and Standards has looked at  
9 E85 and it's my understanding that they're looking at a  
10 broader range of ethanol content that's going to be  
11 permitted, but --

12 MR. MCKEEMAN: MAS will, that's correct.

13 MR. SCHREMP: Yes. But you're absolutely right,  
14 as a purveyor of E85 and wanting to make sure you're  
15 taxed at nine cents rather than 18, at least that's the  
16 old tax differential, being at the at least threshold is  
17 an issue and a concern. So, as Malachi stated, we want  
18 to continue working with these other agencies that are  
19 involved and hopefully work out an issue where that tax  
20 advantage can still be retained and hopefully some  
21 flexibility in the E85 being sold under the E85 moniker  
22 can be attained, as well.

23 MR. MCKEEMAN: Good luck.

24 VICE CHAIR BOYD: Gordon and/or Malachi, I'm  
25 still reminded of a concern I had in our September

1 discussion with the projections of numbers of vehicles.  
2 I don't have a concern with the here's what you project  
3 it would take in the way of vehicles to absorb this much  
4 ethanol; but what assurances do we have that there will  
5 be this -- that there's any possibility of there being  
6 this number of flex fuel vehicles available in the  
7 California market? I know where we are today, somewhere,  
8 well you have it pretty well pegged, and I may be wrong,  
9 but everything I recall reading is that, you know,  
10 Detroit in particular is less and less interested in flex  
11 fuel vehicles as the café standards begin to wind down,  
12 or at least the credits for this. So are these all pipe  
13 dreams? Is there any chance that there will be vehicles,  
14 that there could even possibly be this number of vehicles  
15 available to absorb this much ethanol?

16 MR. WENG-GUTIERREZ: Sure, yeah, I think it's  
17 possible. I mean, we set a set of conditions under which  
18 we're getting these results. Obviously, it assumes  
19 certain things about technologies, the costs of the FFVs  
20 is relatively reasonable, rather than the others, and I  
21 mean, I think there's going to be a motivation to get  
22 them into the marketplace, as well, to handle the E85  
23 that needs to get sold to comply with these other things.  
24 It's where the --

25 VICE CHAIR BOYD: Why would the manufacturers of

1 vehicles make FFVs if they don't get anything for it as  
2 they have in the past?

3 MR. WENG-GUTIERREZ: Right.

4 VICE CHAIR BOYD: With the expiration of the  
5 credits. I know they're cheap, they're easy, simple.  
6 Short of a mandate that every vehicle, every gasoline  
7 fuel vehicle sold in the United States is an FFV vehicle,  
8 I still wonder how this could be done. But maybe that's  
9 just me.

10 MR. WENG-GUTIERREZ: No, that's a good question,  
11 and I know the OEMs for the vehicles aren't obligated  
12 parties under these. So we'll take a closer look at that  
13 and see if --

14 VICE CHAIR BOYD: I appreciate you looking and  
15 I'm not sure you'll ever find the answer. But I  
16 appreciate you looking.

17 MR. SCHREMP: Well, Commissioner Boyd, I mean, as  
18 I kind of turn the question around just a little bit is,  
19 I mean, one thing we can do, we know there's an existing  
20 population of FFVs in California. We can take a look at  
21 how much E85 those vehicles could use, based on their  
22 assumed vehicle miles traveled, fuel economy, and  
23 selection of E85 during each fueling event and say, well,  
24 okay, at least those vehicles allow us up to X amount of  
25 fuel even if starting next model year that FFVs are no

1 longer offered for sale, or at least when their credit  
2 expires or is scaled down somewhat. So, I think there's  
3 a way to look at we do have a pretty large stock --

4 VICE CHAIR BOYD: Yeah, you could say, "Here's  
5 our likely capability to absorb E85 if everybody bought  
6 it 100 percent of the time because it was economically  
7 attractive," and then you'd be able to demonstrate the  
8 huge delta that there is between our [quote] "obligation"  
9 and that might be a good thing to do, it's fairly simply.

10 MR. SCHREMP: Yeah, I think as this slide is  
11 showing, you know, it's don't need any more than our  
12 business-as-usual forecast until much -- you know, a  
13 decade from now, so therefore the vehicles are adequate  
14 to meet the E85 demand projections. So it's a matter of  
15 how adequate they are above and beyond. So I think it's  
16 a good question to take a look at because, from your  
17 comments and what we noted earlier, there is a risk  
18 because of these other competing factors for business  
19 considerations by engine manufacturers and vehicle  
20 purveyors. So we understand those competitions and how  
21 it could change the mix from this business as usual, so  
22 it's a point well taken.

23 MR. WENG-GUTIERREZ: And then just another  
24 comment. I mean, our hope, of course, is that they are  
25 available to help comply with some of these policies if

1 they don't exist, and maybe E15 -- maybe the blend wall  
2 or something like that would alleviate some of that need,  
3 but we have taken the position, I think, that E85 is kind  
4 of a relatively reasonable mechanism. But, again, it  
5 presumes that there are vehicles, so....

6 VICE CHAIR BOYD: Well, regarding whether  
7 California ever ascends the blend wall is a question you  
8 can refer to our friends at the ARB. Malachi might be  
9 close to retirement before that anyway. Were there any  
10 phone questions?

11 MR. PAGE: I guess at this point we need to kind  
12 of check whether people need to take a break, or should  
13 we plow ahead? Any preferences? Well, hearing none, I  
14 guess we just continue.

15 VICE CHAIR BOYD: Plow on.

16 MR. SCHREMP: No break? It's a Friday afternoon.  
17 All right, now this is actually the least controversial  
18 and I probably shouldn't have any questions on this one,  
19 going through it. We once again apologize for not having  
20 in advance a lot of detail that stakeholders can review  
21 on what actual volumes of various fuels we're using, as  
22 well as the amount of credits associated with the types  
23 of fuels and the amount of carbon deficits, so we will  
24 have that quite soon. I think by the end of tomorrow,  
25 we're going to be providing that information out to

1 stakeholders, so you can see those details and start  
2 comparing and contrasting those results with what the Air  
3 Resources Board has already released for their  
4 illustrative compliance areas.

5           So the purpose is just that, looking at what mix  
6 of fuels you can use to achieve compliance under the Low  
7 Carbon Fuel Standard, and we talked about that back in  
8 September and basically we had used any fuels, we had set  
9 some assumptions about what would be available for  
10 different types of fuels, but there were no costs  
11 whatsoever involved in that information, in that level of  
12 assessment. So what we've done now is gone back, looked  
13 at an array of costs for biofuels, and then in the  
14 modeling process, it being selective in terms of least  
15 cost per carbon intensity for the materials. So it  
16 changes the mix, it reduces the amount of carbon credits  
17 accrued in the early years, and you'll see that in just a  
18 little bit.

19           So a couple of other issues important to note,  
20 and that is to ensure that there is no biodiesel NO<sub>x</sub>  
21 mitigation issue, we understand that biodiesel blends at  
22 the five percent, there is not a NO<sub>x</sub> issue at this time,  
23 but at blends six to 20 percent, you have a NO<sub>x</sub> issue that  
24 must be mitigated by using a certain ratio of renewable  
25 diesel. So, to the extent that we use renewable diesel

1 in a particular case, we use essentially about one-fifth  
2 of that, more biodiesel in the mix. So if we were to  
3 calculate what the percent of biodiesel is in the fuel  
4 for diesel, it would be greater than five percent in some  
5 of these cases, so that's why it's the portion above five  
6 percent that is mitigated with renewable diesel, or based  
7 on renewable diesel on that.

8           So the issue at hand, and this is the case not  
9 just for our assessments and assumptions, but those of  
10 the Air Resources Board that Mike Waugh is going to talk  
11 about, and that is plausibility. So, you know, what is  
12 the likelihood that X fuel is going to be available in Y  
13 quantities, and those are very good questions. And like  
14 everything else, this is in perspective for looking  
15 ahead, we're using recent historical viewpoints and we  
16 understand that technologies and what is available can  
17 change as time goes by.

18           So we do have a common set of assumptions in this  
19 new set of analysis, and as I've already mentioned, least  
20 cost, lowest carbon intensity material selected first.  
21 And there is some credits that were minimized and we  
22 wanted to make sure we weren't showing 4 million tons of  
23 credits in the first year when the Air Resources Board is  
24 showing 300,000 tons in six months. So we wanted to be  
25 more as aligned with what's going on in 2011 as we could

1 be, and then targeting not too much over-generation and  
2 excess credits in the early years of the program.

3           So we understand we put some of the participants  
4 into non-obligated and obligated, and what we mean by  
5 that is someone may have really no carbon deficit, and  
6 yet they can generate credits, this could be biogas, this  
7 could be electricity, things like that, and therefore  
8 they don't have any deficits to offset. So what would  
9 they do with those credits? So we believe that they'll  
10 sit on the credits in anticipation of higher value as  
11 time goes by; however, by 2020, the market will rise to a  
12 point where that's probably the highest, and then what  
13 the market will do will be to fluctuate, depending on  
14 supply and demand at that time, but we believe there will  
15 be an escalation of the value over time in the LCFS  
16 credit market. So check back with me in 2020 and see if  
17 I was right.

18           So no adjustments to exclude the credits for high  
19 carbon intensity crude oil use. We understand that, if a  
20 refiner does use a potential high carbon intensity crude  
21 oil, and they have also generated excess credits, that  
22 they would have to sort of clear the incremental carbon  
23 debt associated with the high carbon intensity crude oil  
24 before utilizing those credits, or those credits will be  
25 frozen or allowed to expire. So we don't know how much



1 of the credits so far in the program may be from  
2 obligated parties who fall under that category of using  
3 some high carbon intensity crude oil. But looking at the  
4 data through, I think, August, we do see high carbon  
5 intensity crude oils, some portions still being imported  
6 into California, albeit after June, at a lower percentage  
7 of that market in the first couple months of July and  
8 August. So it seems to be a change in some of that  
9 behavior already occurring.

10           So looking at Case 3, in particular, I won't show  
11 Case 1, I won't show Case 2, but we will provide that  
12 data, like I said, some time tomorrow to folks. But I  
13 just wanted to sensitize you that Case 1 isn't really  
14 complying with the Federal Standard; the ground rule in  
15 Case 1 is no cellulosic fuels allowed whatsoever, and  
16 that's not compliance, as far as we understand it, with  
17 the Federal RFS2, and then would show if you can't use  
18 any cellulosic fuels, then your ability to comply with  
19 the LCFS is reduced, the number of years you can comply  
20 is reduced, and the answer is, "Well, duh, of course."  
21 That just goes to show you the importance of cellulosic  
22 fuels, both ethanol, and drop in gasoline, and drop in  
23 diesel. They are very valuable under the LCFS program to  
24 help achieve compliance. So we're not going to show  
25 those cases; we did in September just for illustrative

1 purposes to show that, really, you need those other fuels  
2 to comply. And I think Mike Waugh will are that those  
3 are important fuel that we'll be dependent on. So that's  
4 why we're not showing the other cases.

5           So here there is full compliance with the Federal  
6 Standard, however, the ground rules, if you will, for  
7 LCFS analysis are, okay, well, you use your proportional  
8 share of cellulosic fuels as EIA has said that are  
9 available, we're allowing up to 50 percent of what's  
10 available from EIA's projection in the United States to  
11 come to California. Now, so you might say, "Well, that  
12 seems like a lot, especially if NESCOM in the northeast  
13 states for their LCFS analysis says, "Yeah, well, I  
14 thought we were going to use all of that." So those are  
15 good questions about availability. So that's one ground  
16 rule we put in place to allow more carbon credits and  
17 diminishment of some of the carbon deficit to help  
18 achieve compliance. Another is allowing some of the  
19 lowest CI material, pursuing ethanol at a very large  
20 quantity that hasn't come into the United States before,  
21 and Commissioner Boyd's comments are well taken, you  
22 know, where is that going to come from? And Mr.  
23 Brauetigam's, yeah, it would have to be on sort of a swap  
24 basis.

