

Commissioners Present

Carla Peterman
James Boyd

Commission Staff Present:

Tim Olson
Jim Bartridge
Larry Rillera
Carol Tate

Agriculture Members Present

Karen Ross, California Department of Food and
Agriculture

Also Present (*on phone)

Panelists

Panel 1: Policy, Programs, and Investments

Dr. Glenda Humiston, United States Department of Food
Agriculture
Allan Morrison, California Department of Food and
Agriculture
Jim McKinney, California Energy Commission
Scott Nester, San Joaquin Valley Air Pollution Control
District

Panel 2: Agriculture Business Assessment

Mark Jenner, California Biomass Collaborative
Jack King, California Farm Bureau
Mike Marsh, Western United Dairymen Association
Michael Boccadoro, California Poultry Federation
Bryan Long, Foster Farms
Doug Dickson, Harris Ranch Beef Company

Panel 3: Biofuel Industry Assessment

Neil Koehler, Pacific Ethanol, LLC
Matt Hutton, Cal Poly San Luis Obispo Algal Biofuels
Brian Pellens, Great Valley Energy, LLC
David Rubenstein, California Ethanol & Power, LLC

Also present:

Mike Waugh, Air Resources Board

*Van Rainey

Mark Mayuga, Calmetha

Tim Douglas, local Delta farmer

Van Rainey, energy consultant

Dwight Stevenson, Tesoro

*Scott Miller, Wasted Fuels Conference

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

2 SEPTEMBER 22, 2011

9:07 a.m.

3 SECRETARY ROSS: Good morning and thanks for
4 being here. I'm Karen Ross. I'm Secretary of the
5 California Department of Food and Agriculture. I'm very
6 pleased to be able to co-chair this workshop today with
7 my friend and colleague and great champion for biomass
8 Jim Boyd who's Vice-Chair of the California Energy
9 Commission. And I will ask our other panelists to
10 introduce themselves before I make my opening remarks.

11 COMMISSIONER PETERMAN: Good morning. I'm
12 Carla Peterman, Commissioner at the Energy Commission
13 and I work with Vice-Chair Boyd on renewables and
14 transportation. I'm excited to be here and learn more
15 about the intersections of these subjects. Thank you.

16 MR. OLSON: Good morning. I'm Tim Olson. I'm
17 an advisor to Commissioner Jim Boyd.

18 MR. BARTRIDGE: Good morning. I'm Jim
19 Bartridge, advisor to Commissioner Peterman.

20 MR. RILLERA: And I'm Larry Rillera. I'm
21 Staff with the California Energy Commission.

22 MS. ROSS: So the one thing I want to do is
23 acknowledge and commend the leadership of Commissioner
24 Boyd for many years of being a champion of renewables,

1 especially with a focus on biomass. I'm not taking it
2 personal but this time you insist that you really are
3 going to retire but you do deserve a great round of
4 applause for your leadership.

5 [Applause.]

6 COMMISSIONER BOYD: You're too kind. You're
7 too kind.

8 MS. ROSS: And I also don't feel that I need
9 to make very many comments because if you read the
10 *Sacramento Bee* today you see that there is a column
11 there that really talks about the potential of biofuels
12 for California, specifically biogas and the fact that we
13 have a lot of cows in this state.

14 But the reason that I am personally very
15 interested in this topic is because I truly believe that
16 with the innovation and the capacity of California
17 agriculture with its productivity, that we are at a
18 moment in time where we can truly capture the potential
19 of biofuels on the farm through the waste stream that
20 has been generated by our processing and the byproducts
21 that come from our crops and that we can, in fact, not
22 only be food secure and feed secure, we can make a huge
23 contribution to being energy secure. That we can help
24 create jobs, that we can help create economic
25 development in some of the most depressed areas of our

1 state. That we can make a positive contribution to our
2 environment. And that it is all possible because we are
3 California and we have the diversity, we have the
4 resources, we have the innovation. I believe we have
5 the infrastructure. I know that that comes with
6 challenges and that's one of the reasons that we're here
7 today is to truly understand the challenges and better
8 identify the opportunities and create a roadmap for our
9 contribution from agriculture to helping with the
10 renewable energy portfolio of this state. So, I want to
11 thank you all for being here and I look forward to your
12 presentations. Commissioners?

13 COMMISSIONER BOYD: Thank you, Secretary Ross.
14 It's indeed a pleasure for me to be here. This has
15 been, as you stated more or less, a long steep grade
16 that we've been climbing in this state for a long, long
17 time and I'm very thankful for you and your agency for
18 this first time ever forum involving the two agencies.
19 As you and I have talked for quite some time when you
20 arrived on the scene about the nexus between agriculture
21 and energy. I'm glad we have had this opportunity to
22 initiate additional dialogue.

23 To your credit, you've already got a group
24 going and activities going on the dairy digester issue
25 as a standalone issue. But, as the more we've talked,

1 the more we've seen the need to talk about the overall
2 nexus between ag and energy; both from the standpoint of
3 the industry being a user of energy and needing supplies
4 of energy but also as an industry that has great
5 potential to contribute to the energy supply of the
6 State of California. Although we are the nation state
7 of California, we're just one of the 50 so we do have to
8 think about national policy as well.

9 I think that this is a good way for us to kick
10 off additional dialogue. The Energy Commission and the
11 Department have been collaborators for years, and for
12 almost the 10 years that I've been at the commission as
13 a Commissioner. I'm glad to see that we've taken it to
14 a new plateau and beginning to have some
15 stakeholder/public discussion together as we look at
16 this area.

17 The business to us in government, the business
18 opportunities seem significant. I hope that we can help
19 facilitate more discussion about that.

20 The last thing I'm going to mention is how
21 here finally in the 21st century, it's kind of innate to
22 say that you've crossed over a century mark, isn't it.
23 We understand better than we ever have the system
24 integration that we're dealing with. The fact that we
25 can't talk in isolation of a single topic any longer.

1 There's a great recognition as a result of, first the
2 years and years or energy security through energy
3 diversity that California has been in and out of going
4 all the way back to the first Middle East oil crisis.
5 But those go away when the price of oil goes cheap and
6 so in California it's been an environmental concern that
7 has driven an interest, in California, to alternative
8 fuels or fuels that used to be said burn cleaner than
9 gasoline and offered as a diversification.

10 Now we have the behavior of our citizens to
11 deal with, behavior of businesses and the behavior of
12 government to deal with. Government needs to
13 understand, more than it has in the past, the fact of
14 unilateral action is taken on a unilateral program, and
15 it really affects the entire system. As we sit here
16 today worrying about climate change, air quality,
17 security through energy diversity and feeding a better
18 business climate we recognize, I believe, that there are
19 many, many government policies that interact with this
20 and this is just part of the system. Everything from,
21 since we're just talking biofuels not biopower in
22 general or bioenergy, the policies of the federal
23 government with regard to renewable fuel standards, the
24 policies of California with regard to bioenergy,
25 biofuels, renewables, the low-carbon fuel standard, our

1 climate change activities and our clean fuels outlet
2 discussion - they all interact together. We have to
3 recognize that anything that we do here does involve
4 those other programs and those folks need to understand
5 that actions they take impact our various
6 constituencies. A forum like this with us working
7 together and absorbing some of the information is
8 definitely a very positive thing and I thank you for
9 your dedication to this subject in the face of all the
10 other firefight issues that arise every day that we have
11 to deal with.

12 I look forward to learning a lot, maybe a
13 leaving a little bit of education with folks, but
14 learning a lot more from the audience as to what we can
15 do in the future to address our societal needs but also
16 provide new opportunities for folks engaged in
17 agriculture. Thank you.

18 COMMISSIONER PETERMAN: Secretary Ross and
19 Commissioner Boyd have summed up the opportunities and
20 issues very well. I'll just take a moment to highlight
21 that the state agencies have been working
22 collaboratively in this space for awhile and one example
23 of that is the Bioenergy Action Plan which all the
24 agencies have participated in and lays out some of the
25 issues and opportunities. We'll be updating that. You

1 can find that just by Googling it and we look forward
2 to this workshop providing more information and guidance
3 as we move forward with that. Thanks.

4 COMMISSIONER BOYD: We are ready for our first
5 panel. And can I suggest one thing? You and I just
6 talked about the agenda a few moments ago. It indicates
7 a public comments section at the end of the day and I
8 talked to the Secretary and I think we mutually agreed
9 that I think we'd prefer to have comment at the end of
10 each panel so the subject matter is fresh and so that
11 people don't have to bottle every subject until some
12 discussion at the time. So, if we might Secretary, at
13 the end of each panel, I'll call them, we can ask for
14 any questions or comments from the audience throughout
15 the day.

16 SECRETARY ROSS: Great. So if we could have
17 our first panel Dr. Glenda Humiston who is the State
18 Director of the United States Department of Food
19 Agricultural Development Division. Allan Morrison from
20 the California Department of Food and Agriculture
21 Division of Weights and Measures. Jim McKinney from the
22 California Energy Commission and Scott Nester from the
23 San Joaquin Valley Air Quality Management District.

24 DR. HUMISTON: Good morning. Nothing like
25 being the first speaker. We'll get the glitches all

1 worked out with mine.

2 Okay. Great. I know that we're on a little
3 bit of a tight time schedule because we've shortened up
4 the day a bit so I'll try to hurry through these quickly
5 and hope that there's a few questions.

6 Basically, I just want to describe our
7 programs really quickly. For folks who aren't aware of
8 them, the Energy Title first showed up in the Farm Bill
9 in 2002 but was greatly expanded in 2008. Several new
10 programs, some of which have only been recently rolled
11 out in the last year or two due to time lag for rule
12 writing and getting programs up and running.

13 These programs are pretty broad bases, focused
14 on getting several programs going. So just to real
15 quickly show you a budget breakdown on the current USDA
16 Energy Title, as you can see, a big chunk of it is for
17 biorefinery assistance, programs for advanced biofuels
18 and then REAP, our Renewable Energy for America Program.
19 I'll give you a little bit more detail on these other
20 programs as we go along. Biomass, repowering
21 assistance, biobased markets all have smaller amount of
22 budgets there.

23 REAP is really our program for on the farm
24 efforts. This varies quite a bit, there's several
25 different aspects that I'll show you. \$255 million this

1 past year.

2 BCAP, our Biomass Crop Assistance Program,
3 which is not my agency but the Farm Service Agency, one
4 of our USDA families, is a little shaky now as far as
5 what it's doing and where it's going. We've got quite a
6 bit of funding available for research and development.
7 The Biorefinery Assistance Program is actually one that
8 we've made quite a bit of use out of here in California.

9 The Biobased Markets Program is for
10 improvements to existing programs. And then fuel
11 education, advanced biofuels - the U.S. Department of
12 Agriculture is currently working extremely closely with
13 the Navy. We have a memorandum of agreement with the
14 Navy to help them utilize 50 percent of biofuels by
15 20/20, a rather aggressive agenda on their part, and yet
16 we are well on track for that. And then repowering
17 assistance for existing ethanol plant boilers.

18 One key point that's important to make. The
19 demand for REAP has far outstripped demand available
20 funds every single year since its inception in 2003.
21 That's very true here in California. The other point
22 that I think is very important for people here in
23 California understand as we move into discussions on
24 Farm Bill and how the rules regulations on these
25 programs are written, is that the current rules are

1 written to greatly favor, as you can see, the Midwest.
2 This has a lot to do with a priority on efficiency which
3 evidently only replacing grain dryers in the Midwest
4 seems to satisfy as well as a focus on flexible fuel
5 pumps which, as you may know here in California, are
6 actually illegal. We have the ability to put in E 85
7 pumps and we have funded some of those pumps this year
8 but the true definition of a flexible fuel pump does not
9 currently meet California law. That's been a challenge.

10 For the programs that we invest in, we're
11 creating a little over 18 jobs per \$1 million invested.
12 This doesn't actually take into account the jobs created
13 in the multiplier around that as well as just moving our
14 U.S. future into a renewable energy and less dependence
15 on foreign oil.

16 To give you a sense of some of the work that
17 we're looking at right now with biomass, biofuels be it
18 ag or woody biomass, this is a slide that I put together
19 that we're using in the Northern Sierras as part of our
20 great region's industry cluster work to get folks to
21 look at the various opportunities available for biomass
22 and biofuels. Currently, the vast majority of that is
23 being utilized up there in combustion of woody biomass
24 for electricity. We're actually urging people to move
25 away from that. The cost, not to mention the

1 environmental reviews of getting transmission lines in
2 and, as much as I hate to say it, but the less than
3 stellar interest of organizations like PG&E actually
4 working with this, have made it so that we're
5 recommending to folks in woody biomass, ag waste,
6 municipal waste, to start moving to biofuels. And
7 really when you look at the overall efficiency component
8 of that, it makes more sense. Combusting this biomass
9 allows us to only harvest about 40 percent of its
10 energy. Whereas converting it into biofuels allows us
11 to harvest about 80 percent, roughly, and actually
12 produce a few byproducts that have their own value and
13 use as well. Not to mention the fact that there's just
14 a great number of jobs available as we move forward on
15 this.