25           Renewable Diesel, we're allowing the quantity by

1 2017 to go up to 50 percent of what we think could be  
2 available from that type of feedstock, inedible Tallow,  
3 so almost 220 million gallons. And then biodiesel from  
4 corn oil, not a lot of that produced today, very low  
5 carbon intensity, under six grams, and then we're saying  
6 that 50 percent of that corn oil supply, which of course  
7 does have other uses, does get converted to a biodiesel.  
8 And it's for low carbon intensity up to that much, if  
9 necessary.

10           And the same with used cooking oil, a 200 percent  
11 of registered facilities, a quantity of almost 160  
12 million gallons. So those are sort of our caps on supply  
13 availability when we go to tap in to use that, but  
14 recognize that those last two categories of biodiesels,  
15 there is a limit, if you will, in California of how much  
16 biodiesel we're using because of the NO<sub>x</sub> mitigation issue.  
17 So if one were to say, "Well, you could do B10 or B20,"  
18 well, yeah, you could get an awful lot of credits that  
19 way, but there are other considerations.

20           So here are some sort of supply availability  
21 ground rules, and then people can please give us comments  
22 on, "Well, that seems to be an overreach," or "That seems  
23 inappropriate," or "How come you didn't go higher?" You  
24 know, let us know.

25           So you take all of that in consideration and you

1 say, "Well, what's the mix of fuels?" So, as I  
2 mentioned, Midwest Corn Ethanol still is showing up and  
3 continuing on into 2017, and then it comes back again,  
4 has a comeback later on. But you're starting to see some  
5 of the Brazilian Ethanol that was mentioned a little bit  
6 now, but actually started going in a big way in 2016.  
7 And the important fuels, meaning in terms of their carbon  
8 intensity, whether that's, say, cellulosic ethanol, BTL  
9 Diesel, and I think the BTL gasoline in the yellow,  
10 that's after 2017. That's when we've said you can go  
11 ahead and go 50 percent of what EIA says is available.

12           So now you start to see sizeable use of that  
13 material and this is very important Low Carbon stuff. So  
14 what happens is this allows essentially compliance  
15 through 2017 and there are some excess credits getting to  
16 another year, getting to 2018 here. And then back into  
17 compliance. Now, you can't see that yet, but if you wait  
18 a couple slides, and those of you who peaked ahead, you  
19 can already see that, I'll show you where that bar is.  
20 But I just want to show you the different types of fuels  
21 that we're looking at for our compliance analysis, and so  
22 here again Midwest Ethanol, an awful lot of it, and that  
23 phases down, replaced primarily by Brazilian, and you see  
24 some California Ethanol here that is already lower than  
25 traditional corn ethanol, and is expected to get even

1 lower when they comply with our CEPIP provisions to  
2 reduce the carbon intensity of their direct emissions at  
3 their facilities. So lots of use of ethanol still, but  
4 then cellulosic starts to come in, in larger quantities,  
5 and then the BTL gasoline. So these are gasoline  
6 substitute, gasoline blend fuels.

7           So looking at the diesel side of the equation,  
8 you see ground rules again, 2017, opens up the supply  
9 availability spigots, and the model will want to take  
10 that material and take it up to a large amount. So what  
11 can happen here is, because you're using some renewable  
12 diesel, which is that material which I said mitigates a  
13 NO<sub>x</sub> increase of about five percent biodiesel blends, then  
14 whatever you're using here, essentially one-fifth of that  
15 can be that much more -- or one-fourth of that can be  
16 additional biodiesel. So it helps bring that material  
17 back up by the amount of renewable diesel, as well as the  
18 amount of BTL diesel. So that sort of allows the  
19 biodiesels to come up even greater, and the continued use  
20 of even soy and canola biodiesel because it still gives  
21 you credits and is the least costly biodiesel out there  
22 compared to these other ones, when I start talking about  
23 that.

24           So put them altogether and say, okay, well what  
25 are the various credits that you're getting for those

1 types of fuels? And so here is the array -- and once  
2 again, we'll provide you the spreadsheet that has this  
3 data, so this is just -- look at this and this line is  
4 the deficit line, the carbon deficit in metric tons, for  
5 the gasoline, petroleum-based gasoline, petroleum-based  
6 diesel, in the forecast and this is the low demand and  
7 high petroleum price forecast. And, oh, by the way, we  
8 think that this is the more relevant forecast to look at.  
9 The other low prices, high demand, isn't exactly the  
10 regime we've been in over the last couple years and it  
11 doesn't seem to be the low price regime we're going to be  
12 in over the next couple of years. So this is probably  
13 the more germane set of cases to look at is the high  
14 petroleum price, low petroleum demand scenario.

15           So here, even going up to 50 percent of the U.S.  
16 supply as EIA has stated of cellulosic fuels, those three  
17 types, ethanol, gasoline, and diesel, still you fall  
18 short of achieving compliance up through 2020 and all the  
19 way, you get back to 2025, that's where you can get back  
20 into compliance. Now, can you build up, incur additional  
21 costs and build up additional credits greater than we're  
22 showing and help you get more compliance? Yes. But that  
23 starts to become a rather challenging task when you look  
24 at the quantity of credits that you're short four million  
25 tons and here a very large shortfall of credits, it's

1 hard to build up that much excess credits and roll them  
2 through to help get you through this period of time.

3 Another way is you can go ahead and increase the  
4 amount of biomass to liquid gasoline diesel using above  
5 and beyond 50 percent of the U.S. supply -- 70 percent,  
6 80 percent. And I don't know if we looked at using all,  
7 if that would actually get you all the way there or not,  
8 but that's, I think, a sensitivity we can consider  
9 looking at later.

10 So this is just illustrating the point that a  
11 very broad array of fuels, a lot of which we don't  
12 currently use in California, and most of which will come  
13 at a higher price tag, still don't get you full  
14 compliance through 2024, or even through 2020 here.

15 Now this, like I said, we think is the less  
16 plausible scenario being low petroleum prices and high  
17 demand, and this results in a longer period of non-  
18 compliance under this set of circumstances for Case 3,  
19 and part of the reason it's longer, non-compliance, is  
20 because you have a higher quantity of gasoline and  
21 diesel, which has higher associated carbon deficit that  
22 must be offset. So that's why you'll see a bigger hole,  
23 if you will, in the compliance for this set of  
24 assumptions, for this case.

25 So I think I've covered this compliance through

1 2017, so the takeaway is that we can show compliance and  
2 we really haven't increased beyond proportional share at  
3 that point yet of cellulosic fuels, so assuming Mr.  
4 Brauetigam's comment again, very appropriate, near term  
5 availability, maybe not so much, but 2014, 2015, so  
6 you're showing you can get compliance through the first  
7 half of the program, 2015 to 2017, even 2018, but it's  
8 going to come at a cost and some would argue after 2017,  
9 even that large increase in cellulosic use here, it might  
10 be a bit of a stretch. But we'll let people weigh in on  
11 that.

12           So I think I've covered all of these other  
13 points, so I'll just move on to the next slide. So,  
14 additional concerns? This is Commissioner Boyd's concern  
15 about the availability of Brazilian Ethanol, yes;  
16 Biodiesel, we're showing fairly early use of biodiesel,  
17 and so that's going to necessitate an infrastructure in  
18 California, meaning to be able to dispense B5 into a tank  
19 truck before it goes to a truck stop, you need to have a  
20 B100 tank at the distribution terminal. So, we already  
21 know that the minority of the distribution terminals in  
22 California have a B100 tank and the majority do not. So  
23 that's an infrastructure issue, but it can be dealt with  
24 in a reasonable period of time. So that's not really a  
25 barrier that can't be overcome, that's pretty easy to



1 overcome with some time and money.

2           The renewable diesel, that is a significant  
3 increase and, so, feel free to weigh in on that. And  
4 certainly this 50 percent increase of U.S. availability  
5 is an issue and, especially if one considers other areas  
6 going to LCFS, which is one of my last slides, they're  
7 almost looking through similar lenses, they're looking at  
8 these kinds of advance fuels, they're looking at saying,  
9 "Well, okay, what does the EIA say? I'll take 50  
10 percent, 60, 70 percent of that," both looking at the  
11 same pot of important liquids is going to be a problem --  
12 does anyone want to call them right now? I've been  
13 disconnected from -- did I ramble on too much? Is that  
14 your button you use up there, Commissioner Boyd?

15           VICE CHAIR BOYD: It appears we forgot to pay a  
16 bill somewhere.

17           WEBEX: "Welcome to WebEx. Please wait a moment  
18 while we connect you to your meeting. You will now be  
19 placed into the conference."

20           MR. SCHREMP: I apologize to people online who  
21 may have been disconnected temporarily. Don't feel bad,  
22 we didn't have access to email all day Sunday, so there  
23 you go.

24           Now we'll transition to the other part that we  
25 didn't talk about at all really on September 9th, and

1 that is the cost of biofuels. So we believe that those  
2 values will increase because of, I mean, RFS2 wanting  
3 those fuels, LCFS, so we said, well, okay, now how do we  
4 go about getting a starting point for those biofuels? So  
5 we looked at using historical information near term that  
6 was available for a lot of these fuels, and if you don't  
7 have the actual fuel type you're looking for, you can use  
8 some sort of surrogate to construct values for other  
9 things like cellulosic ethanol advanced biofuels.

10 So here is sort of the starting point and I'll  
11 talk a little bit, just a slide each, on the various  
12 categories of fuels. So, the Ethanol, we did look at  
13 Brazilian Sugarcane, there's lots of good pricing  
14 information, you can do calculations on transportation  
15 costs to get here, so these values, or what we came up  
16 with for all of 2010, a \$1.04 more than Midwest ethanol,  
17 and that's delivered to California, and \$1.56, a bit  
18 higher in the first eight months of 2011. Now, Caribbean  
19 Basin Initiative Ethanol is less expensive, but it's not  
20 less expensive by the tariff you pay, it depends, but  
21 there's a processing fee, like I said, there's an initial  
22 transportation cost handling fee, so it's not quite that,  
23 but it is less expensive. So this actually works out to  
24 be probably the best buy for the lowest CI material  
25 available on a commercial quantity, but still more

1 expensive than the Midwest Ethanol. So we've elected to  
2 use for low prices the 2010 information and, for the  
3 high, the 2011. And you'll see that in the information,  
4 well, I think we've published on a two-sided sheet out on  
5 the table in micro font -- Jim Page likes that -- so it's  
6 all in one place, these prices. So use your magnifying  
7 glass and you see them. But we'll put that in the  
8 spreadsheet, as well, that we'll send out to everybody.

9           So biodiesel, we know there are values for  
10 biodiesel, but we think it's good to look at the RIN,  
11 what the market is telling you because there is  
12 fluctuation in that marketplace, and so essentially you  
13 use a multiplier of 1.5 and then you apply that to  
14 diesel, whatever the diesel is. So using that approach,  
15 you've got a \$.42 differential and about triple that in  
16 the first eight months of 2011. And so the estimated  
17 averages, and you get quite a spread between the two, so  
18 same approach to 2010 values, that sort of goes in the  
19 low price basket, and 2011 in the high price basket.

20           Cellulosic Ethanol, really none being sold the  
21 last three years, so RIN values can be instructive,  
22 lacking anything else, and we're applying that to  
23 Brazilian Ethanol as something that would be even more  
24 expensive than Brazilian Ethanol. Brazilian Ethanol can  
25 be as low as, I think, 56 grams, thereabout, if it has

1 co-gen at the facility and if they use mechanized  
2 harvesting. So certainly, cellulosic can get much lower  
3 than that, so it should come in at premium to that best  
4 commercial ethanol, in our opinion, and that's why we  
5 elected to use that as sort of a benchmark, to add a RIN  
6 premium, too, be that right, or be that wrong, and then  
7 the low and high price is the same thing, same dynamic.

8 BTL Fuels, really you're getting into an arena  
9 that usually has less the information, but that's a  
10 really good value, but an expensive technology, Mr.  
11 Brauetigam was talking about, and they are in the  
12 advanced fuel business, yet what capital is being  
13 deployed for is not really BTL gasoline, BTL diesel, at  
14 this time, it's an even more expensive technology. So  
15 we're using these premiums, \$2.00 a gallon and \$3.00 a  
16 gallon vs. the relative metric, whether it's base  
17 gasoline or base diesel. So this is likely the most  
18 expensive fuel in here and the lowest carbon intensity  
19 material.

20 So we'll go ahead and just show you these  
21 graphically and you can see the relative difference in  
22 the values on the slide, and that's all it's meant to  
23 show, and that there is some significant spread for most  
24 fuels between the low and the high price, which comes  
25 into play when you apply carbon intensities. Why? What

1 does this say? No carbon intensity adjustment. So we  
2 develop these starting historical prices that we'll put  
3 in the low and the high side, and then what we do is we  
4 increase them over time in two ways, the first way is to  
5 increase the starting prices at the same rate our  
6 petroleum prices are growing under the low demand and the  
7 high demand. So they gradually go up and, in fact, in  
8 some cases they come down a little bit at the tail end of  
9 the forecast period. So that's one adjustment. Then we  
10 adjust these prices upward based on their carbon  
11 intensity, and then their carbon intensity has value  
12 depending on how far away from the target it is, as well  
13 as what your assumed cost of carbon is, which I think ARB  
14 has shown in their illustrative compliance scenarios, a  
15 range of carbon cost and values. And so what you start  
16 with has an impact on what the premium is going to be,  
17 what you assume the carbon value is.

18           So we've done just that, we've started off with a  
19 \$25.00 a ton for both low and high price, and then you  
20 work your way up to \$100 a ton on the low price scenario,  
21 or \$200 a ton for the high price side, and that's for the  
22 Ethanol. And why I say it that way is because that has  
23 certain energy intensity, if you will, and so there's in  
24 fact a multiplier for these other fuels relative to  
25 Ethanol to get to a higher carbon cost, if you will. So

1 that's how we calculate the premiums on the fuels.

2           So this slide is using some selected diesel  
3 substitutes and you'll notice a couple of things, some  
4 selected periods, 2012, 2015, and 2020. So pick a fuel  
5 and you'll see that it goes up over time because the  
6 carbon cost is going from that low \$25.00 a ton upwards  
7 of \$100 or \$200, and then you can look at different fuels  
8 relative to each other in that particular period, and  
9 they will go down based on their carbon intensity. So  
10 the highest should be corn, and then it goes down here.  
11 Now, why is this one sort of spiking up above the others?  
12 Because it's diesel and it has a different multiplier, a  
13 higher multiplier, so that's why it sort of spikes up.

14           So I'll go on to gasoline. Similar behavior,  
15 starting point in 2012, it then goes up, and you see  
16 actually Brazilian Hydrous Ethanol through CBI country of  
17 El Salvador, there's actually a slight negative, and then  
18 it goes up from there. So premiums will increase the  
19 values even more and the prices you have on that sheet  
20 that are on the table there for folks here at the  
21 workshop, and I apologize to those in line that don't  
22 have the sheet, those are the full price if you will,  
23 both for low demand and high demand, meaning they have  
24 these carbon intensity premiums already laid into them.  
25 And why would you do that? Well, you look at those

1 biofuel values for two reasons, one is in the modeling  
2 set-up, it's to preferentially select the least cost  
3 material, but still with an eye on trying to achieve  
4 compliance with LCFS for a particular period. So if it  
5 doesn't have to use Brazilian, it will use a less  
6 expensive, but a lower CI material which has a lower  
7 cost. So that's why you have the prices in there.

8           Another reason for these values is to do a  
9 comparison, it's like, well, what is the Low Carbon Fuel  
10 Standard going to cost? What could it cost based on the  
11 assumptions you lay out? Well, you just can't add up all  
12 those fuels and those anticipated costs based on your  
13 assumptions and say, "Well, there's the cost," no. Why?  
14 Because there is a Federal regulation that will require  
15 advanced biofuels, will require cellulosic fuels, and to  
16 some extent some biodiesel, and those will have costs to  
17 consumers and businesses. And so that's the comparison.  
18 And so you look at what is the proportional share for  
19 California for RFS2 compliance, and that will have a  
20 cost. Now you look at your LCFS cost and say, "Okay,  
21 what is the difference between the two?" So that's sort  
22 of a simplistic starting point, if you will. There are  
23 other issues like, for example, well, on the LCFS you're  
24 counting electricity and natural gas credits as part of  
25 compliance, and those have a cost, and so we've included

1 those costs in here, but then there are other costs, like  
2 what about the infrastructure? And these were costs that  
3 were brought up earlier. Well, that's a societal cost,  
4 but now, okay, so do you need a CNG infrastructure for  
5 RFS2? Do you need an E85 infrastructure for RFS2? How  
6 much? And so that can be quite argumentative about what  
7 you have to have in there. So I think, for this initial  
8 starting point, we haven't attempted to roll any of this  
9 other cost in, but we want to keep interfacing with ARB  
10 technical staff to try to see what is sort of the  
11 appropriate methodology for doing this comparative  
12 between LCFS and RFS2 in terms of incremental costs.

13           So I show this slide almost begrudgingly and I  
14 get a vision when I watch some of the old movies, *Mr.*  
15 *Smith goes to Washington*, when he says something  
16 controversial, and all the reporters rush out of the  
17 chamber to the phone booths. Now, everyone has their  
18 Blackberries and they're on their Smart Phones, so please  
19 don't just rush out and say, "Is that \$9 billion a year?  
20 Is that what the price tag on this baby is?" No. Don't  
21 focus on that, this is just to illustrate the point of  
22 kind of an interesting dynamic, if you will, in the cost  
23 analysis. This is for Case 3, Low Demand, so this has  
24 higher values, that you see a curious phenomena, if you  
25 will, of almost like, "Well, good, the LCFS is going to



1 save people money in the early years and then it's going  
2 to cost a little bit more later on." Well, there's some  
3 interesting things going on here, meaning there's some  
4 proportional share that we're using, we're not maybe  
5 using quite the right minimum percentages of other  
6 advanced, we think we are, but there's something curious  
7 going on here, but we think there should be some small  
8 positive value, but it would be modest, we expect, in the  
9 early years because you're having to use cellulosic fuels  
10 to meet RFS2, and not necessarily -- you don't need to go  
11 beyond there. However, in 2018, in Case 3, one of the  
12 ground rules, the important ones -- and everything is in  
13 the assumptions, you change the assumptions, you change  
14 results -- in 2018, we said, "Okay, if you need to, to  
15 get more credits, use up to 50 percent of the cellulosic  
16 fuels in the United States according to EIA." All right,  
17 went ahead and did that and that is when you start to get  
18 some large cost differentials in how we've set up this  
19 calculation. And then you start to get these very large  
20 -- because you're using an awful lot of BTL gasoline,  
21 diesel, and cellulosic ethanol above and beyond the  
22 proportional share, which again is about 10 percent in  
23 California, and all of a sudden now you zoom upwards of  
24 50 percent. So a five-fold increase can rapidly increase  
25 the cost for the quantity and the associated costs for

1 those kinds of fuel.

2           So I just show this for essentially illustrative  
3 purposes, we want to work with ARB to say, "Okay, what is  
4 the right way to try to assess these? What costs should  
5 one have included? What costs should one have excluded  
6 from this?" Because, for example, ZEV mandate is a  
7 program, and the ZEV mandate has vehicles, they have  
8 incremental costs, it has infrastructure necessary, yet  
9 you can get credits here. So is that like a bright white  
10 line? No, don't look at those costs. So we recognize  
11 from societal perspective, yes, that when doing this  
12 comparative analysis, LCFS and RFS2, you know, maybe  
13 that's not appropriate to include them here. So it's an  
14 open question issue, please give us your feedback on  
15 that.

16           So what else are we going to continue doing? We  
17 are going to continue working on this besides doing what  
18 Gina said, and every year we're going to do an IEPR, or  
19 kind of like that, we'll do a staff IEPR! My Office  
20 Manager is nodding his head; he's giving me the eye. So  
21 we'll do our best to do more work, work harder. We want  
22 to look at some things we haven't done yet, well, first  
23 of all provide the stakeholders what we promised, show us  
24 the numbers, so we are going to do that some time  
25 tomorrow and some spreadsheets we're going to provide you

1 folks.

2           In addition to that, we clearly recognize a  
3 couple of things going on, one is the Air Resources Board  
4 has some modifications, proposed modifications to the  
5 Standard, they are taking to the Board December 15th for  
6 the Board's consideration. Those do have some potential  
7 implications for this kind of analysis, for example, the  
8 revised HCICO provisions, there's changes, and it's  
9 revising sort of the base calculation of what is the  
10 carbon intensity of gasoline and diesel. Well, it  
11 depends on the crude oil and its carbon intensity. And  
12 so that has implications for changing those numbers and  
13 changing the target values that can affect the analysis.  
14 So, no, we haven't looked at that yet for those, but we  
15 want to work with the Air Resources Board staff to say,  
16 "Okay, is this the right way to interpret that? And how  
17 would we do that analysis?"

18           Another area that we're going to continue to  
19 work, there will certainly be some suggestions on, well,  
20 "This is a sensitivity you should look at. And how about  
21 this? And how about changing that assumption?" Please  
22 give us your thoughts, share with us your thoughts on  
23 what you think would be some good sensitivities. And as  
24 I already mentioned, this initial foray into a cost  
25 differential analysis, we're going to continue working

1 with ARB in assessing what we think biofuel values could  
2 be in low and high terms, and how they can change over  
3 time. And so we do want to understand that, but we also  
4 want to understand why there are differences between  
5 their illustrative compliance cases and our cases, in  
6 terms to say the amount of gasoline that's being used and  
7 the associated carbon deficit is different for their  
8 cases and the ones we've done, as one example. But we  
9 want to continue working with the Air Board because it's  
10 our understanding that recent scenarios have changed  
11 somewhat, and so we were hesitant to move forward and  
12 look at and document these differences to try to  
13 understand them now; we'd rather wait and make sure what  
14 they're going to be presenting on Thursday is like, okay,  
15 that's where you're at now, okay, now let's look and see,  
16 are there differences? If so, what are the differences?  
17 And why are there differences? You know, what's behind  
18 it, is it different assumptions, different calculation  
19 methodologies? So we're not there yet, but we'll  
20 continue working with the Air Board to best understand  
21 that.

22           And as I mentioned before, we will at some point  
23 have a final staff report that will contain this work,  
24 albeit likely after the Draft IEPR comes out for  
25 stakeholders' consideration.

1           Final slide. I had this slide on September 9th,  
2 I just wanted to place it up there again just to note  
3 that we've made a lot of assumptions about what fuels  
4 might be available and then to be a little bit California  
5 centered to say, "Oh, but of course they'll come here."  
6 And saying, "Well, that's all well and good, but tallying  
7 up the amount of LCFS-like regulation fuel demand outside  
8 of California, those levels are quite large -- up to four  
9 times the amount of gasoline in California, and up to a  
10 little over seven times the amount of diesel fuel. So,  
11 like I mentioned briefly before, NESCOM in the northeast  
12 states says, "Well, we're going to use a whole bunch of  
13 that BTL gas and diesel and cellulosic fuel, we've got  
14 ours, where are you going to get yours?" And so,  
15 increased competition for a scare supply of fuels, in the  
16 case of cellulosic fuels, fuels that haven't yet to be  
17 produced, is likely going to lead, everything else being  
18 equal, to higher market prices. So it is an issue, it is  
19 a very important issue in terms of will there be enough  
20 fuel of the right kind available for use in California  
21 under the program.