16 I'm showing the woody biomass value chain here
17 but when you look at ag waste, and some of the
18 facilities we're currently working with, actually
19 putting together woody biomass, ag waste and municipal
20 waste together into the feed stock string, the potential
21 for value chain jobs is really enormous.

22 We're working with groups out there such as
23 the Dairyman who have identified this as part of their
24 overall effort as a key part of carbon reduction
25 projects and value chain opportunities and working with

1 partners such as our dairy industry here in California
2 is absolutely crucial to move all of the programs
3 forward and find efficiencies through that
4 collaboration.

5 Another really key project here in California,
6 our Agricultural Research Service which has three
7 offices here in California. The main one being in
8 Albany is cooperating—California is one of eight states
9 that has an agreement with ARS to rapidly commercialize
10 their research into their private sector. They're
11 working a partnership with the California Association
12 for Local Economic Development. Our USDA Rural
13 Development works really closely with attempting to
14 finance the activities and helping hook them up with
15 that local value chain effort. It's a really exciting
16 project and it's already producing some really great
17 work in the field.

18 Last but not least on broad overview, capital.
19 All of these projects that we're talking about require
20 capital. And even though we were able to bring in a few
21 million dollars via our programs in California last
22 year, we were able to finance grants of \$20,000 or less,
23 almost a half a million; grants over \$20,000 which was
24 predominantly three or four large ones at almost
25 \$700,000; a loan guarantee of \$1.5 million despite all

1 of that. That's only a few million dollars. That's
2 not going to build the industry that we need.

3 We've created a partnership with the Federal
4 Reserve Bank of San Francisco, a Financial Opportunities
5 Roundtable, which is looking at how to produce and
6 create better access to capital to actually harness the
7 billions of dollars that is needed in this state to
8 really create not only the biomass/biofuels industry but
9 tied into the agricultural value chain in general.

10 One project in particular that I'd like to
11 highlight though is the advanced biofuels. That's where
12 California really has the potential from some strong
13 leadership. We were able to fund over 11 producers last
14 year. One of which is kind of exciting. We have a
15 producer that is collecting the used oil from Knott's
16 Berry Farm in Disneyland quickly, nearby producing
17 biofuels that is then used by the rides in the amusement
18 park, and it's a closed system circuit. That's exactly
19 the kind of template we're trying to utilize in other
20 parts of the state as we work with woody biomass, dairy
21 producers, orchard trimmings, municipal whatever. That
22 kind of closed loop, short transport, minimum carbon
23 footprint system.

24 For the sake of time, I'm not going to go into
25 detail on these. My last two or three slides are just a

1 little bit of detail on the actual programs. This
2 information is on our website. In fact for folks who
3 aren't familiar with our programs, I truly urge you to
4 jump on our website. I've had my State Program Director
5 put together this PowerPoint with more detail, including
6 some photos of some of the projects and descriptions. I
7 like to see projects myself, it gives my imagination
8 that little nudge. But we do have the biorefinery
9 assistance, that's a big one that California has
10 utilized; advanced biofuel payment which is really
11 crucial in getting these initial projects into that
12 second stage. I have to say that the USDA programs,
13 this is the REAP Program that I mentioned early that's
14 grants and loan guarantees. This is for smaller type
15 projects, the REAP Project. We've also got renewable
16 energy systems, energy efficient improvements, energy
17 audits, renewable energy—I mean we've got several
18 programs. And some might argue that that many programs
19 is too many programs but when you really look at the
20 complexity of developing an industry, in some cases
21 almost from scratch, you really do need to focus on
22 those small little efforts, those medium sized, the
23 large, the initial stage R&D, the getting it into
24 commercialization and then the existing businesses -
25 keeping them viable and competitive.

1 So with that I'm going to close. Again,
2 we've got details on all of these programs online. I
3 know we were cutting down time today so trying to be
4 helpful. Is there a few questions that I might answer?

5 SECRETARY ROSS: Yeah. Just to go back to the
6 REAP Program, what kind of projects -because those are
7 on farm-what kind of projects are you seeing the most
8 interest in and you've been able to fund to make a
9 difference?

10 DR. HUMISTON: Well, we've got interest across
11 the board. The vast majority that we have funded tend
12 to be solar projects to replace diesel engines for
13 irrigation. That's been huge. That's probably half of
14 what we've funded. But our portfolio for the last
15 couple of years has been extremely diverse. We've
16 funded projects not only in solar but wind, geothermal,
17 algae and dairy digesters.

18 COMMISSIONER BOYD: Might I ask-and it's good
19 to see you again-we're supposed to be working more often
20 together, aren't we?

21 DR. HUMISTON: If our schedules ever find a
22 time.

23 COMMISSIONER BOYD: Right. The programs that
24 you were mentioning, do they divide between helping the
25 ag industry with its energy needs by using the newer or

1 different types of technologies that you referenced as
2 well as finding ways for the ag industry to create
3 businesses that create revenue streams and add to the
4 energy supply of the states, if not the nation? Do you
5 tend to do both in these programs?

6 DR. HUMISTON: On behalf of USDA I would say
7 yes. The Rural Development Agency of which I'm the
8 State Director focuses more on funding actual projects
9 but that's why we work so closely with our ag research
10 service which is doing that commercialization of service
11 and finding new and different ways. We work closely
12 with them on the farm and out in the forest on actual
13 projects. In fact we've got several out on the ground
14 right now that we're working closely with them to test
15 and move into commercialization.

16 COMMISSIONER BOYD: Thank you.

17 DR. HUMISTON: Thank you.

18 MR. MORRISON: Good morning. My name is Allan
19 Morrison. I am a Supervising Chemist for the Division
20 of Measurement and Standards which is part of the
21 California Department of Food and Ag. We have the
22 responsibility for fuels and lubricants sold within the
23 state.

24 As you probably know, California law requires
25 that DMS enforce fuel quality specifications. All fuels

1 sold today in California, both conventional fuels and
2 biodiesel fuels or biofuels, must meet either ASTM or
3 SAE standards. If you're not aware of what ASTM or SAE
4 are, they're consensus organizations where they bring
5 together industry, they bring together both producer-
6 people who make the fuel, distributor, pipeline
7 companies, transport companies and end-users such as
8 vehicle manufacturers and engine manufacturers along
9 with public interest groups such as government, consumer
10 organizations, universities and research laboratories.

11 The fuels that are currently legal to sell in
12 California are gasoline blended with ethanol, ethanol
13 blended with gasoline; we have diesel blended with up to
14 5 percent biodiesel and diesel blended with up to 20
15 percent biodiesel. We also have specifications on the
16 books with ethanol blended with gasoline fuels. We do
17 also have compressed natural gas and liquefied natural
18 gas specifications.

19 Any new alternative fuels that enter into the
20 market must go through the same process that the
21 conventional and existing biofuels have to ensure that
22 they do not cause harm to the engine, that there are no
23 safety issues and that the quality specifications are in
24 place so that producers can meet those and users can
25 specify those quality specifications.

1 Also, any new fuels that come onto the
2 market, as mentioned earlier, the devices to dispense
3 those fuels must be type approved by the California
4 Department Food and Ag Division Measurement Standards
5 has a type approval program. We have a staff if
6 industry has a pump or something like that, a blender, a
7 blender that they wish to use; they need to bring that
8 to us. We'll do an approval to ensure the accuracy of
9 that device because consumers, as much as wanting the
10 fuel, also would like to have an accurate delivery of
11 the fuel.

12 Another thing that the California Department
13 of Food and Ag Division of Measurement and Standards is
14 doing is that we're working with the California Energy
15 Commission to develop specifications and standards and
16 test methods for hydrogen for use in fuel cell vehicles.
17 We're also working at developing specifications for high
18 concentration biodiesel fuels. As I mentioned before,
19 there's currently specifications up to B20. We're
20 looking at B20 up to pure biodiesel of B100.

21 California Department of Food and Ag also
22 works with sister agencies. We work with ARB very
23 closely. We work with the Energy Commission. We work
24 with the State Water Board and also the State Fire
25 Marshall's Office because the fuel has to be safe.

1 Another issue, given the complexity of this
2 whole process of coming up with a fuel standard, CBFA
3 has developed what we call a Developmental Engine Fuel
4 Variance. That allows—if a fuel has sort of gone
5 through the process, and ARB says basically it does not
6 contribute to any air pollution, there's no safety
7 issues, we can issue a variance. If there is no
8 specification that currently exists for that fuel, we
9 can issue a variance for that variance to use to develop
10 those specifications. It's not a variance for fuels
11 that are out of compliance but it's for new fuels that
12 come onto the market, such as say if pyrolysis oil came
13 on as a diesel fuel or a compression ignition fuel, we
14 could possibly issue a variance for that to be studied.

15 One of the things that traditionally biomass
16 based fuels have had to compete with conventional fuels
17 mainly on a price energy—as price energy. There were
18 some uses of biofuels for reducing the specific air
19 pollution requirements such as CO particulates but, in
20 general, most engine manufacturers have found non-fuel
21 ways around that so they basically have taken
22 traditional fuels and found ways to meet the air
23 pollutions requirements with traditional fuels.

24 The low-carbon fuel standard which is coming
25 into play sort of shifts the paradigm. Now we need to

1 have fuels that have low-carbon intensity. Biofuels
2 are no longer in competition for energy. They're in
3 competition for lowering that carbon intensity. That
4 provides a tremendous opportunity for California.
5 California agriculture is probably the most diverse in
6 the country. We're used to growing different crops. We
7 do grow the most variety of crops in the nation. We're
8 also extremely close to centers of fuel use,
9 metropolitan centers, agricultures close to San
10 Francisco, close to Los Angeles and the Central Valley.
11 These factors will assist California in producing low-
12 carbon intensity biofuels.

13 As I said before, currently, biofuels also
14 have a unique opportunity in the realm of hydrogen and
15 electricity. You can use biomass based fuels to produce
16 hydrogen and to produce electricity. That tremendously
17 reduces the carbon intensity of those fuels and furthers
18 the goals for the low-carbon fuel standard.

19 And that's pretty much what we do within
20 measurement standards. If there's any questions, I'd
21 like to answer them at this time.

22 COMMISSIONER BOYD: A quick question. You
23 mentioned the variance program that you engage in. Is
24 all the present work that's being undertaken with regard
25 to hydrogen as a fuel which is really still a large R&D

1 exercise. Is the fueling that's taking place in that
2 arena today operating under a variance?

3 MR. MORRISON: No, it's not. Hydrogen was
4 unique. The California legislation gave us the
5 authority to adopt or to adopt specifications. One of
6 our chemists, John Mough, is in the laboratory developed
7 specifications that basically went out, went to
8 industry, got what they thought was good specification
9 and we put forth those in regulation. At that time it
10 allowed hydrogen to be sold under those specifications.
11 We're waiting—before adopting say consensus standards in
12 the law, it allows us to adopt consensus standard
13 specifications once they're developed and it just so
14 happens that the day before yesterday SAE finally
15 adopted that. We'll be changing from our specifications
16 to SAE specifications which are basically our
17 specifications so we helped them develop those.

18 COMMISSIONER BOYD: Thank you.

19 SECRETARY ROSS: Thanks Allan.

20 MR. MCKINNEY: Good morning, Secretary Ross,
21 Commissioners Boyd and Peterman and members of the
22 audience. I'm Jim McKinney, Manager of the Emerging
23 Fuels and Technology Office within the Energy
24 Commission. I'm going to try to situate this
25 conversation from the Energy Commission perspective and

1 tell you what we're doing on alternative fuels and
2 emerging fuels.

3 First of all, some nation state statistics.
4 We're a big state with the ninth largest economy in the
5 world. I think when I first did this slide we were at
6 number six but we keep slipping down the chain there.
7 Transportation sector accounts for over 40 percent of
8 the greenhouse gas emissions produced in the state. We
9 have an extremely large vehicle fleet, 26.5 million cars
10 with nearly 1 million trucks. And we use a lot of fuel,
11 18.3 billion gallons total. That's 15 billion gallons
12 of gasoline, 3.3 billion gallons of diesel that's for
13 onroad and offroad applications and, I think this stat
14 is still true, the third largest fuels market in the
15 world after China and U.S. as a whole. I think, as we
16 like to say, that's not something we're proud of because
17 of the fuel efficiency of our vehicles is abysmal.

18 So ethanol supply/demand stats for you. In
19 2010 we were using 1.5 billion gallons of ethanol. That
20 was primarily as a blending agent or an oxygen aide as
21 specified by the California Air Resources Board. I
22 think most people don't appreciate that this high amount
23 of ethanol we're using has very little if anything to do
24 with a low-carbon fuel standard or the renewable fuel
25 standard number two. It's really an air quality

1 additive we're using right now.