22           So that's my final slide and I'd be happy to take  
23 any questions from the dais?

24           VICE CHAIR BOYD: No questions yet, Gordon.  
25 Questions from the audience?

1 MS. LAW: My name is Karen Law, I'm with Tiax.  
2 Gordon, could you go to one of your earlier slides, the  
3 bar chart was, I think, your low and high demand? I  
4 think you just passed it -- about eight or so. That one.  
5 I know your focus is on biofuels, I was just curious  
6 about your natural numbers. What are those based on and  
7 could you talk a little bit about how the renewable and  
8 natural gas is considered or not considered in these  
9 numbers?

10 MR. SCHREMP: I would be happy to have Malachi  
11 answer that question.

12 MR. WENG-GUTIERREZ: Well, we have included to a  
13 certain extent -- Gordon mentioned how we were looking at  
14 in the near term credits generated by non-obligated  
15 parties. We are assuming for the most part that the  
16 compressed natural gas components and LNG and the  
17 California biogas volumes are basically from non-  
18 obligated parties, so there's a certain amount of them  
19 currently generating credits. We've tried to emulate  
20 that in the early years and we're having them increase  
21 over the period of time for the LCFS Standard. So the  
22 natural gas numbers that we have in there are derived  
23 from our forecast of demand, so they include both light  
24 duty and heavy duty consumption for natural gas. And  
25 we've then overlaid the biogas facilities in California

1 that are used, or that are being funded through AB 118,  
2 and we have projections about their volumes that will be  
3 available, and we've used those, as well as the CI values  
4 that correspond with them. And that is primarily the  
5 basis for what we've included into these estimates for  
6 the natural gas and biogas.

7 MS. LAW: So is it pretty fair to say that it's  
8 considered to be pretty constant throughout and it's not  
9 going to grow?

10 MR. WENG-GUTIERREZ: Sure, it grows a little bit,  
11 but not hugely.

12 MR. SCHREMP: But, Karen, I think for this slide  
13 here, the quantity of natural gas for both light duty and  
14 heavy duty use does grow over the period, but something  
15 else is happening, its relative distance from the target  
16 is getting -- your carbon differential is not as great,  
17 so even you can have a growing quantity, but the  
18 diminishment of the carbon intensity value can take away  
19 how much total credit that this slide is showing the  
20 credit quantity over time. And you'll see that in the  
21 material we'll release tomorrow, it will actually show  
22 the quantity of the natural gas for those various types  
23 of end uses and it will show the calculated credit for  
24 that natural gas over time. So we'll actually show that  
25 to you right now. I apologize we don't have that yet.

1           MR. WENG-GUTIERREZ: And there is two competing  
2 things in the early part, at the rate of credits being  
3 utilized for compliance, one again is participation and  
4 how many credits you're generating early on, and as  
5 Gordon is suggesting, there's the change in the value of  
6 those credits. So those do -- I mean, if we have instant  
7 participation of everyone and they all just use all the  
8 credits, then we could get a lot of credits at the early  
9 part of the scenario, but that's not borne out by the LRT  
10 values that are currently being reported. So there's  
11 that, that minimizes the amount of credits being  
12 generated now, and then the value of the credits over  
13 time decreasing, so it does kind of counter, so as you  
14 get higher participation, the value decreases, so the  
15 credit generation then somehow is kind of constant. In  
16 general, natural gas entering the system creating credits  
17 is increasing; it's just whether or not the value is  
18 increasing depends on when and the rates, and those sorts  
19 of things.

20           MS. LAW: Great. Thank you.

21           MR. MCKEEMAN: Hi, Jay McKeeman, California  
22 Independent Oil Marketers. That's a good slide to stay  
23 on. So if I understand correctly, what's being presented  
24 here is the Energy Commission's best guess at the fuel  
25 mixes, but that's basically based upon the Federal



1 standard, right? Or the Federal Achievement levels?

2 MR. SCHREMP: Jay, this is Gordon. I would say  
3 that it's the fuels you're seeing here are, I think for  
4 three primary reasons, one is there is a proportional  
5 share assumption, so you must use at least X amount of  
6 cellulosic and other advanced fuels. So you're going to  
7 need to see that, and so this is really sort of the  
8 credits, you go over here for those kinds of fuels. So  
9 that's sort of the fuel side, and then we've made  
10 assumptions on the upper bounds, and then you get into,  
11 well, what's the cost and the carbon intensity and that's  
12 based on our biofuel price assumptions that cause which  
13 of the fuels the model wants to select to help achieve  
14 compliance when you start calculating these credits here  
15 relative to that deficit line. So you're right, for  
16 example, if we say, "No, don't use cellulosic fuels," or  
17 you couldn't use any, you wouldn't even see those fuels  
18 and you would see a much larger gap. So it is -- so we  
19 could say it's sort of our best guess, it's sort of --I  
20 think this complies with RFS2 proportional share, at  
21 least, and goes beyond because it needs to, to get  
22 additional credits. So this is probably the most -- I  
23 mean, this case is the one that shows the most compliance  
24 for the three cases we've run, and we'll show you guys.

25 MR. MCKEEMAN: Okay. Thank you for that

1 explanation. The bars that strike me as kind of the  
2 toughest part of the hurdle is 2014 to 2018 when we're  
3 essentially doubling our reliance on low carbon fuel  
4 mixtures in diesel and gasoline. Has Energy Commission  
5 basically done any sensitivity testing as to whether  
6 that's achievable?

7 MR. SCHREMP: Well, I think going to the slide  
8 for gassing and substitution, meaning ethanol, you are  
9 seeing Brazilian Ethanol in 2012, January next year,  
10 some, I would say, modest quantity as this slide shows,  
11 and so we think on a swap basis, if you will, this is  
12 certainly doable. Incremental supply? Maybe  
13 questionable, you know, to be determined. But still  
14 using Midwest and California Ethanol, so this is, we  
15 think, this ethanol quantity. We start looking at  
16 something like Midwest Sorghum, which has a pretty good  
17 carbon intensity, will -- someone will actually produce  
18 it using that feedstock? Well, that might be a bit of an  
19 issue. But these other fuels have yet to be produced in  
20 commercial quantity, as Mr. Brauetigam was pointing out,  
21 are very small slivers at this point through 2015, 2016  
22 and it starts to get a little bit bigger here.  
23 Cellulosic ethanol, for example. So we don't think those  
24 things are, from staff, I would say that's a stretch for  
25 these mix of ethanol-like fuels through 2015, but in

1 2016, we see a large jump to Brazilian Ethanol and then  
2 things like 2018 where we're seeing a large amount of BTL  
3 gassing that doesn't really exist in any commercial  
4 facility, you know, that certainly would raise more  
5 supply, potential concern, but is arguably far enough out  
6 in the future, 2018, that there is legitimately time to  
7 build that. But back to once again Mr. Brauetigam's  
8 comments earlier about, well, are you assuming there's  
9 BTL gassing and diesel for 2012? No. Zero. Were you  
10 assuming for 2013 some in the U.S.? Yes. Should we  
11 reconsider that? That's probably a good suggestion  
12 because, if that construction hasn't started yet, how  
13 could it be there in 12 months? So, I think because some  
14 of these EIA forecasts, should you go back and look at  
15 that especially in the early years for those fuels that  
16 don't exist, but I think these other traditional fuels  
17 and even the import biodiesel, that's -- but let me just  
18 go over to the biodiesel side, Jay -- we are showing an  
19 awful lot of used cooking oil and even some corn oil down  
20 here, so used cooking oil, I mean, that's the feedstock  
21 one would use to create the biodiesel. Now, are they  
22 going to do that in this kind of quantity? That's a  
23 legitimate question. But I think soy, that's available,  
24 albeit expensive, and the Tallow renewable is actually in  
25 relatively small quantities, but we are showing BTL

1 diesel here in 2013, and starting a bit more there. So I  
2 think these fuels, especially in 2015, so I think you get  
3 into an earlier time of potential concern on the  
4 availability on the diesel side than you do on the  
5 gasoline side.

6 MR. MCKEEMAN: How about renewable diesel? It  
7 doesn't look like it's included.

8 MR. SCHREMP: That's this multi-color inedible  
9 Tallow renewable diesel --

10 MR. MCKEEMAN: Oh, I got it, right.

11 MR. SCHREMP: We're showing it from this  
12 feedstock because it's one of the lowest carbon intensity  
13 materials. But, yes, clearly in 2017, you go from here  
14 to here in California, that's a huge jump. And even the  
15 corn oil biodiesel at this point in time, you have to  
16 assume that you're taking that away from other uses of  
17 corn oil -- cooking oil, for example -- and that this  
18 would be a higher use.

19 MR. MCKEEMAN: All right, thank you.

20 MR. MORAN: Good afternoon, Ralph Moran with BP.  
21 Gordon, thanks for the presentation. A couple questions  
22 on Slide 11. You say there on your last bullet, or you  
23 say is one of your concerns there, the feasibility path  
24 of the cellulosic ethanol in the U.S. coming to  
25 California. And then on your very last slide of the

1 presentation, you talk about another concern, if other  
2 states enact a Low Carbon Fuel Standard. It seems like  
3 that's an important concern that we want to be moved from  
4 that last slide to Slide 11, just so all your concerns  
5 are in one place. But on that idea that if other states  
6 adopt a Low Carbon Fuel Standard, so if it's 3.7 times or  
7 about four times greater than California's market, I  
8 guess my quick math would mean that would leave a maximum  
9 of 20 percent available for California if everyone kind  
10 of split it up evenly. Does that make this case  
11 inoperable? Or what would be the effect of that?

12 MR. SCHREMP: Well, Ralph, we're using -- if in  
13 2018, we jump to 50 percent of EIA's outlook on  
14 cellulosic fuel in the U.S. and take it all here, that's  
15 much more than 20 percent. But even under those  
16 circumstances, you look into 2019, I guess the takeaway  
17 is that we're using 50 percent and it wasn't enough. And  
18 so, I mean, I mentioned I'm not sure if we used 100  
19 percent if we actually would get up to offsetting 20  
20 million tons of deficit, carbon deficit. So assuming no  
21 other LCFS programs anywhere else in the U.S., 50 percent  
22 didn't get you there, take 100 percent? Maybe. But now  
23 roll into what you're saying and competing elements, and  
24 saying California is only going to get 20 percent? Then  
25 you're back down to a much lower level because, for

1 example, if you look at some of the credit generation  
2 here, cellulosic gasoline is this light blue bar and so  
3 50 percent usage is getting you how much? So cut that in  
4 half. So you drop down a little bit, but you're still  
5 short. So will it make it more difficult to have  
6 sufficient credits? Yes, in this case we're showing.  
7 And it's not only a concern just for that, it would be a  
8 concern for these other type of desirable low intensity  
9 fuels, whether it's on the biodiesel side of the ledger,  
10 or whether it's on the ethanol side of the ledger, it  
11 would be increased competition for those because also,  
12 again, we're assuming 50 percent of the use in California  
13 some of those more expensive biofuels. So, right, if  
14 we're only using 20 percent, then these stacked credit  
15 bars would be lower than we're showing now. That's  
16 correct.

17 MR. MORAN: And in your costs, did you assume any  
18 additional cost for California to buy away that fuel from  
19 anyplace, from other states? Or at least any additional  
20 transportation costs?