2 Ten million gallons was consumed as E85 and
3 flex fuel vehicles, that's a small number. Under some
4 scenarios for RFS2 Compliance by, say, 2015 the amount
5 of ethanol used in the state could rise pretty
6 dramatically. I think it might taper off as well.

7 On the supply side, we have five state-of-the-
8 art plants and I think some of the people who helped
9 create those plants are here in the audience today. 250
10 million gallon per year production capacity but it's a
11 very tough market. Two of those are offline and I think
12 some of the three that are operational are struggling.

13 It's a low-carbon product. It's 18 percent
14 lower than the ethanol that we get from the Midwest but
15 there's no market mechanism in California yet to value
16 the low-carbon value of these supplies. We're looking
17 forward to LCFS kicking in and RFS2 kicking and to help
18 end cap and trade to really help build a market where
19 the very low-carbon fuels that we can produce here in
20 California.

21 There's an oversupply of ethanol at the
22 national level and we're hearing hints of shuffling
23 between U.S. producers and Brazil. It's extremely hard
24 for our instate producers to compete with the economies
25 of scale that you can get with industrial ag production

1 out of the Midwest. And, again, I think we're going to
2 talk about that more today, in this forum, and again we
3 need these carbon markets to kick in.

4 On the biodiesel side, we used 14.5 million
5 gallons last year. That's typically blended at the B5
6 level. Soy is a predominant feedstock, that's about 12
7 percent below the petroleum baseline for diesel if you
8 include the indirect land use adder.

9 We view biodiesel as a transitional fuel. We
10 think renewable diesel is where it's going to be for
11 mass consumption. Biodiesel is not a staple product.
12 There are blending issues. There are stability issues
13 in cold temperatures. And you need additional
14 infrastructure to get it in there.

15 On the production side, 16 facilities, 84.5
16 million gallon a year production capacity. We only did
17 5.5 million gallons last year but in discussions with
18 some of the producers RFS2 on the biodiesel side in
19 kicking in and we expect to see production increase.

20 The Commission has three different parts
21 programs working on the biofuels, biopower area,
22 emerging fuels and the fuels division. Our renewable
23 office, they focus on biopower and PIER, Public Interest
24 Energy Research. I'm going to talk primarily about
25 emerging fuels and AB 118.

1 This was a modest assignment from the
2 legislature, put together about \$1 billion program
3 shared between us the Air Resources Board to jumpstart
4 and transition the California fuel markets to get us
5 into a position where we're really producing and using
6 low-carbon, sustainably produced biofuels.

7 There are several policy drivers associated
8 with this. GHG reductions as specified by AB 32 I think
9 you're familiar with the stats—about 30 percent below
10 the 1990 level by 2020 and then the stretch goal 80
11 percent reduction by 2050. Petroleum reduction, instate
12 biofuels production as was referenced by our Bioenergy
13 Action Plan. We are falling well short of the goals set
14 forth in the Bioenergy Action Plan for our instate
15 production capacity.

16 The low-carbon fuel standard is kicking into
17 gear. This is the first year of implementation for that
18 and then the big gorilla out there, the Federal RFS2
19 standards with its \$36 billion renewable fuel
20 requirement by 2020.

21 We are in the fourth year of administering the
22 AB 118 program and we've allocated \$340 million to date.
23 This table summarizes expenditures or encumbrances as we
24 call them as we're good bureaucrats for the first about
25 \$200 million in the first two year funding cycles of the

1 program.

2 You can see that about a third of our total
3 investments are going to biofuels, that's biogas, diesel
4 substitutes and gasoline substitutes. I'll talk more
5 about those in a little bit. Electric drive is really,
6 really coming out into the marketplace. A lot of the
7 OEMs have really exciting vehicles. The consumer
8 response is good. A large proportion of the volts
9 available in the U.S. are being placed here in
10 California and they're getting snapped up.

11 We fund hydrogen. We fund workforce
12 development and we do program support including
13 sustainability goals and standards for instate biofuels
14 production. This program is extremely popular, I think
15 as Glenda referenced, at the federal level. The first
16 solicitations that we put out, we had \$1.2 billion in
17 funding requests, over 300 proposals. We were able to
18 fund about 65 of those at the grant level for about \$200
19 million. And I'm very happy to see some of you folks
20 that did not win awards, that you're still here and
21 working with us on these issues.

22 Going to biofuels, biogas is getting almost
23 two-thirds of our total funding so \$35.3 million with
24 more modest investments in advanced ethanol feasibility
25 and pilot applications and then diesel substitutes.

1 We've also allocated a bit of money to CEPIP,
2 the California Ethanol Producers Incentive Program, for
3 the instate biorefineries. Some money for ED5 retail
4 fueling stations and some money for biodiesel bulk
5 terminal storage.

6 In the interest of time, I'm just going to
7 have to blitz through these but we're really excited by
8 the types of projects that we're doing.

9 Glenda mentioned RFS2, they're renewable fuel
10 standards, so they think an advanced biofuel is 50-60
11 percent below the carbon baseline. Pretty much
12 everything that we fund is about 15 grams, give or take
13 5-10, that puts us 85 percent below the carbon baseline.
14 These are extremely low-carbon fuels that we can produce
15 in the state with existing feedstocks. Again, the issue
16 is price and is there a market to value the really low-
17 carbon levels of those products.

18 So for biogas, everything that we're doing
19 such as waste based feedstocks, we have ag manures, ag
20 waste, woody biomass, landfill gas, pre-landfill
21 diverted municipal solid waste and wastewater treatment
22 plant residues.

23 To highlight a couple, and I'm sorry I can't
24 acknowledge everybody here, the CR&R Project down in Los
25 Angeles Basin is the first commercial scale project for

1 pre-landfill MSW. They're going to digest that
2 anaerobically and use it to fuel their waste hauling
3 fleet. Waste Management is going to do the same thing
4 on a very large scale with landfill gas in Ventura
5 County. They're going to have an annual production of
6 3.4 million diesel gallon equivalents that can fuel a
7 fleet of 500 waste refuse trucks in the LA Basin. So
8 you get GHG benefits and criteria emission reduction
9 benefits.

10 I think a lot of people keep waiting for
11 cellulosic ethanol to deliver on its promise and as it
12 fails to deliver on its promise at an economic price,
13 biogas is coming on very strong and that's why the
14 biogas projects, frankly, outcompeted the advanced
15 ethanol projects in our solicitations. So whether it's
16 a gasification, pyrolysis or anaerobic digestion, we see
17 this as a very quick and economical way to get advanced
18 biofuels into the transportation system.

19 One company I want to highlight is G4 Insights
20 who has a cold pyrolysis gasification technology that
21 they think can tackle woody biomass. That could us in
22 very large volumes of advanced biofuels.

23 For gasoline substitutes, we're finding there
24 projects, and again these are exciting cutting edge
25 technologies and applications. Cellulosic ethanol from

1 ag waste, AE Biofuels is going to have their first
2 pilot scale plant up and running; we're helping to fund
3 that.

4 The Mendota B Cooperative has a very
5 innovative projects. It's a combination of ethanol and
6 biogas from ag waste and sugar beets. It is a carbon
7 neutral, water positive project. It's really cutting
8 edge.

9 And I think Brian Pellens is going to speak
10 more today on sweet sorghum which we view as a very
11 promising alternative to corn for instate production.
12 It has a low water requirement and you can grow it on
13 marginal soils.

14 And then for the diesel side, three projects
15 are using ag waste streams and then two of our projects
16 are using algae as feedstocks.

17 I am not going to do justice to the PIER
18 program's excellent work on the R&D phase so AB 118
19 focuses more on pre-commercial and commercial
20 deployment. PIER, Public Interest Energy Research,
21 focuses on the R&D phase. This list of very strong
22 projects is about \$7 million, I think, all together.

23 Biomethane landfill gas for transportation
24 applications has a very important \$1 million study that
25 the Biomass Collaborative and CDFA are administering for

1 crop trials for alternative bio energy crops here in
2 the state. A lot of very exciting, cutting edge work
3 for algae, growing them either in waste ways or there's
4 an ocean application and cellulosic ag waste. I
5 apologize for not doing more justice for that.

6 I'm going to end with a couple of techie,
7 wonky charts here so bear with me please. This chart
8 shows the relative greenhouse gas carbon intensity
9 values for diesel so the far left green bar, diesel
10 about 95 grams CO2 equivalent per megajoule; that's the
11 current baseline. California reformatting gasoline is
12 about 96. So you can see LNG, we don't get a lot of GHG
13 benefits; CNG we got some modest benefits, about 20
14 percent. The action is down, again, in these waste
15 feedstocks that I've been talking about, so landfill gas
16 we're at about 82 percent below the baseline, CNG from
17 dairy digesters - 85 percent or 84 percent below the
18 baseline, biodiesel from used cooking oil, I think
19 that's probably what they're doing at Knott's Berry Farm
20 is the lowest commercially available biofuel available
21 on the market.

22 You can see soy would do a good job except the
23 indirect land use adder is high and it's significant.
24 And, again, the stuff that we're doing-RFS2, they're
25 looking for 50 or 60 percent reductions. Everything

1 that we're funding is in the 80-85 percent reduction
2 range.

3 My last wonky slide, and I apologize for this,
4 what this slide shows, and this is based on data from
5 the California Biomass Collaborative, is the technical
6 production potential for creating advanced biofuels from
7 the waste streams available in California. I'm not
8 going to read everything. If you go to the bottom right
9 rows, what that says is if you use gasoline gallon
10 equivalents, 2.5 billion gallons production potential,
11 1.75 diesel, DGE diesel projected so on the diesel side
12 that would be half of the current diesel demand in the
13 state. I said before we're using 1.5 billion gallons of
14 ethanol. This would exceed that by quite a bit.

15 Couple of things to highlight here. Landfill
16 gas, we think that's going to be cost effective pretty
17 quickly. Food waste that's easily converted and
18 anaerobic digestion, the ag residues that's a little
19 tougher hurdle with the woody biomass and the high
20 lignin content, animal manures—we've got some promising
21 technologies to get at that. And the big unknown here
22 that's kind of an outlier is forest biomass so the
23 Forest Service and Cal FIRE are estimating about 14
24 million foam dry tons a year and that's not green wood;
25 that's wood taken out of the forest to reduce fire risk.

1 So overstocking, diseased trees. It's expensive. It's
2 not economical yet and we think we have some
3 technologies in the pipeline that can economically
4 convert this.

5 And I want end this talk with Commissioner
6 Boyd's, I think, legacy, one of his legacies, with his
7 long tenure at the Energy Commission, he's been a
8 champion for this over the years and he's ensured that
9 our staff in the Fuels Division and in the Renewables
10 Office and in PIER continue to put money to converting
11 waste based feedstocks into viable, commercially
12 competitive energy products that can meet our air
13 quality standards and low-carbon standards. So that
14 concludes my presentation.

15 COMMISSIONER BOYD: Thanks, Jim.

16 SECRETARY ROSS: I have a question because we
17 were all very disappointed that we failed to get passage
18 of legislation to extend the Public Goods Charge which
19 obviously is going to have an impact, is it too early
20 for you to be able to categorize where we're going to
21 take the biggest hits for continuing this good work?

22 MR. MCKINNEY: I would like to graciously punt
23 that over to the Senior Commissioner at the dais.

24 COMMISSIONER BOYD: That's a—we don't know
25 yet, to be honest. First, we've not totally abandoned

1 hope that the PIER program or a PIER-like program will
2 yet be authorized through one mechanism or another. So
3 that's job one for us.

4 Job two, as we've told our employees, is don't
5 get disturbed by the fact that some people will be
6 working on that questions, "Okay. What do we do in the
7 future?" The money carries on for quite awhile, two
8 years of appropriation, several more years for total
9 exhaustion of encumbrances so we are now sorting out the
10 projects that we want to keep going, seeing if there's
11 any new projects that we can carry out even though
12 funding will dry out shortly, well theoretically they'll
13 be no more revenue after the end of this calendar year.
14 So we don't know. I'm glad you brought it up, at the
15 end, although half the audience would have been gone, I
16 was going to give a commercial for the value of the PIER
17 Program, Public Interest Energy Research, and the good
18 that we think that it does to try to stimulate various
19 forms of new businesses in California. For years and
20 years and years an awful lot of silent, almost, work as
21 that's the way academics tend to be has been done on
22 biomass, bioenergy by the Energy Commission's Public
23 Interest Research Program, an awful lot of it at UC
24 Davis and that still goes on at the Biomass
25 Collaborative sits over there and we'll hear from them.

1 Jim—because Jim mentioned it—something that I
2 didn't mention in my opening because I was waiting maybe
3 until the end of the day is just this emphasis on waste.
4 California has so much waste in the forest, in
5 agriculture and even urban waste, we've avoided talking
6 about energy crops and purpose grown crops for energy in
7 California for quite awhile because that's a real hot
8 button in various communities, possibility not correct
9 or not deserved. That's not a popular defense these
10 days.