21 MR. SCHREMP: Well, if the comparison is to, say,  
22 a person trying to comply with RFS2, and you're looking  
23 at sort of that competition dynamic, we're assuming  
24 there's a higher premium because of the Low Carbon Fuel  
25 Standard, you know, carbon intensity differential, that

1 you wouldn't necessarily see as an RFS2 participant.  
2 However, if I'm now comparing my demand for that  
3 competition with someone else in another state who is  
4 trying -- who has their own LCFS program, now there's  
5 someone on equal footing; there's both the recognition  
6 that it has a higher value because of its carbon  
7 intensity, that isn't fully recognized in the RFS2  
8 program. Now, they do have a cellulosic program that is  
9 lower in carbon intensity, of course. It does have  
10 higher value. They do have other advanced category that  
11 does show a RIN credit, higher value, and is a lower  
12 carbon intensity. So they almost have some sort of a  
13 more simplistic, de facto carbon intensity levels, but  
14 not to the degree that one could look at the array of  
15 fuels available. So, yeah, if you're competing, there's  
16 going to be competition with RFS2 compliance, no doubt,  
17 you know, Brazilian Sugarcane against other advanced for  
18 RFS2, biodiesel, cellulosic fuels, that competition is  
19 going to go on, so no, we haven't added a premium on top  
20 of our initial construct of here's a starting point,  
21 increase them with our rate of growth in the fuels, and  
22 then only give an LCFS carbon intensity value. So, no,  
23 we haven't further added a level of incremental  
24 competition against RFS2 obligated parties and against  
25 outside state LCFS parties, we haven't done that.

1           MR. MORAN: Okay. One last question on Slide 21.  
2 You say that California consumers and businesses are  
3 going to pay higher prices for gasoline and diesel due,  
4 first, to the more expensive biofuels, but also rising  
5 crude oil prices. Are you attributing higher crude oil  
6 prices to the HCICO provisions of the Low Carbon Fuel  
7 Standard, or something else?

8           MR. SCHREMP: The crude oil price forecast are  
9 what we've used in our price forecasting work that is  
10 part of our development of wholesale diesel and gasoline  
11 prices. I'm not quite sure, maybe Malachi or Jim could  
12 refresh my memory on the origin of those crude oil  
13 trajectories. Malachi? Jim?

14          MR. PAGE: Well, staff developed those oil price  
15 forecasts, I believe, this would be reviewing a variety  
16 of forecasts in the literature, EIA and others. The high  
17 case, high crude oil price case, is fairly steeply  
18 rising, it's not quite as high as EIA's high case, but  
19 it's fairly steeply rising. The low crude oil case is in  
20 real terms, is relatively flat. So you have the  
21 variation from basically flat real crude oil price  
22 forecast to a fairly steeply rising crude oil price  
23 forecast. Now, I think that's -- are you asking whether  
24 our crude oil price is rising?

25          MR. MORAN: No, well, it seems like this slide



1 here is discussing the impact on consumers of, I think,  
2 the Low Carbon Fuel Standard vs. RFS2. So rising crude  
3 oil price is independent, I mean, that doesn't seem to be  
4 applicable here. I'm assuming you're talking rising  
5 crude oil price is attributed to these policies,  
6 otherwise it wouldn't seem to be appropriate here.

7 MR. PAGE: I think we're just saying -- I mean,  
8 correct me if I'm wrong, Gordon, but I think we're just  
9 saying that we will be presumably paying higher prices  
10 for gasoline diesel because crude oil prices will be  
11 rising.

12 MR. SCHREMP: Yes, Jim, that's correct in part.  
13 I mean, we have a price forecast and certainly in the  
14 high price, low demand scenario, our prices for gasoline  
15 and diesel are forecast to rise. And it's some amount  
16 and it's in the information that was on the table out  
17 there, and so yeah, you're going to see higher prices.  
18 You're right, Ralph, I mean, looking and saying, well  
19 that's not in the differential here, and actually what we  
20 haven't done, but we've discussed doing, and we'll have  
21 this discussion also with the Air Resources Board, is we  
22 weren't including the total cost of the petroleum  
23 portions of the fuels when we did this comparative. So  
24 we've been talking amongst ourselves and that maybe it's  
25 more important to include all of the costs because there

1 is some petroleum displacement occurring because of the  
2 use of drop-in fuels that you don't capture some cost  
3 differential that's going on here. So, you're right, to  
4 stay on point of what is the difference between the two  
5 programs, it's really not the rising price of crude oil,  
6 it's the relative mix of the fuels and their relative  
7 cost, that's really where it's at.

8 MR. MORAN: Yeah, but it is true that the Low  
9 Carbon Fuel Standard, because of the way it treats crude  
10 oil, there would be either an increased cost to use high  
11 carbon intensity crude oil, and harder to sort of get  
12 your hands around if there would be increased costs to  
13 avoid it, as well.

14 MR. WENG-GUTIERREZ: Right. So regarding that,  
15 the original question did reference the HCICO stuff. We  
16 didn't include those, either the HCICO elements, the  
17 additional costs that could be attributed to HCICO, as  
18 well as things that are more near in terms of rulemaking,  
19 so things like the increased standard numbers, or some of  
20 the EER values that are still kind of up for debate, or  
21 still being reviewed. Those aren't in there. But as it  
22 becomes clearer, I think we should be able to incorporate  
23 some of those costs and things.

24 MR. MORAN: Thank you.

25 MR. SHEARS: John Shears, CEERT, Center for

1 Energy Efficiency and Renewable Technologies. I just had  
2 a clarifying question on Slide 6. I don't know if I  
3 missed it in your presentation earlier, Gordon. Can you  
4 explain why we have 2016 Midwest Ethanol completely like  
5 dips, then we have a slight surge, then it goes away and  
6 it comes back in 2027 through 2030? Could you elaborate  
7 on what's going on there?

8 MR. SCHREMP: Good question, John. It's in the  
9 assumption on what can happen with certain types of  
10 biofuel and renewable fuel availability. So, in 2017,  
11 those supply availability caps are allowed to rise -- so  
12 I'll toggle between the two slides here -- in 2017, you  
13 see a big jump in the biodiesel quantity and renewable  
14 quantities that generate an awful lot of credits because  
15 you've generated a whole bunch more credits than you did  
16 just the previous year from this, the diesel side of the  
17 equation, and it allows you to not need as many credits  
18 on the gasoline side so you can go back to using a bit  
19 more Mid-West for 2017. But it becomes increasingly  
20 challenging and you don't even want to use any Mid-West  
21 the very following year. So that's why there is this  
22 apparent jump is because the diesel and the low diesel  
23 volume was allowed to jump up rather dramatically from  
24 2016 to 2017.

25 And I think, John, one last point before your

1 next question, is that you'll see that when we give you  
2 the information on the credit quantities from year to  
3 year for this particular case.

4 MR. SHEARS: Yeah, I just wanted to make the  
5 observation that, given the immediately previous  
6 discussion around these issues, you know, and the  
7 assumptions that you're basing this theory on in terms of  
8 50 percent versus, you know, if all the other states were  
9 to adopt an LCFS, what this is suggesting within your  
10 model run here is there's a lot of flexibility to still  
11 comply, at least on credit generation. Because you're in  
12 a way over-complying through your renewable diesel credit  
13 generation. So, to me, it would seem to suggest that  
14 within the model scenario here, that there's a lot of  
15 room to maneuver if you can keep going back to higher  
16 carbon biofuels. So I just wanted to sort of posit that,  
17 given that this is a specific scenario run with a  
18 specific set of assumptions.

19 MR. SCHREMP: Yeah, and just to -- I mean, yeah,  
20 we recognized that, I think, you have more maximum amount  
21 of flexibility earlier in the program where some fuels,  
22 you know, as time goes by their carbon intensity value is  
23 not as great. Now, I know Mike Waugh and his staff have  
24 been looking at how some carbon intensities for specific  
25 types of biofuels can actually decline over time, and so

1   that's sort of a different dynamic that can continue to  
2   make them as desirable as they were, you know, a year or  
3   two earlier. So we think there is -- we agree that in  
4   the early years through 2015, 2016, sort of have a  
5   maximum amount of flexibility. And then later you're  
6   getting additional flexibility because of the mix of  
7   vehicle technologies that are in our forecasts, like  
8   especially PHEVs and the credits they generate, and the  
9   suite and quantity of cellulosic fuels that EIA is  
10   showing is going to be available, although we understand  
11   the comments about, well, you know, is that going to  
12   come? So I think you have different types of flexibility  
13   early on from the traditional fuels, and then as a  
14   growing -- as we're anticipating a growing supply of new  
15   fuels with really low carbon intensities, that now  
16   provides people with additional flexibility, as well as  
17   the technology and the credits being accrued by not all  
18   obligated parties available to sell to the obligated  
19   parties.

20           MR. WENG-GUTIERREZ: And I was just going to say,  
21   one quick comment -- this is Malachi -- is that these are  
22   -- it cost minimizes every year, so again, it's selecting  
23   those options which are the least costly.

24           MR. SHEARS: Great. Thanks.

25           MR. SCHREMP: Welcome.

1 MS. GREY: Gina Grey, Western States Petroleum  
2 Association. Ralph asked a lot of my questions, but I do  
3 still have one. We've been hearing through the  
4 presentation questions, again, regarding whether or not  
5 the assumptions that have gone into these scenarios are  
6 plausible, realistic, whatever the word is that you want  
7 to use, and you've obviously identified some that perhaps  
8 require further analysis. One thing that I didn't see  
9 that maybe is here and I'm not specifically seeing it, or  
10 is still to come, is an addressing of what you anticipate  
11 the cost of the credits from, say, the electricity  
12 sector, etc., to be. You talked about the increased  
13 price from a lot of the biofuels, etc. but not on credit  
14 purchase. So is that something that is still to come?  
15 And perhaps there could be discussions with some of the  
16 sectors that are maybe thinking of getting into the  
17 credit market? Or just to give us a range.

18 MR. WENG-GUTIERREZ: My intention was that -- so  
19 currently the way that it's calculating, it's calculating  
20 based on just the electricity cost, and that's the cost  
21 that is included in there. The credit cost is actually  
22 not included in there, but ideally it would be at the  
23 highest cost of that year for the biofuel that is  
24 complying, or some other way of estimating that cost, it  
25 would have a market price based on what the mix was that

1 year and what was the demand. So that's something we  
2 haven't included yet, but we're thinking about doing for  
3 those credits and seeing how to capture those costs.

4 MS. GREY: More to come. Thank you.

5 MR. MUI: Hi, this is Simon Mui with Natural  
6 Resources Defense Council on the phone. Are you taking  
7 phone comments.

8 VICE CHAIR BOYD: Just not yet, Simon. We've got  
9 one more gentleman standing at the podium and maybe  
10 others behind him. We'll get you.

11 MR. STEVENSON: This is Dwight Stevenson with  
12 Tesoro. And, Malachi, I think you've correctly stated  
13 the way that the market is going to determine the credit  
14 prices, so I will applaud you for that. And I would also  
15 applaud you folks for doing the big picture costs,  
16 societal costs. I think that's really important to  
17 understand. And I think, Gordon, you've obviously  
18 extracted out the incremental LCFS costs in that last  
19 slide, was it? And so you've got those as the increment  
20 on top of the RFS cost, and it seems like one of the --  
21 and you've got so much stuff to digest, I don't think I'm  
22 going to be able to do it in the meeting, it's going to  
23 take some time. But one of the questions you ought to  
24 answer I think is, so what is the RFS cost? And that's  
25 maybe going to be a big number there, I would guess.

1 Thank you.

2 VICE CHAIR BOYD: Gordon, you look like you're  
3 over there calculating.

4 MR. SCHREMP: Well, Dwight, I mean, we do have --  
5 I guess you could say we do have a cost for the RFS, and  
6 then we have a cost for the LCFS, and then what I'm  
7 showing is the differential, essentially. However, that  
8 was really on the biofuel side, the mix of biofuels being  
9 used. And so, yeah, and this is what we've talked about  
10 internally and will continue dialoguing with ARB is,  
11 okay, so we're using certain assumed prices for CARBOB  
12 and CARB Diesel, so we can actually construct the total  
13 cost of finished fuels for a particular year that are  
14 proportional share for RFS2, and then we'll do our LCFS  
15 and you could do the difference between the two, so it  
16 would include the whole cost of each. So that would be  
17 part of our cost analysis that we haven't shown you yet.  
18 But, yes, we can show you that, yes.