11 The thing that we've been unable to do for
12 more than a decade, well probably two decades I've
13 worked on this issue, is monetize the values to even get
14 recognition of the values, what's more monetize the
15 values, of using waste. If farm communities can no
16 longer burn things in the field, there's an expense
17 associated with getting rid of that material so why not
18 put it to good use? Why not find a value for it? And
19 the same goes true for manure, for food—all the things
20 that we've talked about—food processing waste, forest
21 waste in particular.

22 As Glenda knows only too well, we had a
23 terrible time getting into the forest. There is great
24 fear among certain communities that today you will take
25 out the debris and tomorrow you will cut down a few

1 little trees and day after tomorrow, you'll whack down
2 the old growth forest and that's never been the
3 intention but it's hard to even get a footfall into the
4 forest to get at these materials. It's taking us time,
5 we need to monetize those values because governments
6 getting tired of subsidizing things and particularly in
7 these tough times. That's something that I hope comes
8 out of continuing dialogues like this, is recognition of
9 the value and monetizing those values so they can offset
10 the seeming higher costs associated with using the waste
11 stream. In the long run of it, I don't think there is a
12 higher cost but our system doesn't recognize that yet
13 and I hope you all can work on this.

14 This continued reference to my legacy today
15 which shouldn't have happened is the fact that I did say
16 that I was retiring at the end of this year. I've tried
17 two terms as Commissioner to get this thing off dead
18 center and maybe it's off dead center but on my working
19 watch I guess we're not going to totally cut all the
20 ribbons I'd like to have seen. In any event, thank you
21 for referencing it. You've got a lot of good people to
22 finish it.

23 MR. NESTER: Good morning. Greetings from
24 Fresno. I'm Scott Nester with San Joaquin Valley Air
25 Pollution Control District. As you know, San Joaquin

1 Air District and the Air Resources Board are
2 responsible under the Federal Clean Air Act for meeting
3 public health standards for air quality.

4 We have four basic functions at the San
5 Joaquin Valley Air District Planning: making up
6 regulations to reduce emissions, permitting stationary
7 sources and enforcing the regulations on the stationary
8 sources. Just an overview on the San Joaquin Valley Air
9 Quality, I call this slide the good, the bad and the
10 ugly. Air quality is improving. That's the good part.
11 We've obtained the PM10 standard; we did that a few
12 years ago. We're seeing steady air zone improvements.
13 We've got the one hour ozone standards that's kind of on
14 its last legs. We're about to obtain that over the next
15 year or so. We've also had the cleanest winters on
16 record for the fine particular matter, PM2.5. We
17 attribute a lot of that to a lot of the open burning
18 that has been cleaned up as well as fireplace burning
19 that we've adopted mandatory restrictions on in 2008.

20 We live in a bowl as this map kind of shows
21 here. We've got mountains on all sides, our climate is
22 Mediterranean and both during the summer and the winter
23 we get very stagnate conditions. That's what helps keep
24 the pollution there, that's what actually helps form
25 pollution in the San Joaquin Valley. So we have this

1 predisposition, this natural predisposition to ozone
2 and particulate matter. Because of that we need about a
3 75 percent reduction in nitrogen oxide emissions in
4 order to obtain the 1997 ozone standard that was
5 propagated by EPA. A 75 percent reduction from the 2005
6 level and we are on track to meet that reduction by
7 about 2023. A 75 percent reduction in anything is huge.
8 As you can imagine, it's going to take every effort
9 possible to get those kind of NOx reductions.

10 The other—this is the ugly part of it. The
11 mobile sources contribute about 80 percent of the NOx
12 emissions. Those reductions are slow, they are coming
13 but they are slow. It takes a long time to turn over
14 the fleet that is responsible for the majority of the
15 NOx emissions and they're beyond the District's
16 authority. The Air Resources Board has done a lot over
17 the last few years with the Truck Rule. It's very
18 controversial but very effective in reducing NOx
19 emissions and PM emissions.

20 The other part of this is that stationary
21 source reductions are diminishing. We've invested—the
22 folks in the San Joaquin Valley have invested billions
23 of dollars to reduce emission from stationary sources
24 and area sources, the local businesses in the San
25 Joaquin Valley.

1 The last ugly part of this is the EPA Ambient
2 Standards, air quality standards, those health-based
3 standards are getting tighter all the time. We did see
4 the administration defer the latest proposal for our new
5 ozone standard until 2013. It's inevitable that that
6 standard is going to get tighter as well as the
7 particulate matter standard. Everything is getting more
8 difficult it seems like.

9 Our clean air strategy is kind of summed up
10 here in these seven points with a kind of a fancy title,
11 "Leave no stone unturned." We can't really reject
12 anything, any kind of option right now. We have to do
13 cost effective regulations on our businesses. We count
14 greatly on the state regulations for onroad and offroad
15 diesel engines, trucking construction and agriculture is
16 going to be part of that.

17 We are working more in incentive grants. Our
18 goal is to get \$200 million per year in incentive grants
19 to reduce emissions and that's mainly NOx emissions that
20 we're paying for. That's the precursor for both ozone
21 and particular matter and we need to reduce NOx more
22 than anything else.

23 We also have a fairly robust land use program,
24 things have changed over the last few years in
25 construction and land development but we have that

1 program there when it's going to be needed again.

2 We also have a very strong public engagement
3 program called Healthy Air Living, the tagline there is
4 make one change. We want to get the public behind the
5 clean air efforts and actually doing their part to
6 reduce emissions and support the work of the Air
7 District.

8 We also need and have a technology advancement
9 program that's going to find us new ways to help the
10 Valley out, ways that we don't know of yet over the next
11 decade or so. So we've got several million dollars
12 every year going into technology advancement.

13 We're also looking at co-benefits from the
14 state climate change activity, cap and trade when that
15 develops.

16 Talking about agriculture. Agriculture has
17 been subject to several major district initiatives over
18 the last few decades. Open burning is probably the
19 biggest one. We've been able to reduce open burning
20 emissions by 80 percent since we started tracking
21 records. I think it's actually more than that. The
22 days are gone when you can see these columns of smoke
23 from agricultural burns in the San Joaquin Valley. You
24 don't see that anymore.

25 The agriculture industry became subject to

1 permitting in 2004 and they've had a lot of catching up
2 to do in the last seven years or so. They now have
3 regulations for confined animal facilities, dairies,
4 stationary internal combustion engines, conservation
5 management plans for fugitive desks. We also have an
6 off field fugitive desk regulation and they're also
7 subject to Title 5 federal permitting. There are state
8 regulations that they have to comply with, these are
9 just the air regulations. There's also water
10 regulations, water quality regulations, that they need
11 to comply with too.

12 But the state regulations, pesticides,
13 portable equipment, the truck rule has had an impact on
14 our growers in the Valley and the offroad equipment rule
15 in 2013 is going to have an impact as well. That's
16 going to be for tractors and harvesters and that kind of
17 equipment.

18 We've, over the last few years realizing that
19 we need a huge amount of NOx reductions that we can't
20 get through the regulatory process, we've been putting a
21 lot of effort into incentives and actually paying for
22 emission reductions. So far we've invested \$300 million
23 in public money and achieved about 82,000 tons of NOx
24 reductions. The fleet upgrades include heavy duty
25 diesel trucks, very successful program with agricultural

1 irrigation engines, converting those to cleaner diesel,
2 converting some all the way to electric pumps, offroad
3 equipment such as agricultural tractors and construction
4 equipment, locomotives is not listed here, diesel school
5 buses and gross polluting passenger vehicles. We're
6 trying to do as much as we can with incentives realizing
7 that the stationary source regulations are just not
8 available at this point.

9 The Valley Air District Incentive Program is
10 recognized as the most productive in the state for
11 turning funding into reductions. We have partnerships
12 with other districts and we're administering a couple of
13 statewide programs now for incentive programs. I've
14 already mentioned the technology advancement program.
15 That's going to help us develop specific solutions for
16 Valley situations which wouldn't happen without us, I
17 don't think.

18 Our perspective on biofuels. I guess it's
19 interesting—we've got to remember that the San Joaquin
20 Valley Air District is an Air District. Our mission is
21 focused on public health of Valley residents. The
22 greenhouse gas strategies that the state has put into
23 place, it's not our mission and we will count on those
24 co-benefits if they happen. Our mission is really
25 focused on public health and those are the acute and

1 chronic public health issues that folks face on a day-
2 to-date basis.

3 Waste-to-fuel is a big part of our landscape
4 in the San Joaquin Valley. We really count on the
5 biomass power plants. We've got about a dozen of them
6 right now burning that agricultural woody waste, the
7 woody biomass. I'll have to compare notes with you and
8 get more information on getting more energy out of
9 those—out of that wood waste because we'd like to see it
10 used more efficiently. Dairy waste is a big source of
11 volatile organic compound emissions which contribute to
12 ozone formation. And then biodiesel. We're still
13 uncertain about the biodiesel, there is a particulate
14 matter reduction and greenhouse gas benefits but from
15 what we've seen the NOx issues are not overcome yet. We
16 still see that there is a bit of a NOx increase from
17 biodiesel. Purpose grown feedstock is something that
18 we're very interested in, replacement of current crops
19 obviously and we would need to see a refining and
20 marking capacity that would come under District
21 regulations.

22 Talk about dairy cows in a minute here. We've
23 got 2 million dairy cows at the moment in the San
24 Joaquin Valley. That's about 1 cow for every 2 people
25 in the San Joaquin Valley. That generates about 200

1 million pounds per day of dairy waste, 640 tons per day
2 of methane from the lagoons. That's just from the
3 lagoons from where the liquid and solid manure go.
4 There are more emission and enteric emissions that come
5 directly out of the cow. What we see is an annual
6 potential for about 2.1 million megawatt hours. That
7 was an EPA estimate from a couple of years ago. We
8 translated that into diesel equivalent and we came up
9 with about 176 million gallons per year which was higher
10 than the estimate that you just saw but it's in the same
11 ballpark.

12 Our digester experience is based on about a
13 dozen projects to date. What we're seeing is that some
14 growers, some dairy farmers are interested in installing
15 generators. The best available control technology for
16 NOx has been kind of a sticking point for some of those
17 operators, some of those engines. They've had
18 difficulty meeting those NOx limits but, as of right
19 now, the engines and the catalysts are performing well.
20 We need those NOx reductions, we need to prevent
21 significant NOx increases in order to advance our clean
22 air strategy. That's central to all of this.

23 What we're seeing also is that the onsite
24 electrical generation from an air quality standpoint is
25 that it competes with the cleaner central power plants.

1 The central power plants are obviously cleaner. We
2 would like to see electrical generation as clean as
3 that.

4 We're looking more toward biomethane to be
5 used as vehicle fuel and for injection into the utility
6 pipelines. What we're seeing as probably the most
7 promising opportunity is multi dairy gas gathering
8 system. Plus a central plant that conditions and
9 generates electricity or injects it to a pipeline there
10 but a multi dairy gathering system appears to be the
11 most economical. There have been some attempts at that
12 sort of business model. I'd like to see more of that.

13 What we're seeing also is that those can
14 produce excess energy, more energy than can be used
15 onsite. As we're seeing, projects need startup
16 assistance and they need some utility rate structure
17 adjustments for the feed-in tariffs.

18 That's pretty much the conclusion of my
19 presentation. If you have any questions, I'd be happy
20 to talk a little bit. We're busy. Thanks.

21 COMMISSIONER BOYD: Before we open up for any
22 comments from the audience on this one topic, with the
23 consent of the Secretary, I know a gentlemen from the
24 Air Resources Board is in the audience, Mike Waugh, and
25 we work with him a lot and he has indicated a

1 willingness to say a few words about the low-carbon
2 fuel standard. And, since it's been referenced here
3 several times and since some of us see it as a large
4 driver as new opportunity in this arena, I thought Mike
5 might want to say a few words to add to our knowledge
6 base here.

7 MR. WAUGH: Thank you, Commissioner Boyd.
8 Good morning, Secretary Ross. I am Mike Waugh. I am
9 Chief of the Transportation Fuels Branch at the Air
10 Resources Board.

11 First of all, I'd like to thank the panel.
12 They did a lot of the heavy lifting for me this morning.
13 Allan and Jim especially talked about the low-carbon
14 fuel standards so I think a lot of people are familiar
15 with it.

16 There are a couple of things that I want to
17 bring up. One really gets to one of your issues,
18 Commissioner Boyd, and that is the monetization of some
19 of these lower CI fuels.

20 As you know, the low-carbon fuel standard
21 drives the fuels to a lower carbon intensity which
22 really means waste products. You can see from Jim's
23 graph that the biogas and some of the waste derived
24 fuels have the lowest CI and that is really what the
25 LCFS drives.

1 So the lower the CI the better and I like to
2 think the better has more value in the marketplace. The
3 LCFS is a performance based program. It doesn't tell
4 you which fuels to use but if you use electricity or
5 hydrogen or lower CI biofuel, you're going to be
6 successful in the program.

7 One of the things about the low-carbon fuel
8 standard is that it's backloaded in that the first years
9 are pretty modest requirements, for example Jim
10 mentioned that this is the first implementation here for
11 the LCFS and there's a .25 percent CI reduction target
12 for this year, it goes to .5 percent next year and 1
13 percent after that. Toward the end of the decade, that
14 curve really starts to dip and we think that the low-
15 carbon fuel standard is going to present more of a
16 challenge doing those years.

17 We have seen in the first and second quarters
18 of this year that people have overcomplied with the LCFS
19 and have generated credits. And this is an important
20 market when you generate credits and when you overcomply
21 with the curve. We think these credits are going to
22 come in handy later on and will be necessary later on to
23 meet the low-carbon fuel standard. As such, I think
24 that's where the value of the lower carbon intensity
25 fuels is going to come. It will be recognized so that

1 people will be paid for the lower CI fuels, the waste
2 derived fuels.

3 A couple of things we're taking to our board
4 as proposed revisions. One is that we're going to be
5 more clear on our credit market, how it works, so that
6 these credits can be traded more easily. Again, I think
7 we're going to end up publishing some average credit
8 prices and this will be a market signal and when you see
9 that market signal, credit prices perhaps rise as the
10 LCFS becomes a little bit more challenging in the later
11 years, that's going to be the market signal that people
12 are going to realize that, "I'm going to get paid for my
13 lower CI fuels."

14 The other proposed revision we're taking to
15 the Board in December is an enhanced regulatory party.
16 There's some discussion about, again, not realizing some
17 of the lower CI fuels in the marketplace. The way that
18 the program works now, the regulated party is the party
19 that puts the fuel into the marketplace and so if you're
20 a biofuel producer, chances are you've sold your fuel to
21 somebody else, say an oil company, and passed along the
22 obligation for that. At the end of the day, the fuel
23 producer is not the regulated party, it would be the oil
24 company or whoever puts it into the market.

25 We're proposing to revise for the LCFS is that

1 if, in fact, for example you have a biofuel producer
2 that's producing an 80 CI ethanol and the buyer says I
3 don't need 80 for this, I'm only willing to pay for 90
4 or you don't rebrand it, what would happen is that with
5 this proposal, if the Board approves it, the biofuel
6 producer can pass some of the obligation along and keep
7 some of the obligation which that cannot due now and by
8 doing so they would generate credits themselves. And
9 they can say, "If I don't get value in the marketplace,
10 I'll give you what you're willing to pay. I'm going to
11 generate credits and hold credits now because,
12 currently, only regulated parties can generate credits."
13 So fuel producers would say, "I volunteer to be a
14 regulated party because I want to generate credits
15 because I want to generate credits because I'm going to
16 get the value from my products." So that's another
17 proposal that we're going to take to our Board.

18 In closing, again really, I thank the panel
19 for their discussion on the low-carbon fuel standard but
20 I want to get right to the point that we think the value
21 is going to be there in the low-carbon fuel standard
22 when it gets more challenging, when the credit signal is
23 out there and then also people can generate the credits
24 and get value for their product through this enhanced
25 regulated party.

1 One other comment regarding biodiesel and NOx
2 that Scott mentioned. We have a separate regulatory
3 process underway to look at mitigating NOx from
4 biodiesel and that's being—that's a separate regulatory
5 work that's being done for renewable diesel and
6 biodiesel, looking at B5 and B6-B20 at some point.
7 We're looking to address that so more biodiesel can
8 enter into the marketplace.

9 COMMISSIONER BOYD: Thanks, Mike. Thanks very
10 much. I have no questions. If anyone has a question or
11 comment that they'd like to make about what's been
12 stated in this forum so far, now's the time.

13 UNKNOWN SPEAKER 1: Well, yeah, I was wondering
14 with the lower carbon intensity, if there isn't some
15 manner in which various agencies in the state can start
16 cooperating like air quality to allow for some of the
17 inherent mitigation that's in biofuels to give it some
18 kind of grace with regard to permitting processes.

19 MR. NESTER: I think that's a really good
20 point. I think we would, right now we're probably not
21 set up to—for that sort of exemption or waiver or
22 something. That would probably need to come through the
23 legislature in order to give some kind of variance for
24 low-carbon fuels. If they meet all the standards, if
25 the—if the processing plant could meet all the standards

1 then there's not an issue. Did that get to your
2 question?

3 UNKNOWN SPEAKER 1: I was just curious about
4 the issue of permitting plans that are going to be
5 developed by biodiesel fuels and whether there would be
6 reduction downstream for example.

7 MR. NESTER: Right.

8 UNKNOWN SPEAKER 1: But considering that
9 reduction downstream that you're going to, in essence,
10 recognize the benefit of that process and ease or
11 facilitate the permitting that's going to be required to
12 enable those processes to come online sooner. So, like,
13 development of homeland economy, kind of, consolidation
14 of the various departments that have influence over the
15 eventual permitting of facilities.

16 MR. NESTER: Kind of like a holistic approach
17 to the problem?

18 UNKNOWN SPEAKER 1: Yes.

19 MR. NESTER: I think it's—those kinds of
20 solutions are important, I would think, right now like I
21 said it would probably need some kind of legislative
22 adjustment for that.

23 MR. MORRISON: One issue I think there is with
24 permitting is a lot of the permitting is done on local
25 level and state agencies don't have as much jurisdiction

1 over those as much. For example, water issues are the
2 local water board and not a state agency. The same with
3 the local air board. We, within the state, we've
4 actually discussed this within a group I participate in.
5 What the state can do to help permitting. Again, we
6 don't have the—we're not the ones to sign off on those
7 permits. We can try to help by directing you to which
8 agencies they are, kind of bringing you together and
9 acting as a forum. Underneath the CalEPA, they are
10 trying to put together that type of program. But,
11 again, you have to remember that the state isn't the one
12 who signs off on it. We have to be very careful of our
13 jurisdictional responsibilities with the county and
14 local agencies.

15 VAN RAINEY: [INAUDIBLE]

16 MR. MORRISON: Excuse me?

17 VAN RAINEY: [INAUDIBLE]

18 MR. MORRISON: Yes. Well, hopefully, CDEA and
19 Measurement Standards is not but I think everybody
20 within the agencies is aware of this and is—all the
21 people are acutely aware of it and aware of the need to
22 get facilities online to get to the right person and I
23 think they'll try to help you.

24 MR. MAYUGA: Yes. My name is Mark Mayuga.

25 Madame Secretary, Chairman Boyd. I represent a company

1 here in Sacramento, actually its base, and the name of
2 the company is Calmetha. Calmetha is a partnership of
3 Bechtel USA and Siemens Germany. We are in the process
4 of developing a biofuels project in California using
5 biowaste, everything from dairy waste to forest
6 reduction waste. Specifically we're focusing in on rice
7 straw right now. I understand that's the big bad boy in
8 the state. The Siemens process has been in existence
9 for over eight years in Europe, actually longer. We are
10 in a process which can take virtually any type of
11 biowaste. Actually, I was very excited to hear, was it
12 200 million pounds of dairy waste is very exciting stuff
13 to me.

14 [LAUGHTER]

15 You know. That's a lot of tonnage. My plant
16 or the plant we're developing requires roughly a half a
17 million tons of biowaste. What's interesting about our
18 process is that we are privately funded. There are no
19 government requirements; there are no tax incentives, no
20 grants, no anything. Totally privately funded to the
21 extent that we can build at least five of these plants
22 in California. Each plant is worth roughly \$850 million
23 to \$1.2 billion. This is a real project. I've been
24 working with Glenda, Mr. Houston and some of the folks
25 at CEC and this is real stuff folks. I heard a lot of,

1 "Gee, I wish we had this and I wish we had that." This
2 plant will produce 70-90 million gallons of methanol.
3 We actually have contracts, letters of intent on
4 contracts for the sale of that methanol already. We
5 have that much demand worldwide.

6 We are also in discussion with the Department
7 of the Navy regarding biodiesel and our methanol out of
8 Hawaii. So this is kind of an innovative project but
9 it's kind of old hat for Siemens. I think you know them
10 by reputation. Our biggest challenge though,
11 truthfully, is acquiring and securing sustainable
12 feedstock, believe it or not. It seems that the owners
13 of the feedstock may consider it garbage or whatever but
14 when it comes to dumping it or whatever they want to get
15 paid a very premium. It's been a challenge for us.
16 Specifically with the rice growers. We're getting
17 around that to some degree. At the end of the day, when
18 you produce 70 or 90 gallons of methanol for sale,
19 liquid methanol, this is not methane but liquid methanol
20 and it is the new fuel in Europe and in Asia, not to
21 mention the fact that it is the basis for a lot of
22 plastics, glycol, things like that. This is an
23 interesting project and the only thing I'm asking if
24 there's anybody here in the audience to give me your
25 biowaste. And you dairymen out there, I could use

1 everything you've got. We can take olive pits, almond
2 shells but anyway I just wanted to interject this into
3 the meeting now because there's a lot of what this plant
4 will do, this project will do, I think it will answer a
5 number of questions or at least answer some challenges
6 and opportunities.

7 Siemens is serious about this. They have the
8 money to invest. I think you know they have a huge
9 reputation worldwide. We are prepared to entertain any
10 offers of waste, biowaste, especially that woody stuff
11 out of the forest. Anyway, thanks for your time.

12 COMMISSIONER BOYD: Can I ask you a quick
13 question about methanol as a transportation fuel? You
14 said it's being used as transportation fuel. In what
15 form or?

16 MR. MAYUGA: It's being used as a fuel
17 amendment, primarily. In China we've found that they're
18 using as much as 30 percent methanol in their diesel.
19 They're using it quite a bit in Europe as an amendment
20 to clean up the fuel. Of course, there's also the huge
21 demand of plastic so that's the other thing. They want
22 a billion gallons, basically.

23 COMMISSIONER BOYD: I was wondering about if
24 biochemicals aren't the real big draw. We've had a lot
25 of experience in the state with methanol, our first big

1 alternative fuels-

2 MR. MAYUGA: Yeah.

3 COMMISSIONER BOYD: Effort years ago was
4 methanol and, frankly, it was the lever that forced the
5 oil industry to clean up gasoline and diesel fuel, the
6 threat of it. But it's also more highly corrosive than
7 ethanol and, to me, it seemed to drift away as a viable
8 transportation fuel so I was kind of curious to hear you
9 say that some people are considering it for
10 transportation.

11 MR. MAYUGA: Biomethanol, bio-based methanol,
12 apparently is not as corrosive as the petroleum based
13 methanol. We have four plants right now in the United
14 States that are using natural gas, could drive methanol
15 and it's nasty. The bio apparently in Europe,
16 apparently, they figured out a way—the right formulation
17 and they're using it in their diesel cars. Almost half
18 the sale of automobiles are diesel cars rather than
19 gasoline.

20 COMMISSIONER BOYD: Well that's a tax policy
21 artifact.

22 MR. MAYUGA: Yeah, maybe.

23 MR. RAINEY: Can the state or the USDA comment
24 on or can or are they doing anything to aggregate
25 resources of waste streams, be it from farms, forests,

1 whatever. Are there any programs underway that would
2 enable the aggregation and delivery of waste streams?

3 DR. HUMISTON: Yeah. We have a regional
4 industry cluster in the Northern Sierras right now
5 looking at creating a template for exactly that.
6 Amongst the three projects they have underway, one of
7 the major one is transportation exchange. What they
8 found up there is of the 20 some plants, they often have
9 a trucker hauling material 16 miles to Plant B while at
10 the same time the trucker next to it is hauling material
11 70 miles back to Plant A and it's just ridiculously
12 inefficient. So they're working with our program and
13 several other partners to create a transportation
14 exchange to actually do exactly that.

15 We're going to be utilizing that as a template
16 that for other parts of the state and other sources of
17 biomass.

18 SECRETARY ROSS: Thank you.

19 COMMISSIONER BOYD: I guess we can proceed
20 with the next group of folks.

21 MR. RILLERA: I'd like to invite the
22 Agricultural Business Panel up.

23 MR. JENNER: Are we ready to begin? I'm Mark
24 Jenner and I'm an economist at the California Biomass
25 Collaborative. I'm an immigrant from the Midwest and

1 actually I spent about 10 years working for the
2 American Farm Bureau Federation so I have a passion for
3 biomass and what it can do. In fact, I recently began
4 referring to biomass as carbon that serves a purpose.
5 We get caught up in the climate change and carbon
6 policies and those are focused on dealing with leakage
7 from the system, not in dealing with what we can do with
8 it. So that's my little personal promo.