19 MR. STEVENSON: Okay, thanks. And another  
20 question that came to mind, the biodiesel prices that you  
21 showed looked to be \$2.00 to \$2.50 a gallon lower than  
22 what we're seeing right now?

23 MR. SCHREMP: I think there is a couple of  
24 dynamics going on. The prices of biodiesel, it's our  
25 understanding, are reflecting a dollar a gallon blender's



1 credit that a seller of biodiesel is seeing because they  
2 realize the purchaser is going to be getting that dollar  
3 off; so, in essence, it's being sold at a dollar higher.  
4 So we sort of looked at biodiesel as, okay, what's the  
5 sort of net cost to the user, and this would be analogous  
6 to we understand that you're going to get a credit for  
7 blending ethanol so a seller can sell at a higher price,  
8 and a user will see a lower net cost because you take  
9 into account that excise tax being excused. So we've  
10 looked at those prices and, yes, they look at a  
11 difference of like \$3.00 a gallon, so that's you could  
12 say about \$2.00 a gallon. I think in our high price, you  
13 will see a premium close to that, what the market is  
14 showing after you've removed the dollar a gallon  
15 blender's credit. But I think on the low side, that  
16 differential which is derived from 2010 data is much  
17 smaller than what's in the market now, in 2011. So  
18 that's like I said, we believe the high price, low demand  
19 scenario is the more real world case to focus on, rather  
20 than the opposite.

21 MR. STEVENSON: I feel like I didn't eat my  
22 *Wheaties* today, Gordon. I can't quite digest everything  
23 that you're putting out there, but I'll take some time  
24 and do that. So you don't include the blender's credit?  
25 Or you do? You're still including a blender's credit

1 even though it's going to go away this year?

2 MR. SCHREMP: That's one we look at and so the  
3 economists will tell us that, okay, when it goes away,  
4 what happens? Do prices still stay the same? It falls  
5 by \$1.00? Falls somewhere in between? Those are the  
6 same kinds of discussion, debate, and analysis associated  
7 with things like -- I mean, this is a very good question,  
8 Dwight, because what else is in play? Well, what else is  
9 in play is the import tariff, the ethanol blender's  
10 excise tax credit. So remove these kinds of supports and  
11 the market clearing price will settle somewhere. So  
12 right now, CBI Ethanol has an advantage because, frankly,  
13 the import tariff. Remove that and what's going to  
14 happen to the CBI producers? Well, they've already sent  
15 letters to Congress to the effect explaining what's going  
16 to happen to their business. And so Brazilian Ethanol  
17 and hydrous will make its way directly here, no stop and  
18 go and no paying \$.4 a gallon import tariff. So, right,  
19 that changes the price and makes it even more attractive  
20 as a low CI material, so those are good points, what is  
21 set to expire and will it? The \$64,000 question. And,  
22 yeah, how long have I been looking at the expiration of  
23 the excise blender's tax credits? Since about early  
24 1980's. But, yeah, that's a good point to look at and  
25 how would that affect the relative biofuel values we've

1 elected to use, Dwight, and as a consequence this kind of  
2 analysis. So that's a good question. Jim?

3 MR. LYONS: I think some of my concerns just got  
4 answered. I guess with respect to the tax credits and  
5 tariffs and things like that, if you could make it  
6 crystal clear what your assumptions are when you release  
7 the information tomorrow, that would be greatly  
8 appreciated. And I think I heard you say that you're  
9 going to also release the results of the RFS2  
10 Proportional Compliance scenario that you're using as  
11 kind of your baseline? Did I hear that correctly?

12 MR. SCHREMP: Yes, the volumes of the fuel by  
13 year for the cases, yes. We're doing that.

14 MR. LYONS: Great. And then the cost you  
15 estimate --

16 MR. SCHREMP: The cost, I think we're going to be  
17 holding up and providing that; we still want to interface  
18 with ARB in how we're assessing the RFS2 and LCFS total  
19 cost, and the differential, what we're including in that  
20 assessment and what we're excluding. So I think we still  
21 have some work to do interfacing with ARB staff before  
22 we're going to be there. So, no, that cost stuff won't  
23 come out tomorrow, but the volume, the RFS2 volumes,  
24 proportional share, the credits, the various fuels by  
25 volume and by case, that will all be there.

1           MR. LYONS:   Okay, then one final question.  
2   Double-sided page with the micro font on it, those are  
3   cents per gallon on a volumetric basis and there's no  
4   adjustment for energy equivalence?

5           MR. SCHREMP:   That's correct.

6           MR. LYONS:   Okay, thanks.

7           MR. HEIRIGS:   Hi, Phil Heirigs from Chevron.  
8   Just a real quick question on this one.   These cost  
9   estimates, they assume a shortfall in terms of  
10   compliance, correct?   I mean, you didn't try to make up  
11   for that shortfall with credits in any way?

12           MR. SCHREMP:   Phil, that's a good question and I  
13   think we've talked about this internally, we'll fill in  
14   that gap with excess credits.   I mentioned that's  
15   something that can happen, excess credits will be  
16   generated and they will have a market clearing value that  
17   will fluctuate, they can be used by obligated parties to  
18   close some of this gap.   We don't think, though, that it  
19   would be a bit of a stretch based on what's going on so  
20   far in 2011 to say that there's going to be 10 million  
21   tons of credits sitting around in 2014.   I would be  
22   shocked and amazed, but I can be shocked and amazed.  
23   But, yes, you can purchase credits, they will have a  
24   positive cost, and what that is, as Malachi is  
25   mentioning, what is sort of setting the market clearing

1 value on a per metric ton basis in the LCFS credit  
2 trading arena, and that's how you can say, okay, well,  
3 that's what the values will be to try to fill some of  
4 that gap. But you're right, that's one way of saying,  
5 well, yeah, you can comply and here is sort of a cost  
6 estimate to try to fill the gap, or that would add to  
7 that sort of comparative of LCFS vs. RFS2.

8 MR. HEIRIGS: Yeah, and then, yeah, good. Thanks  
9 for that clarification. So then on that other bar chart,  
10 there was no attempt to try to fill the gap, that's just  
11 the cost of this curve here?

12 MR. SCHREMP: That is correct. There was no  
13 attempt to do other things to reach full compliance with  
14 LCFS.

15 MR. HEIRIGS: Okay, perfect. Thanks.

16 MR. WENG-GUTIERREZ: Although we did talk about  
17 it and we actually kind of set it up to do that, we ended  
18 up not doing it just because of the, yeah, uncertainties.  
19 But also on that, I mean, ARB I think is discussing some  
20 alternative compliance mechanisms, so I think they're  
21 going to have some discussions about that and we'll see  
22 what those result in. Maybe that will influence how we  
23 handle this.

24 VICE CHAIR BOYD: Yes, we do have to get the ARB  
25 in here yet.

1 MR. WENG-GUTIERREZ: Right.

2 VICE CHAIR BOYD: John.

3 MR. SHEARS: John Shears again. I just can't  
4 help but note that my colleagues in the oil industry seem  
5 to be salivating over these cost numbers. I just want to  
6 make a note that we're talking about, you know, a  
7 national and a state program that's trying to build a new  
8 industry, and we're having all these conversations about  
9 the costs of trying to build a new industry, but there  
10 doesn't seem to be any acknowledgement of the huge amount  
11 of subsidy that goes to the mature industry that already  
12 exists. So I just want to make a note that, if we're  
13 going to go down this road, then we also have to talk  
14 about the current huge level of subsidies that the oil  
15 industry receives, Federal and State Governments. So I  
16 just want to flag that. If we're going to go down that  
17 road, then we have to acknowledge the other side.

18 VICE CHAIR BOYD: Simon, are you out there?

19 MR. MUI: Yes, can you hear me?

20 VICE CHAIR BOYD: Yeah.

21 MR. MUI: Okay. Sorry, I had two mute buttons.  
22 So, thank you for the presentation, Gordon, and I was  
23 listening to kind of *Gordon Schremp Goes to Washington*  
24 and I was wondering who Senator Paine, for you folks who  
25 have seen the movie. But, you know, I just kind of want

1 to make sure I understand sort of the overarching message  
2 that I'm getting from the analysis, Gordon, is that CEC  
3 doesn't believe the LCFS can -- or basically that the  
4 LCFS won't be met and is basically too expensive and  
5 probably won't spur additional alternative fuel  
6 production because everyone will just shuffle it in. You  
7 know, we had a lot of the analysis and I know you  
8 probably spent your bedtime reading our 15 pages of  
9 comments on it, and one thing I wanted to just say thank  
10 you was kind of on the case ones, and you talked earlier  
11 about it being kind of a "duh" scenario, kind of if  
12 there's no cellulosic, then ipso facto, no compliance  
13 with either the RFS2 or LCFS. So I kind of want to see  
14 that sort of explained a little bit more in the text  
15 going forward.

16 In terms of improvements, I think, to what you've  
17 done so far, certainly one area that I wasn't clear of  
18 during the presentation is, you know, about improvements  
19 in carbon intensity over time, not only from conventional  
20 biofuel producers, but also the other alternative fuel  
21 producers, including electricity, natural gas, and  
22 hydrogen because they receive credit to improve over  
23 time. The other question I had was regarding kind of the  
24 underlying assumptions, which I know it sounds like you  
25 have a little two-pager circulating, but in terms of the

1 potential -- if the LCFS credit is efficient in terms of  
2 providing that signal for additional investments,  
3 expansion in advanced biofuels production. So, you know,  
4 the short story is there's about 3.1 - 3.2 billion  
5 gallons of current potential; now, a lot of this is being  
6 proposed or under commission right now, there's really  
7 only 92 facilities globally that are in operation, that  
8 produce advanced biofuels. So kind of the fundamental  
9 question in my mind for CEC is, does the LCFS send the  
10 right signal for large-scale institutional investors,  
11 including oil companies, to invest more in expanding  
12 advanced biofuels, beyond the venture capital and private  
13 equity levels that you see, that are kind of more  
14 centered on demonstration plants. And if not, then what  
15 is the complimentary policy that CEC sees as necessary  
16 behind that?

17           The third kind of question that I have is on the  
18 HCICO portion, so it's probably no secret that NRDC and  
19 other environmental groups have been respectfully  
20 disagreeing with a lot of the oil companies on the high  
21 carbon intensity crude oil provision, but for better or  
22 worse, you know, ARB is proposing to give credits to  
23 activities to reduce upstream crude oil sources. You  
24 know, it would be very helpful, and I think I've raised  
25 this at the Advisory Panel to really evaluate what is the



1 potential because, obviously, there's a hell of a lot  
2 more crude and high carbon crude oils out there than  
3 there is alternative fuel, so to the extent that there  
4 are reduction opportunities there, it would be helpful to  
5 have that sort of evaluated and certainly, at least if  
6 you believe the Canadians, what the Canadians are saying,  
7 there's a lot of reduction opportunities that they can  
8 do.

9           And then, you know, cost numbers, just on the  
10 cost issues, sorry I'm just kind of throwing this all  
11 out, so hopefully you can take some good notes here, on  
12 the cost numbers, I was part of EPA in my previous life  
13 working actually on a RFS1 and 2 development, and really  
14 the cost numbers that you're showing here seem to defer  
15 from the cost model results that were developed as part  
16 of the DOE, USDA and EPA work as part of the rulemaking,  
17 so I kind of want to understand where these cost numbers  
18 are being estimated. Are they first of kind plants? Do  
19 you see these costs coming down beyond, you know, the Nth  
20 plant?

21           And then finally, you know, well, I'll just stop  
22 there and I think those four different issues I've  
23 flagged come to mind.

24           MR. SCHREMP: Well, thank you, Simon. I'll take  
25 a shot at responding to some of your points and

1 questions. Does the LCFS send the right signal? I  
2 think, you know, once the credit trading platform is up  
3 and then providing a signal to the market participant and  
4 what those credit values are, in conjunction with the  
5 fact that the LCFS over time becomes more challenging  
6 because, you know, the target gets lowered, that we  
7 expect those carbon values to increase. So it's  
8 speculation at this point what those opening values will  
9 be and what they'll be sustained for like six months or a  
10 year, how they'll fluctuate around, but that is the kind  
11 of market signal, if you will, that some investors can  
12 look at and say, "Okay, well here's some values early on  
13 in the program where it has lots of flexibility" -- you  
14 know, it was John Shears talking about how to comply, and  
15 later it's going to be more challenging and, i.e., likely  
16 higher carbon value. So I think that is going to be  
17 sending the right signal to investors on information that  
18 they can take to their eventual capital folks.

19 Improvement in the carbon intensity for specific  
20 biofuels over time, we understand the Air Resources Board  
21 staff has looked at that for things like the CI of corn-  
22 based ethanol. Their recognition in what's coming in in  
23 the 2A, 2B pathway submittals, and companies showing --  
24 demonstrating that they have a lower carbon intensity  
25 than the benchmark for that type of biofuel. And so we

1 understand what they're doing and their suggestion that  
2 that could decline over time through some of these  
3 improvements. No, we have not elected to modify the  
4 carbon intensity by biofuel for this analysis, and we  
5 weren't intending to do that in the future. And I just  
6 would comment that we believe that there will be  
7 efficiency improvements that have gone on in the  
8 industry, and whether that's in the biofuel production  
9 arena, whether that's in means of conveyance of material,  
10 whether that's in the production of gasoline and diesel,  
11 there has been continued efficiency improvements, all  
12 bottom line. But, of course, reduce my cost to save  
13 money at an appropriate level of capital investment that  
14 pays for itself over a certain period of time, then I get  
15 approval and I do it. And so that's been going on,  
16 Simon, so I think that if one is looking at improved  
17 efficiency that results in lower carbon footprints for  
18 certain types of fuel production, why stop there? Why  
19 not look at other production processes at the refineries  
20 that could lower it? Because I know the Air Resources  
21 Board has looked at just what you mentioned as one of  
22 your points, high carbon intensity crude oil, and how  
23 that will increase the carbon intensity calculated  
24 lifecycle for gasoline and diesel, but that's based on  
25 the change in the mix of crude oils being used. So I

1 think that, you know, we were not planning on changing  
2 our CI intensities for the fuels.

3           And I think the last point about upstream, you  
4 know, we haven't looked at that and I don't think we're  
5 appropriately equipped with the knowledge base and the  
6 resources to sort of look at what upstream potential  
7 there is for, you know, carbon capture and sequestration.  
8 You know, I don't know about that. I know those kinds of  
9 projects or reduced flaring have occurred in lots of  
10 other countries, but once again, economic reasons --  
11 either it makes sense to not flare the gas, collect it  
12 and sell it, or it makes sense because you have a flaring  
13 cost you're avoiding, or you have a carbon fee up in  
14 Alberta you're trying to avoid. So we know these kinds  
15 of reductions in carbon intensity of production are  
16 occurring upstream, but up to this point they have been  
17 occurring for economic reasons and justifications in  
18 capital deployed, so I just don't know about, you know,  
19 ARB has that in their proposal and we're curious like you  
20 what kinds of projects would comply with that and always  
21 sort of at what cost because what credits you can get and  
22 where can be the values of those credits. So those are  
23 really good questions you've asked, Simon, I just can't  
24 really answer a lot of them at this point.

25           MR. WENG-GUTIERREZ: And this is Malachi Weng-

1 Gutierrez. I just had a couple of comments that I wanted  
2 to make. One was, I know Gordon said we're not planning  
3 on incorporating it, but we definitely are looking at  
4 their process and their methodology, we want to look at  
5 the 2A-2B methods and see, you know, would it be  
6 appropriate to include and to what extent if we wanted to  
7 do that, so we are evaluating it to see how it would work  
8 for us, the CI comment or strategy.

9           And then, as far as -- although Gordon had  
10 mentioned that we haven't included any of the CI  
11 reduction elements in there, we have included it for the  
12 California CPIP Program facilities, so that is included  
13 in there currently. And then, just another kind of over-  
14 arching comment that currently what Gordon is presenting  
15 to you are two specific scenarios, we have run many  
16 others and they are different, so I think what we've  
17 tried to focus on are those that are of interest and  
18 those that are of interest that we want to present, and I  
19 think I'll leave it at that, but just be assured that we  
20 are looking at a whole slew of other scenarios.

21           MR. PAGE: I think I need to interject now. Mike  
22 Waugh has been waiting quite a while. I think we better  
23 proceed to that presentation. There will be public  
24 comments afterward.

25           VICE CHAIR BOYD: Right. I was about ready to

1 say the same thing, we've got to move on. So thank you.

2 So ARB.

3 MR. WAUGH: Good afternoon, Commissioner Boyd,  
4 members of the staff. Thank you for this opportunity.  
5 Fortunately, I just have a few slides today. First of  
6 all, I would like to commend your staff in how closely  
7 they've worked with us. I received an email from Malachi  
8 at 2:25 a.m. on Friday -- one would think that maybe his  
9 new baby had something to do with it, but that would  
10 discount his dedication to the IEPR, so I think he should  
11 get full IEPR credit for the 2:25 a.m. email.

12 VICE CHAIR BOYD: Can he sell those credits  
13 anywhere, though?

14 MR. WAUGH: Yes, we don't know how much they're  
15 worth yet, but we're working on that too.

16 A quick overview, we're going to talk about our  
17 review process underway right now, our illustrative  
18 scenarios, economic analysis, and our next steps.

19 I presented this slide last time. You know, the  
20 regulation requires us to do two formal reviews, one by  
21 January 1, 2012, and that's what we're doing right now  
22 with the Advisory Panel, and another one within three  
23 years. The Executive Officer must convene an Advisory  
24 Panel, we have one, and we've met several times; we've  
25 got one more meeting this Thursday, it's about 40 people,

1 industry, environmental organizations, academia, and the  
2 like. The regulation identifies 13 minimum topics to  
3 review, including program's progress against LCFS targets  
4 and fuel availability and economic impact. So this  
5 formal review is the driver for our scenario and economic  
6 analysis effort, so that's why we're doing it is because  
7 it's part of our formal review.

8           We have illustrative scenarios. We had  
9 "plausible" in there, but last Advisory Panel meeting we  
10 were chastised for that, so we took "plausible" out, just  
11 to let you know. We included in our economic analysis in  
12 2009 staff report, we had five gasoline scenarios and  
13 three diesel scenarios. Right now for the 2011 LCFS  
14 review, we've got eight gasoline scenarios, there may be  
15 more, in fact, I think we might be up to 11 now, and we  
16 have six diesel scenarios.

17           Now I want to remind everybody that these  
18 scenarios are not projections, they are merely possible  
19 pathways. The LCFS is a performance-based standard, and  
20 therefore we're not proscriptive as to how you get there,  
21 and there is a multitude of pathways. As Malachi said,  
22 there are several pathways that they've looked at, and  
23 they can look at even more. But what these pathways do,  
24 what these scenarios do, they show a range of options  
25 that may be available to meet the LCFS.

1           Some of the key differences between our 2009 and  
2 2011 scenario differences, in 2009 we excluded costs  
3 borne by RFS2 because it wasn't there at the time, and  
4 now we're going to use RFS2 as a baseline case, much like  
5 CEC staff has done, and as Gordon showed, that's not  
6 really that straightforward, what is the RFS2 baseline,  
7 but it is there and it should be a baseline, where it  
8 wasn't there in 2009. For 2009, we included the tax  
9 subsidies, and in 2011, we're not including any tax  
10 subsidies. In 2009, we used the EPA cellulosic fuel  
11 projections and, as with CEC staff, in 2011 we are using  
12 EIA fuel projections.

13           In 2009, we varied the number of electric  
14 vehicles, fuel cell vehicles, among the scenarios we had  
15 some that had 500,000 ZEVs and a couple had a million,  
16 one that had two million. For this year, we held that  
17 number constant among the scenarios, so we didn't change  
18 it among the scenarios. In 2009, we just used fuels to  
19 show compliance and this 2011, we're also using the LCFS  
20 credits as part of the compliance approach.

21           For our gasoline scenarios, we've got some common  
22 assumptions, the number of EVs and Fuel Cell Vehicles  
23 increase over time. I said that they remain constant;  
24 they remain constant among the scenarios, but in each  
25 case, we are showing that the number of ZEVs increase



1 over time, much like what CEC is showing. And, again,  
2 we're using LCFS credits as a compliance tool.

3           The key variables include the volumes of corn  
4 sugarcane and cellulosic ethanol. We have some scenarios  
5 that have quite a bit of sugarcane ethanol, we've got  
6 some that have very little sugarcane ethanol. We also  
7 have some drop in fuels for some of the scenarios and, as  
8 far as fueling for FFVs, some we fuel 50 percent on E85,  
9 some up to 100 percent. I think CEC staff has 50 and 75  
10 percent, so that is another set of assumptions there to  
11 figure out how many FFVs you would need, assuming they're  
12 refueling on E85.

13           We do have some E15 in some of our scenarios and  
14 some we don't, so, again, that's just another toggle  
15 switch. These scenarios, I think could be considered to  
16 be different world views; if you think there's going to  
17 be E15, we've got a scenario for that; if you think  
18 there's going to be a drop in fuels, we've got a scenario  
19 for that; if you think there's going to be a lot of FFVs,  
20 we've got that too. So essentially, again, we were  
21 trying to be as diverse as possible with our scenarios.

22           For our diesel scenarios, the key variables are  
23 the volume of alternative diesel streams and the later  
24 years require more lower CI alternative diesel, and we do  
25 have some drop in diesel for a couple of scenarios. In

1    this case, you know, the lower CI diesel, biodiesel,  
2    renewable diesel streams come on line later in the  
3    decade.

4           Our economic analysis, as you've already  
5    determined from what CEC staff has done, it is assumption  
6    driven. You know, we make different assumptions, you get  
7    different results. I believe Gordon said that. Our  
8    economic analysis is not exhaustive, there's no macro-  
9    scale analysis in terms of, you know, this is going to  
10   affect the petroleum sector this much, and the Ag sector  
11   that much, you know, that's beyond the purpose of our  
12   economic analysis right now. We've had a couple people  
13   mention that we don't mention the value of health  
14   benefits included, or avoided climate change cost, that  
15   again is above and beyond the scope of what we're doing.  
16   I think a more extensive economic analysis would have to  
17   at least discuss those items.

18           What we're planning to do, and this is what we  
19    said when we set out on the Advisory Panel, that we would  
20    update our 2009 economic analysis. We would update --  
21    the things that I know need updating would be feedstock  
22    cost, the petroleum-based fuel costs, costs of  
23    production, it's a cost of production basis, and it would  
24    have to include LCFS credits.

25           This next slide is the approach that essentially

1 we were following, a similar approach to what CEC staff  
2 was doing. We got some feedback from some stakeholders  
3 saying, you know, I wouldn't know -- it was feedback from  
4 a couple stakeholders, and I'll go into a little detail  
5 here. First of all, there is some indication of CI value  
6 in the market, that's true, that's absolutely true. What  
7 that is, you know, we don't know. We again -- we're  
8 looking at relative prices of biofuels based upon their  
9 CI, much as what CEC staff was doing. In fact, we were  
10 working together on that approach. Some of the feedback  
11 we got was that, well, you need to take into  
12 consideration actual costs of production of the fuels,  
13 the downward pressure of market competition, innovation  
14 spurred by market signals. And essentially they were  
15 saying that, yes, there's a signal, but it's probably not  
16 linear, so you may be making 60 CI ethanol and not being  
17 paid for 60 CI ethanol. And currently that's true in the  
18 market today, we've heard that from a lot of biofuel  
19 producers, and that a lot of them feel that they're not  
20 getting what they consider to be their value in the  
21 market right now. Now, we understand there's a weak  
22 signal right now in the market, so that might tighten up  
23 as the LCF goes along.