9 I'm a part of a great team. Steven Kaffka is
10 our Director of the Collaborative, Rob Williams is an
11 Engineer that's been involved with the Collaborative
12 since its inception and Jimin Zhang is doing the
13 research, the crop research, on the biofuels and
14 bioenergy crops for Steve and then I'm kind of filling
15 in the gaps.

16 Okay. We were asked to cover a lot of ground
17 and all of these topics are important: an overview of
18 the biofuel feedstocks, biofuel co-products, water use,
19 purpose grown crop locations, ag waste chain feedstocks,
20 some of the relationships between the national ag's
21 policy for biofuels, strategy of achieving these
22 policies and current status of the purpose grown
23 materials in ag residues. Each one of these things
24 could be a session or a workshop. So I'm going to skim
25 across the surface pretty fact. I'm hoping that these

1 will be available later. We can come back, as time
2 permits, in the coming days and address these more
3 carefully.

4 I've got to start with a qualifier, since
5 we're talking—the reason I was brought to California was
6 to look at the economics of purpose grown crops. So
7 I've done a lot of thinking on this and I want to set
8 these three kind of qualifying factors in play. It goes
9 against some of the things I've done in the past but
10 purpose grown crops are a commodity. They have a
11 different economic structure from when you're dealing
12 with a residue for instance. The demand is directly
13 associated with the production of that commodity. When
14 you're dealing with a residue, you're dealing with a
15 byproduct. The amount that's produced—when you produce
16 a certain amount, the amount is processed and utilized.
17 It may be completely different than the demand for the
18 commodity of the crops that's produced. Those residues
19 tend to be pretty homogenous and alike in character.

20 So they kind of come in and out of the
21 economic system as the demand requires. The waste then
22 are things that are a combination of things and they're
23 leftovers like manure—I'm a manure guy academically
24 speaking. Manure. My definition of manure is leftover
25 corn and soy beans, you know, it's really not bad stuff.

1 But the wastes are problems and when there's excess
2 supply of materials that overload the demand that
3 requires additional costs to remediate. So there's
4 three different economic structures in play when we talk
5 about ag biomass.

6 Overview really of the distribution of
7 California biomass is regionally defined. Forestland is
8 rain fed and typically on steep slopes. Agriculture in
9 the large areas is irrigated and largely flat. Solid
10 waste is concentrated around the urban areas and
11 wastewater can either be in the urban areas where the
12 people are or in the rural areas where the food
13 processing facilities are. Not all biomass is
14 uncommitted. There's about 5 million metric tons of
15 residues used in power generation currently in California
16 that wouldn't be available for liquid fuel or wouldn't
17 be directly available. It could be moved out of the
18 power industry but it's already committed.

19 Food processing residues are often fed. It's
20 an amazing integration of systems. If the cattle
21 industry wasn't able to take the food processing
22 residues that they are and turn them into economic value
23 then they'd have to be hauled and land applied at an
24 additional cost.

25 And now we bury somewhere along the lines of

1 20 million metric tons of biogenic materials in
2 landfills that's already kind of committed. If you
3 think it's easily available, talk to the compost
4 industry who would like to have access to them. They
5 also have committed biomass materials.

6 So this is a great map, the green is where the
7 forest residues are, the orange is where the ag areas
8 are and you can look at San Francisco, Sacramento and
9 Los Angeles and you can see the cluster of landfill and
10 municipal solid waste and the grease concentrations.

11 This is the traditional, this has been around
12 for awhile, the assessment of what's available
13 technically and total universe of biomass is the
14 combination of the purple and the green. The technical
15 available is what can be physically removed but this has
16 no economic component to it. So what's actually
17 available economically is probably a great deal smaller
18 than either of these categories. There's about 33
19 million metrics tons in the purple and about 83 million
20 in the green.

21 So this is what I was going to rush through a
22 little bit. I didn't put this busy slide up here,
23 series of slides, to confuse you but you basically have
24 feedstocks and it gets converted into technology and you
25 get some byproducts and some outputs and yield out of

1 it. This is a great collection that Rob Williams put
2 together. These first two you can see are ag crops, the
3 grains, the starches and the sugar crops, sugar beets
4 and sugar cane and then the oil seeds as well as the
5 pathways that they take.

6 This is where the municipal wastes come in and
7 they're available for anaerobic digestions, some of the
8 ag wastes are available also. They produce methane.
9 This is where the lignocellulosic crops come in and this
10 is specifically for cellulosic ethanol production but
11 they can be produced in these other categories and then
12 you get some conventional technologies that can take
13 advantage of some of the biofuel things.

14 The point of me putting in this series is that
15 this is really complicated. If you are overwhelmed,
16 welcome to the club. It's a very complicated series of
17 processes that we're asked to attach economics to and
18 fit into the policy environment. It's happening and we
19 know more today than we knew not very long ago. It's
20 great that it's still a work in progress.

21 I came to California from the Midwest and it's
22 been an eye-opener for me. I've worked in agriculture
23 for 30 years and I'd always heard about California as
24 this mystical land out on the West Coast. I got out
25 here and it was amazing. I couldn't believe how

1 productive California is. I've had that with me as
2 I've begun working here. It doesn't really fit the ag
3 models that are being used to evaluate what's possible
4 in the U.S. and California is a major player of that
5 production but it falls between the cracks of the
6 models.

7 So I developed with Steve Kaffka this local
8 model to evaluate available purpose grown crops in
9 California and it worked pretty well. I'll talk about
10 that in just a bit. To try to get to some talking
11 points about what's available in California, I
12 recategorized the value of ag production in the sense of
13 agriculture for the top 5 producing states, which are
14 California, Texas, Iowa, Nebraska and Illinois.

15 The first column is what California does and
16 the second column there in the box is the average of the
17 next four states. The last column is how many times
18 more productive California is than the rest of the top
19 four or five producing states. The (indiscernible) of
20 doesn't produce food for humans. You know, we talk
21 about food versus fuel. California is producing food.
22 They produce 80 times more than the average of the next
23 top four producing states. That is according to Mark
24 Jenner's classification of categorization.

25 The rest of the debate, the rest of the

1 country is talking about feed and animals, food
2 products and other fiber crops and then California is
3 also producing almost 10 times more ornamentals and
4 other products. The thing is of what's important about
5 this is that these high value crops are not going to be
6 replaced with purpose grown ag products. Of what the
7 modeling showed of what I did is that the crops that
8 came out where the least profitable crops. They were
9 the local small grain, hay crops and some of the
10 marginally profitable lands. They weren't the food
11 crops that came out of the rotations. If a plant went
12 into a local place and wanted to have a supply of any of
13 these five crops this is kind of a way if they were
14 guaranteed by a production contract an additional \$20 an
15 acre profit by anyone of these crops individually.

16 Those regions are how—I did each of these runs
17 independently so you have to look at a region by itself,
18 like across all the crops, you can't really compare them
19 for each crop. You can see that the central region—the
20 San Joaquin Valley—I relabeled these so that you could
21 understand the labels and I think maybe I didn't get
22 them right.

23 So the sugar beet is the Northern San Joaquin
24 Valley, the one with the high sugar beets. I used
25 regionally specifically budgets for crops and used the

1 same, pretty much, the same prices as the energy crops
2 and this is what it showed is that for each energy crop
3 you get a different outcome.

4 Sweet sorghum—Bryan Pellens is popular down
5 there. This is all hypothetical, of course, based on
6 2007 prices which is different than today. This is
7 close to the end, I put this slide in in this
8 presentation because it stunned me.

9 What it says, this came from Brian Jenkins
10 who's the Director of the Energy Institute, and he was
11 the Director of the Biomass Collaborative. So what it
12 says is that for a dry ton of biomass you can get the
13 most bang by producing electricity in combined cycles or
14 biomass cofiring powering systems. Rob told me that
15 actually that is really hypothetical today, it's not
16 quite there. Even if you go down to the 25 percent
17 conversion of electricity because, and Rob explained
18 this to me, everything we know about the inefficiency of
19 electrical production and the efficiency of transmission
20 from once it's created is true. Also the efficiency of
21 the fuel, the energy and the fuel but what breaks down
22 is the conversion of fuel into road miles in a vehicle
23 is not efficient.

24 So anyways, this is based on a car, an
25 internal combustion car, that gets 44 miles a gallon so

1 if you took it down to a car that was getting 30 miles
2 a gallon, the internal combustion engine would even look
3 worse.

4 So just a bit about the carbon policies,
5 here's a race to assess these carbon impacts and the LCA
6 methodologies are still being developed. EPA uses the
7 one methodology and ARB uses another methodology. And
8 the purpose grown energy crops don't really have a
9 presence historically so they're not really part of the
10 current—they're all based on estimates and guesses. The
11 California low-carbon fuel standard has a unique way of
12 reducing the carbon intensity of fuels but doesn't
13 specify how they're going to get that reduction met.

14 Part of this too at the federal level, they
15 mandate not only the carbon intensity, minimum carbon
16 intensity, but also how it's going to be produced.
17 There's a limit to flexibility and these two policy
18 tools don't match. It's not clear. It looks like
19 everybody is going to have to meet both of them to
20 comply with both of them in different sets of rules.

21 I get it. It's kind of breathtaking, I guess,
22 that even at the federal level with the Department of
23 Energy and the EPA cannot agree on what biomass is and
24 what it emits, whether it's a positive or a negative.

25 So really I think that this is the last slide

1 I have. Prospects for ag feedstocks and for biofuels
2 in California will be dependent on where they are
3 developed because different regions of the state have
4 different resources that they depend on for agricultural
5 purposes whether it's grown as a commodity or as a
6 leftover.

7 The cost and efficiency of the conversion of
8 the technology and also the abundance of the feedstock,
9 stability in biomass and the carbon policies is
10 nonexistent right now. That's a big problem. I mean we
11 go back to the air board issues with the digesters,
12 that's a Clean Air Act issue. That's not a greenhouse
13 gas issues. We come through these policies in waves
14 and, with manure we went through a lot of quality
15 process and then we went through an air quality process
16 and now we're going through greenhouse gas process. We
17 haven't even gotten to the greenhouse gas regulations.
18 The barriers for digestive production, you know, even
19 though they're legal. I'm not wanting to add to that
20 debate. Those regulations are based on air quality not
21 greenhouse gases.

22 There are many investment risks and
23 environmental concerns and they want to be met. Biomass
24 has lots of good stuff. It can be produced into
25 anything that we're using carbon based products for now.

1 If you look at the plastics, the wood, the paper, the
2 food, even I throw in recreation because it's really
3 great that we have these national parks with the
4 sequoias and Yosemite that are really important when we
5 talk about biomass production, that's really what is a
6 lot of that value.

7 Just a lot of challenges but if we build on
8 the fact that biomass has known benefits, we can
9 mitigate a lot of these and lower the cost of
10 investment. That's my pitch. Any questions?

11 MR. KING: Good morning, everyone. I'm Jack
12 King with the California Farm Bureau. It's a pleasure
13 to be here and I commend you on your discussions.

14 It's a big issue with California farmers and
15 ranchers. We are energy consumers. We're potentially
16 energy providers. We are also in that kind of crossfire
17 of having to deal with environmental issues whether it's
18 disposing of waste, dealing with air quality so this
19 issue is quite pertinent.

20 I've left in the back and I arrived late so
21 not many had a chance to see this. This talks a little
22 bit about our role as potential energy producers and
23 consumers. I've also left just a little sketch of
24 California agriculture.

25 Mark set it up perfectly to, in his

1 indication, that California is different. We're not
2 uniquely different but we're certainly different than
3 more of the rest of the country.

4 We are a grain deficit state and certainly
5 that creates its own set of pressure points when it
6 comes to maintaining our dairy industry, our poultry
7 industry. It puts us somewhat at odds on national farm
8 policy because some of the directions on national farm
9 policy has to do with the role of our major crops, corn
10 production, soy beans. We're at that point where we
11 have that little different view of the world. There are
12 different pressure points and as a general farm
13 organization we're in a unique spot because we're trying
14 to view it from the broad perspective. Certainly Mike
15 can be very specific to the dairy industry but we have
16 grain producers, we have hay producers, we have
17 timberland, we have fruits producers, fruits and
18 vegetables, nut crops. So we have the broad
19 perspective.

20 I had the pleasure to work with Steve Shaffer
21 with the department and Neil Koehler who will be
22 speaking to you in awhile. Many years ago when we
23 approached the ethanol biomass from the problem solving
24 standpoint, at the point there was a lot of concern with
25 our rice straw, what to do with rice straw after the

1 prohibition on open air burning, for the most the great
2 limitation of it. So that needed to be solved.

3 We have current problems that need to be
4 solved. What to do with orchard prunings. What to do
5 to protect our state from wildfires in our forests and
6 neighboring private timberlands. So those are all
7 concerns of ours.

8 But again California farms and ranchers are
9 very different. We have some 9 million irrigated acres
10 in California. We grow some 600,000 acres of corn, much
11 of that for silage and forage. This compares with 92
12 million acres of corn grown across the United States.
13 Corn farmers who grow corn, they grow soy beans, they
14 grow—they have swine production, beef production and
15 dairy production. So there's a symbiotic relationship
16 between agriculture, how you produce, where the money
17 comes from.

18 I doubt that in California—I think our
19 emphasis will be on problem solving, what to do with
20 waste streams. There's no question that with improved
21 technologies we will find new crops that we can grow in
22 California, new biomass cellulosic crops. I doubt if
23 we'll ever be major ethanol producers from grain just
24 because of the infrastructure in California, quite
25 unlike from the Midwest and the rest of the country.

1 So we'll be looking at problem solving
2 solutions, we'll be looking at ways of how do you deal
3 with the prunings that you have. How do you turn that
4 waste stream into biomass? And, as the gentleman
5 indicated talking about Siemens'' efforts, we need a
6 coordinated effort. Certainly a lot has been done to
7 look at the way to improve biomass to fuel production
8 but we also need to spend a lot of time on ad
9 coordination effort, the logistics of it and some of the
10 particle problems. For example, with the pending
11 complete ban on burning on waste, pruning waste in the
12 San Joaquin Valley, we now shred the prunings and put
13 that bark down on the ground. That creates its own set
14 of problems. The mass of pruned shavings on the ground
15 creates its own set of problems. So we're always going
16 to be looking at practical solution. If we're going to
17 be looking at practical solutions of how can we best get
18 to that biomethane from the dairy industry, from the
19 poultry industry.

20 As an industry we'd like to be part of the
21 problem solving. We know it's not going to be easy. We
22 know we're not going to be major corn to ethanol
23 producers but we think we can be major biomass
24 producers.

25 A lot of our future will rely in science

1 research. Right now when it comes to conversion of
2 biomass to energy we know how to do it but we haven't
3 the mastered how to do it efficiently. How can you get
4 that rice straw into a final biofuels product? How do
5 you do it efficiently? How do you aggregate the dairy
6 waste? So those are some of the challenges that we face
7 and certainly the Energy Commission, the Department of
8 Agriculture—Food and Agriculture has a role in working
9 in finding those answers. I think California farmers
10 and ranchers are innovators. We will grow the crops
11 that have a marketplace. But we also have a very
12 practical approach to that. We want practical answers.
13 We want practical long term answers. As Mark Jenner
14 indicated, we're going to be food producers. As we look
15 at the energy equation, we're going to find times where
16 we're going to be in competition with energy production.
17 That's a slight battle, could be a larger battle, over
18 the siting of solar panels. Do you do that on prime ag
19 lands? Do you do that on marginal ag lands? That's an
20 issue that faces agriculture.

21 Again, I'll stop there. We want to be part of
22 the problem, we want to be part of the problem solving
23 and we have a lot at stake. I think that the strength
24 of California agriculture will continue as long as we do
25 a good job of solving the problems that we're talking

1 about today. So I thank you.

2 MR. MARSH: Good morning, Madame Secretary,
3 Vice-Chairman Boyd. Nice to see you today. Madame
4 Secretary, I have to extend you the greetings from your
5 former staff at the USDA who I met with yesterday
6 morning. They said to say, "Hello." I commend you also
7 for holding this biofuel forum.

8 The California dairy industry is a significant
9 economic engine in the State of California, generating
10 about \$64 billion dollars in annual economic activity
11 and 454,000 jobs. Of course the economic calamity of
12 2008-2010 put out dairy industry in a very difficult
13 position. Environmental regulations are also challenges
14 here in the State of California and our 1.75 million
15 cows that populate the state, they eat, they drink, they
16 milk, they moo and they poo.

17 How do we harness that opportunity from that
18 poo? That has been a challenge and that's something we
19 have been working on. Western United Dairymen is the
20 largest dairymen trade association in the Western United
21 States.

22 In 2001 we developed the Western United
23 Resource Development Corporation in order to utilize
24 funding for SB 5X monies and a grant from the California
25 Energy Commission to attempt to develop methane digester

1 projects in the State of California on California
2 dairies. Today we have about 10 of those projects that
3 are still operational. Unfortunately, the other eight
4 have either for one technical reason or another or
5 simply the lack of available resources to continue to
6 pay for the maintenance and facilitation of that power
7 generation have unfortunately ceased operation at this
8 time. Of course they're anxious to get back on the grid
9 and generate power again but we have to find a better
10 economic model for that to occur.

11 At the same time we've been able to leverage
12 one of those projects for a U.S. EPA grant where we were
13 able to convert milk trucks to run on methane produced
14 on the farm. The farmer today is actually taking his
15 milk that he's producing on his dairy and using these
16 trucks that we were able to convert to run on the
17 methane that was produced on the farm and truck his milk
18 everyday to Hilmar Cheese in Hilmar, California from
19 Tulare County. It's phenomenal the change in the
20 emissions from those trucks when you look at taking a
21 diesel truck and have it run on biomethane.

22 Now, of course, the scrubbing equipment that
23 the dairy producer put in place was—came from a grant
24 and a significant amount of the funding for the digester
25 itself came from a grant. The balance of the power that

1 he's generating from his methane digester today runs
2 his cheese plant and also his dairy parlors on his farm.

3 While regulatory challenges are—well, they're
4 more than a few here in the State of California when it
5 comes to water quality and air quality. And, of course,
6 for one of these renewable energy projects in California
7 it simply adds up to additional cost whether or not
8 you're utilizing best available control technology to
9 mitigate NOx emissions coming from the engines or
10 whether it's perhaps to ensure that we are being as
11 protective as we can of water quality. The grant monies
12 have been very helpful to the California dairy industry.

13 Ed Burton, our State Conservationist, from the
14 USDA and his great time, Ms. Humiston and her team,
15 have been super in helping us try to find innovative
16 uses for some of those funds that have been available.
17 Of course we know that funding stream has been under
18 tremendous stress. Having just come back trying to
19 lobby for Conservation Title, Dairy Title, Nutrition
20 Title with the federal government, we know that we're
21 just kind of anticipating what kind of haircut we're
22 going to take next after the Super Committee with
23 federal program cuts.

24 And Mr. Lucas, the Chairman of the Ag
25 Committee, about a year ago or a year-and-a-half ago in

1 a hearing in Fresno actually said that California
2 should be challenged with regard to utilization of EQIP
3 funds but his suggestion was instead that we reduce some
4 of the regulatory burden that we have on agriculture in
5 the state.

6 Recently a problematic EIR, an Environmental
7 Impact Report, was completed between the Water Board and
8 the Air Board. Of course for a dairy farmer that might
9 be looking at trying to implement digester technology on
10 their farm, this problematic EIR will result in
11 additional cost for the farmer. That's what you really
12 have to have. How do you make these things pay off for
13 the farmer so it's simply not another cost of doing
14 business within the state of California.

15 And in Air Quality, producers are working very
16 diligently on dairy measure and Mr. Sidreen and his
17 staff at the Air Quality District have been very helpful
18 in trying to work with dairy producers in helping us to
19 meet our air quality requirements.

20 Here we go. Show me the money. Where is the
21 money going to come from? We're looking at \$2-4 million
22 for each installation for these digester projects in the
23 state today. As I mentioned, now today, following the
24 problematic EIR we have additional new cost for water
25 and air quality regulations. Of course at the same for

1 the dairy farmer who may want to implement this type of
2 technology, there are few federal and states monies
3 available to cost share. Now if I had a dairy farmer
4 today that had an additional \$2-4 million available to
5 implement this technology, instead he'd probably be
6 trying to pay off his bank from what he lost in 2008-
7 2010. As we saw about 20 percent of the dairy farmers
8 in the state collapse and legacy operations have been in
9 place since California became a state actually
10 disappeared from the landscape.

11 They have to pay for themselves. Dairies have
12 to be competitive and they have to be competitive in the
13 state with our colleagues outside the state as well.

14 Feed-in tariff that should be developed and
15 will help and provide incentive for this; at the same
16 time allowing dairy farmers to aggregate meters. The
17 meters on their operations would help their projects
18 become more cost competitive as well.

19 And then, of course, from the dairy
20 perspective ethanol subsidies have been a challenge for
21 us, both as the small state subsidy and, of course, the
22 federal subsidies with the blenders credits and the
23 tariffs. I think the Congress sent a very clear message
24 to the ethanol industry in the United States when
25 Senator Feinstein and her colleagues voted 73-27 this

1 past summer to terminate those subsidies and now those
2 are, of course, set to expire as well as the tariffs,
3 set to expire on 12-31 of this year.

4 I do hear from time to time comments from the
5 renewable fuels folks that DPG's can be fed to cattle
6 and that's true. We do utilize them in our feed ration
7 but they're not the same because you're taking the
8 energy from the product in order to produce the ethanol
9 which is going to fuel our vehicles; and, of course, the
10 product that you end up with for your cattle doesn't
11 work quite the same to provide the energy for the dairy
12 cattle that you might want because, as I mentioned, the
13 energy has been removed. Of course you have to wonder
14 whether the subsidy itself has had an impact on the
15 development on cellulosic ethanol and, in fact, perhaps
16 provide a disincentive for the next stage or the next
17 iteration of ethanol.

18 That concludes my comments and I'm available
19 to answer any questions that you might have.

20 COMMISSIONER BOYD: Mike, your last comment
21 about disincentives—

22 MR. MARSH: Yes.

23 COMMISSIONER BOYD: Can you elaborate on that
24 a little bit?

25 MR. MARSH: Sure. As long as you have—to tell

1 you the truth, perhaps we've seen this in the dairy
2 industry using—I'll attempt to analogize that to what we
3 see in the dairy industry. Historically the dairy
4 industry has had, as part of our federal dairy safety
5 net, we've had a dairy price support program and perhaps
6 because of the nature of the program itself, it has
7 provided a disincentive to a development of new products
8 for new customers in emerging markets. Because you end
9 up producing the type of product that the incentive or
10 the subsidy asked you to provide. In this case, one
11 would have to think with regard to ethanol that indeed
12 it's probably done the same thing there. That instead
13 of providing incentives for that next generation of
14 ethanol that we need in our country to meet the
15 renewable fuels standard, that instead it's probably
16 perhaps provided too much of an incentive for the corn
17 based ethanol production in the United States and too
18 little for the next generation.

19 COMMISSIONER BOYD: Any further questions?

20 Thank you, Mike.

21 MR. MARSH: Thank you.

22 MR. LONG: Good morning, Commissioner Boyd.

23 My name is Bryan Long. I'm the Vice President of
24 Procurement for Foster Poultry Farms. We're going to
25 flip flop the agenda a little bit between Michael and

1 myself.

2 Foster Poultry Farms is a family-owned and
3 operated, vertically integrated meat poultry production
4 and processing operation with a long history in
5 California. Foster Poultry Farms currently provides
6 12,500 well paying, well benefited jobs in California
7 and has severely economically depressed some. We run
8 about 17 percent unemployment in that region and we're
9 providing quite a few jobs, about 8,000, just in that
10 one area.

11 During the past two years, we've seen feed
12 cost skyrocket via the government mandates on ethanol
13 and biofuels. During that timeframes, we've seen our
14 profit margins shrink to record lows. We currently saw
15 an increase of about \$180 million in our cost during the
16 past 24 months. We are currently not making a profit.

17 A little bit about Foster Farms. It's kind of
18 a jewel right here in the valley. We're vertically
19 integrated. We have our own hatcheries. We have our
20 own feed mills. We have our own grower ranchers and we
21 have our own fleet. We do store-door delivery. It's
22 interesting that the cost pressures we're seeing are not
23 shared all the way across the board, I'll get into some
24 of that in a minute here. As a business we're here with
25 our ranchers. If you look here through the Valley, we

1 have about 200 ranches that we build from the ground
2 up. We house our own chickens there. We have our own
3 staffs that control those ranches. It's quite an
4 amazing feat, to have that in the middle of California.
5 It's fun to be here from industry just to talk about
6 this.

7 Rather than going through all of the woes
8 we've had because of the corn price skyrocketing and the
9 future price of corn aren't looking good at all. I'm
10 going to talk a little bit about what Foster Farms is
11 doing on the flip side. On the flip side, our fleet—we
12 have 4,000 units in our fleet. It's the largest fleet
13 here in the State of California and from trucks to
14 trailers to farm tractors to forklifts and we've had to
15 struggle with that as far as compliance goes. I'm
16 supposed to be at another meeting across the way at the
17 Air Resource Board and I chose to come here but we're
18 talking about the new Youley True Filters. Foster Farms
19 has put two Youley True Filters on our units earlier
20 this year just to test with RIPOS and tried to get them
21 qualified. We get involved and we're pretty active with
22 that side of the business. The challenge on this
23 though, and I've shared this with Mary Nichols too, our
24 competition—you've seen the commercials hopefully—our
25 competition is not necessarily here within the State of

1 California. Our competition is coming in from out-of-
2 state. Some of the AB 32 rules have allowed our
3 competition to take a financial advantage, strategic
4 advantage, over us because their equipment does not have
5 to become 100 percent compliant. They can run their
6 newer trucks into the state. That's a competitive edge
7 for them. We understand that and I think CARB staff
8 understand that but that's just a challenge we have.