24 One of the things I want to say right now is that  
25 we're open to a more elegant economic analysis. I think,

1 again, for the purpose of our formal review, we're going  
2 to do what we said we'd originally do, which is update  
3 our economic analysis from two years ago; however, we  
4 think we're going to continue to look at the economic  
5 analysis. I don't know, Gina, whether we're going to do  
6 an economic analysis every year, but I can certainly say  
7 that next year we'll be continuing on the economic  
8 analysis, and I think that we're going to consider some  
9 more of the price signal and also some of the other  
10 things that we've been told by stakeholders. In fact,  
11 Gordon had said that, you know, when the subsidies go  
12 away, who knows where the price is going to land. We had  
13 a discussion with somebody in the biofuel production  
14 arena and posed that question, and the response that we  
15 got was, "That's a very good question. We don't know."  
16 So, they don't know, we don't know. I think Gordon is  
17 right, it's going to find its market signal somewhere.  
18 It may not be the full value of the subsidy, and it may  
19 not move at all, or it may move some, but those in the  
20 know actually don't know.

21           Next steps. We've got an Advisory Panel meeting  
22 this Thursday, 12:30 to 5:00 in the Sierra Hearing Room.  
23 The agenda is going to be our illustrative scenarios and  
24 economic analyses, so a lot of the questions that were  
25 asked today will be asked on Thursday. A lot of the

1 questions about what we're doing will be asked on  
2 Thursday, although I would take questions today, a lot of  
3 those questions will be asked on Thursday and we'll have  
4 a lot longer time to discuss them.

5 Overall, we've got a Board hearing on Friday,  
6 December 16th at 9:00, we've got two items, one is a non-  
7 Reg item which we will present to the Board the formal  
8 review paper that we have done with input from the  
9 Advisory Panel, and also a Sustainability Work Group  
10 update. The second item is actually a Reg item, it is  
11 our Proposed LCFS Amendments going to the Board.

12 Here's contact information. I never put my own  
13 name up there, solo, I always put my manager's and  
14 indicate that, as any good manager, please call my staff.  
15 I'll take any questions you may have.

16 VICE CHAIR BOYD: Thank you for toughing it out,  
17 Mike. Questions from the audience? There's an advantage  
18 to being late in the day.

19 MR. WAUGH: That's true and I --

20 VICE CHAIR BOYD: Or they're saving themselves  
21 for Thursday.

22 MR. WAUGH: They're saving themselves for  
23 Thursday. I don't think they want to tip their hand,  
24 perhaps.

25 VICE CHAIR BOYD: Any questions on the phone for

1 Mike? Wow. You get off easy *today*.

2 MR. WAUGH: Well, that's nice, today.

3 VICE CHAIR BOYD: Thank you very much.

4 Mr. WAUGH: Thank you.

5 VICE CHAIR BOYD: I guess we'll go to public  
6 comment. Any folks in the audience here have anything  
7 they'd like to say? I figured you didn't tough it out  
8 this long, Chuck, without having something to say.

9 MR. WHITE: I'm getting up with some trepidation,  
10 knowing I'm keeping everybody past 5:00. I guess I'll  
11 probably can my half an hour presentation that I was  
12 going to make. Just to make a few points, you know,  
13 actually, I was wondering if I was in the wrong meeting  
14 today because I was looking where natural gas is, and I  
15 finally found that little orange spot on the top of those  
16 bars that looked as an opportunity. And I guess the  
17 points I wanted to make today, and I'll just make them  
18 briefly, and I will submit comments in writing for Waste  
19 Management -- by the way, I'm Chuck White with Waste  
20 Management.

21 There are a number of barriers to expanding  
22 natural gas usage as an alternative transportation fuel  
23 and also biomethane as a substitute for fossil natural  
24 gas, just a number of them, we need more natural gas  
25 engines available on the market from the various

1 manufacturers and I will expand in comments on that, but  
2 right now we're limited in our options and if we can  
3 somehow promote more natural gas engines, I think we have  
4 the Chassis, we have the different type of applications,  
5 but we would like to have a better array of engines.

6           The problem with natural gas is you have to  
7 completely change out from your existing fuel and vehicle  
8 infrastructure to a new fuel and vehicle infrastructure.  
9 And, yes, the cost of natural gas on a per Btu basis is  
10 much less than traditional gasoline or diesel, but the  
11 transition cost of vehicles and the fueling  
12 infrastructure remains high. And Waste Management is in  
13 the process of converting its basically 3,500 vehicles in  
14 California to natural gas, we're about a thousand  
15 vehicles there, we did our thousandth vehicle this  
16 summer, and we are going to continue doing it, but the  
17 problem is finding the available capital to buy the new  
18 natural gas trucks, and to buy the new fueling  
19 infrastructure -- it's expensive. And that basically  
20 provides the slowing down of how quickly we can  
21 transition and find the capital to make those costs, so  
22 to the extent we can get grants and funding to help move  
23 this forward, that's very helpful.

24           Biomethane development, I've been hearing all  
25 afternoon how much more expensive these alternative

1 biofuels are, well, biomethane is actually cheaper than  
2 diesel right now. The problem is it's more expensive  
3 than fossil natural gas, and so that's who you're  
4 competing with when you go in to invest in new biomethane  
5 projects. Really, one of the major barriers to  
6 biomethane in California is in the inability to wheel it  
7 through the pipeline. There are about 20 high Btu  
8 methane projects around the country, there are zero in  
9 California, there are just simply none. And there needs  
10 to be a way that we can use the existing pipeline system  
11 to distribute biomethane more effectively, more  
12 efficiently, at lower cost.

13           People have been talking about the RFS2, the Low  
14 Carbon Fuel Standard, you cannot go to a bank right now  
15 and ask for a \$20 million loan to invest in a biomethane  
16 or basically any other project, based upon the revenue  
17 you think you're going to get from the RFS2 or the Low  
18 Carbon Fuel Standard, there isn't a bank in the world  
19 that will fund a program if that's what you need to make  
20 money, compared to the competitive alternative, which in  
21 our case is fossil natural gas. We like fossil natural  
22 gas, we're going to use it, but ultimately we want to  
23 transition to biomethane. So the way to speed up the  
24 transition is, as this Commission is doing, through  
25 things like AB 118 funding to provide additional capital



1 costs to invest in those projects, betting on the come  
2 that there is going to be a value to the RFS2, the Low  
3 Carbon Fuel Standard, that it is really dependable. No  
4 one knows what the RFS2, what the Low Carbon Fuel  
5 Standard is going to look like in two, three, four, or  
6 five years. There's a multitude of lawsuits, there's  
7 tremendous uncertainty about all these programs and how  
8 fungible they will be in the future.

9           One minor comment I want to make before I leave  
10 is on pre-landfill biomethane gas. This Commission in  
11 its wisdom, in its investment plan for AB 118, focused on  
12 only pre-landfill biomethane, which we support, it's a  
13 good idea to develop methane sources prior to the waste  
14 materials being put into a landfill. We understand what  
15 the reason is behind that; the problem is, as you should  
16 know, there is a whole lot of discussion going on, the  
17 fact that we need to get in-state biomethane resources  
18 into pipelines and one way to assist in doing that is by  
19 using AB 118 funds to help with the cost of putting  
20 biomethane, including treated landfill gas biomethane,  
21 into pipelines. So it would be helpful if this  
22 Commission could reconsider whether or not you just  
23 really want to limit it to pre-landfill biomethane  
24 projects, or also consider landfill bio -- if they can be  
25 shown to be at least or more cost-effective than pre-

1 landfill biomethane projects. We really think that the  
2 low hanging fruit right now is totally undeveloped  
3 resources in landfill gas and those landfill gas  
4 resources that are currently being used to generate  
5 electricity, they may be required to shut down to meet  
6 Air District Criteria Pollutant Standards because of the  
7 on-site Criteria Pollutant Emissions from the engines  
8 that are currently being used, those Emissions Standards  
9 are getting tougher. It would be better just to treat it  
10 and put in a new pipeline and wheel it to either to meet  
11 the Low Carbon Fuel Standard, or to meet the RFS.

12           And basically, in general, beyond just  
13 biomethane, waste-based fuels, as I repeated many times  
14 in the same room before the Commission, are really your  
15 lowest carbon fuel standard. We can get down to below  
16 zero carbon intensity on waste-based fuels. And I won't  
17 go into the details today, but, really it is a tremendous  
18 opportunity, and so I would urge this Commission to  
19 really focus on encouraging the development of waste-  
20 based fuels. If you look at the Low Carbon Fuel Standard  
21 look-up tables that the Air Resources Board has developed  
22 so far, what are the lowest carbon fuels there? And  
23 they're all waste-based fuels. So thank you very much.  
24 I appreciate the brief opportunity and I will submit  
25 comments, and I hope you will think in more positive

1 terms and maybe in two or three years, we'll see that  
2 little orange dot at the top of those bars that looks  
3 like natural gas be a little bit bigger than is projected  
4 today. Thank you.

5 VICE CHAIR BOYD: Thank you, Chuck. Some of us  
6 are working hard to make that orange dot bigger, and in  
7 other forms as you know, there are all kinds of  
8 activities underway to try to knock down the barriers,  
9 the myths, and what have you, related to all those other  
10 fuel types you reference. So we're all working on it.  
11 The trouble is I'm running out of time. Anyway... Anyone  
12 else? Mr. Moran.

13 MR. MORAN: Good afternoon, Ralph Moran with BP.  
14 A comment for both staff and for Mike, because it seems  
15 like you're both looking at evaluating the incremental  
16 cost of the Low Carbon Fuel Standard above the RFS2,  
17 which is good and necessary, but it really doesn't mean  
18 anything unless you also calculate the incremental  
19 benefit of the Low Carbon Fuel Standard because I'm sort  
20 of concerned that, when we talk about the benefits of the  
21 Low Carbon Fuel Standard, we act as if the RFS2 doesn't  
22 exist, so we're talking about all this petroleum  
23 displacement and incentive for innovation, but it's  
24 questionable how much of that actually exists above the  
25 RFS2. So if you're going to calculate the cost and, you

1 know, I guess that means sort of a cost benefit, you need  
2 to know what those benefits are and what you're actually  
3 getting for that incremental cost. Thanks.

4 VICE CHAIR BOYD: Anybody else? Do you have any  
5 phone public comments? Scott Richman, are you wanting to  
6 say something? So you have no hands raised, so to speak?  
7 Okay, Jim, do you have any concluding comments you'd like  
8 to make?

9 MR. PAGE: Just that we will take written  
10 comments for I guess two weeks, although given the  
11 schedule of the IEPR, probably the sooner, the better.  
12 But I do want to emphasize that this is certainly an  
13 ongoing topic and staff are always willing to talk. We  
14 have our staff report which is on a much slower deadline,  
15 so any information we can get, we will take, and gladly,  
16 especially now that Gordon has agreed to work weekends  
17 for the rest of his life, so we can do annual reports.

18 VICE CHAIR BOYD: He's trying to keep up with  
19 Malachi's 2:00 a.m. in the morning stuff.

20 MR. PAGE: Wants more of those credits.

21 VICE CHAIR BOYD: What good do they do you if you  
22 can't ever spend them? But, anyway, thank you to the  
23 staff, thanks to all of you for sticking it out with us  
24 this afternoon, and for your comments and your  
25 participation. As Mr. Page says, we're continuously open

1 to your input, your advice, your counsel, your comments  
2 in this very dynamic arena, on these various topics which  
3 I think will be real time hereinafter in the world in  
4 which we live. So see you next time. Thank you all and  
5 good night. Be safe out there. I don't know if it's  
6 dark or light anymore at this hour.

7 [Adjourned at 5:23 P.M.]

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**REPORTER'S CERTIFICATE**

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF,

I have hereunto set my hand this 1st day of December, 2011.

Kent Odell

Kent Odell  
CER\*\*00548