9 A fun thing we're looking at right now, we're
10 looking at a biofuel plant. We are the second largest
11 buyer of rice hulls in the State of California. Most
12 people don't know that. But when you go into one of our
13 chicken ranches, you'll see six inches of rice hulls
14 which is 20 percent of the rice itself. You have the
15 hull on the outside and then the rice kernel itself. We
16 use six inches of rice hulls as a bedding. It's
17 fantastic. It's very good for the birds and keep them
18 very healthy.

19 We take those rice hulls, after each flock,
20 and we take them to our manure plant and we actually
21 turn that manure and the rice hulls into fertilizer and
22 it's actually a very profitable business for us. Our
23 disposable is minimal.

24 One challenge we have, and I've been working
25 on it for almost four years, is our dead fowl. Every

1 chicken ranch will have about a two percent loss of
2 birds during the six-eight week period the birds grow.
3 Well today we take those birds to rendering and that
4 costs us close to \$2 million a year. We have been
5 working for about three to four years now on a project
6 to take those birds to a digester, clean up that gas and
7 then use that in our production facilities either as
8 electricity or as steam.

9 I've been to the UC Davis facility and seen
10 that operation and worked with those folks. The
11 challenge we have, and not to knock the gentlemen from
12 Siemens, but I get a call every week from somebody in
13 this industry and really the challenge is these guys
14 last 18 months and they're done. I think we're pretty
15 close. We have a feasibility meeting tomorrow morning.
16 We're going to be talking about next steps on our
17 project. We're really excited about it. We're very
18 proud of the fact that we have almost no waste coming
19 out of our facilities. We recycle everything. It's a
20 pretty neat thing. We're pretty proud of that.

21 We should be able to generate 3 megawatts a
22 day of electricity and waste heat from this system. It's
23 not cheap and I'm going to ask Michael to help me get
24 some grant money for this facility in the near future.

25 Touch on the business a little bit. From a

1 capital standpoint, we were spending up to anywhere
2 from \$60-90 million a year in capital improvements. We
3 have a buy California strategy. We went away from our
4 steel trusses, we have 60 foot wide chicken ranches, we
5 were buying steel trusses out of Texas. Well we
6 invested capital in a company in Turlock and now they
7 build our steel trusses here for us locally. It's
8 worked out very well for both them and us. Whereas we
9 can get the deliveries in a much more efficient manner
10 and when they need to modify certain things, they can
11 come out and do it much easier.

12 Really, I just wanted to touch those base
13 those things. I work for a great company. We can
14 complain, moan and groan about corn. It's just really
15 hurting us. Again, we're not making money. At the same
16 time of this conference, I think there are some great
17 things coming along with biofuels and we want to be a
18 part of that. I'm going to turn it over to Michael
19 Boccadoro.

20 SECRETARY ROSS: Thanks, Bryan.

21 MR. BOCCADORO: Good morning, Secretary Ross
22 and Commissioner Boyd. Michael Boccadoro on behalf of
23 the California Poultry Federation and today I'm going to
24 try and focus on some of the broader policy
25 recommendations we have going forward. We are very

1 appreciate of the two of you in particular have put in,
2 not just with this hearing today but with some of the
3 informal activities. I think it's really crucial that
4 we're getting all the various agencies involved in the
5 discussions because with the California and the work
6 that has been done has been done by Commissioner Boyd
7 having a biofuels strategy but we really need to get a
8 long-term vision for the biomethane, biofuel, biogas
9 industry in California and establish some goals and then
10 get the funding and the programs in place. Whether it's
11 energy purchase programs. Whether it's Public Goods
12 Charge funding for biomass and biogas. I don't think it
13 should be lost on anybody that we had \$90 million in
14 that bill that died over the next four years for
15 agricultural biogas and biomass that would have been a
16 huge jumpstart to this industry. We need to continue to
17 find a way to get that whether it's through legislation
18 or whether it's through the Public Utilities Commission.
19 That's critically important because we need that front
20 end capital infusion.

21 On the backend, we need policies coming out of
22 the Public Utilities Commission. We're at a point where
23 I feel very positive for the first time in a long time
24 that we're getting the attention that biomass, biogas,
25 biomethane deserves today and getting some programs in

1 place that can help it.

2 Let me just ask from a recommendations going
3 forward, we're not opposed to ethanol. You heard a lot
4 of concern from the dairy industry and the poultry
5 industry and I'm sure you'll hear some from the cattle
6 industry in a moment. Corn prices are killing us. I
7 like to say here in California we like our ethanol aged
8 in oak and cask not in fuel tanks. It's a challenge
9 going forward and so one of the concerns we have as we
10 move forward is that we have policies that compliment
11 California agriculture and not counterproductive. One
12 of the ones that we were concerned about which was
13 counterproduction was the CEPIP program and the
14 additional incentives that were being provided by the
15 Energy Commission through that program to corn based
16 ethanol here in California.

17 Corn ethanol has a trifecta of subsidies going
18 forward with the renewable fuel standard, the mandate,
19 the blenders credit that Mike Marsh touched upon and the
20 tariff preventing out of country ethanol coming into
21 California. They've got a trifecta. Adding an
22 additional subsidy to corn ethanol in California is
23 probably counterproductive given that it's competing
24 clearly with our industries. That's a very real
25 reality. Just this week it got announced that Fulton

1 Valley Farms, a longtime California chicken processing
2 operation, organic free range, announced that its
3 closing its doors at the end of the year. They
4 announced that just this week. They're a large, mid-
5 size central coast and central valley producer. With
6 that loss we're going to have 185 fewer jobs here in
7 California at the first of the year.

8 The impact of corn prices and feed costs on
9 the poultry industry in California are very real.
10 They're one of the smaller producers. They don't have
11 some of the advantages that you just heard from Foster
12 Farms in terms of being vertically integrated. They
13 don't own their own feed mills. So their costs are
14 going to be a bit higher. It's a real impact that we
15 can't lose sight of. As we move forward, we're very
16 pleased to hear that the Energy Commission is not
17 planning to further fund the CEPIP program here in
18 California and move away from further subsidy of corn
19 based ethanol and we strongly encourage that.

20 As we move forward, research into other types
21 of biofuels is critical whether it's dairy based as Mr.
22 Marsh commented on, we think that there's some real
23 positive benefits there. Cellulosic ethanol we can be
24 very supportive of that development moving forward.
25 We've got to find ways that compliment California ag and

1 don't work counterproductively. I can't keep saying
2 that point enough.

3 The point I made to Commissioner Boyd and
4 Commissioner Peterman earlier this week as part of their
5 biomethane workshop that they held at the Energy
6 Commission, it's real important as we move forward too,
7 we've got a lot of laws on the books now here in
8 California from an environmental perspective. Two big
9 ones, two aggressive ones. AB 32 and the RPS standard
10 in California. It's really important that as we move
11 forward with these programs that we coordinate some of
12 these activities more closely so that we're achieving
13 multiple goals with the programs that we create. The
14 biomethane workshop had one person describe it to me as
15 a little bit of a pep rally for out-of-state biomethane
16 producers. Because most of the biomethane that's being
17 purchased by utilities here in California are coming in
18 from out-of-state and we need to find ways to get the
19 biomethane industry here in California competitive and
20 functional so that we can be providing tremendous
21 resources to the utilities. They clearly want them.

22 There was a lot of not just the investor owned
23 utilities but the municipal owned utilities at that
24 hearing. The most important piece to remember is that
25 with these two hugely aggressive environmental programs,

1 they've come with the promise of California jobs, green
2 jobs. This Governor has made a tremendous point about
3 that.

4 If we're merely encouraging industries in
5 other states and not here in our own state, I'm not sure
6 we're accomplishing what the ratepayers who are paying
7 for these programs and what the taxpayers who are paying
8 for these programs and the businesses in California who
9 are paying for these programs are hoping to accomplish.
10 We need to make sure that we get the jobs here in
11 California and so I think it's really important that we
12 move forward in a complimentary fashion with our funding
13 for these programs going forward.

14 So with that, I'll be happy to answer any
15 specific questions that you guys may have as we move
16 forward with the panel.

17 MR. DICKSON: Thank you. My name is Doug
18 Dickson and I'm the Director of Commodities for Harris
19 Ranch and Harris Feeding Company down in Coalinga,
20 California.

21 I want to thank the CDFA and the Energy
22 Commission for inviting me to speak today. What I'm
23 going to do, I have a fairly narrow focus on the
24 biofuels industry in terms of how it relates to the
25 cattle industry. But to do that, I kind of need to give

1 you my background a little bit.

2 I'm a California native and after graduating
3 from UC Davis in 1975, I went to work for Cargill as a
4 grain buyer and started buying grain from the farmers in
5 the Central Valley on the hood of my pickup. Six years
6 as a grain merchant, 15 years in the poultry feed
7 business on the grain organization side, eight years in
8 the dairy feed business, four years in the ethanol
9 business and finally two years in the cattle feed
10 business. All here in California.

11 So I have a pretty good understanding of the
12 challenging of operating in a feed business in the
13 destination market which is what we have here in
14 California. Because of the high cost of feed which has
15 already been mentioned, we've had to be innovators are
16 here in California to survive, some really big
17 innovations - for one, the tray pack which was innovated
18 in California which helped value add to the poultry
19 market here in California. The TMR feeding on dairies.
20 It was innovative back in the last 70s to change the
21 dynamic and increase the size of dairies and the
22 efficiencies of dairies so they could survive.

23 Whenever you haul feed to the livestock
24 instead of hauling the livestock to the feed, you have
25 more cost in hauling the feed to the livestock. So

1 we've had to been really innovative in California in
2 terms of our feeding programs and just how we look at
3 the business.

4 You can see from my perceptive, my objective
5 or my perspective over the last 35 years has been how to
6 lower the cost and be more productive in feeding
7 livestock and poultry in California, specifically
8 livestock.

9 This is where I want to talk about co-products
10 and how—we've talked a lot about grain price, we've
11 talked a lot about how the DGD fits in and what else
12 fits in—I want to talk about the boots on the ground and
13 what we're actually doing.

14 I've got some numbers up here, since I'm a
15 corn guy, pretty much, you can Google how much corn is
16 consumed in California and you'll get about 20 million
17 hits and none of them are going to tell you. The
18 reason is because of how it's utilized in different
19 areas, the consumption rates, those kind of things but I
20 wanted to put this up here because I get a lot of people
21 ask me this. In terms of—at the top here, this is the
22 consumption side. Broilers are consuming 1 million tons
23 of corn in the State of California. Turkey 642,000.
24 Layers 540. The total poultry industry is consuming 2.1
25 million tons. Beef cattle are consuming 711,000 tons.

1 The dairy industry of course is the big boy, 4.9 almost
2 5 million tons. Total feed consumption in the state of
3 California is 7.8 million tons. As an importer, I think
4 we would be second behind Mexico in terms of if we were
5 an importing country.

6 We're talking about China right now maybe
7 importing 4 million tons and that's affecting world
8 price of China. You can see that we're consuming in
9 this state, in the feed side, 7.8 million. 150 million
10 gallons of ethanol right now in California is consuming
11 1.5 million tons of corn. The poultry industry as a
12 percent of total consumption is 23 percent. The dairy
13 feed industry, of course the largest, is 61. Ethanol
14 and I calculated the percent of netback on the DGD
15 replacement and I'll go through that on the next slide
16 because what we've done is tried to use the synergies
17 that we've seen in the biofuels business as well as the
18 feed business.

19 Corn price is high. I mean, it's affecting
20 everybody. The unfortunate thing is I think if we took
21 the biofuel business out of California, it's not going
22 to change the corn price. As a California feeder, I've
23 got to look at what we can do here in California.

24 Next slide is over. I wanted to look at WDG
25 and how much is produced. The three plants in

1 California are producing 1.3 million tons of wet
2 distiller's grain. The reason that it has a smaller
3 carbon footprint is that it's not dry. It comes out of
4 the back of the plant and it's about 180 degrees and
5 it's about 65 percent water in moisture, it's hot and
6 steamy oatmeal is what it looks like. Only it's a
7 yellow color.

8 That is—if you calculate that back to a dry
9 matter basis, that goes in and looking at dairy rations
10 and cattle rations, it goes into replace 565,000 tons of
11 corn consumer in California and on the dairy and cattle
12 side. Corn equivalent as a percentage of dairy
13 consumption is about 11 percent so that 560,000 tons of
14 corn equivalents from the wet distillers' grain is being
15 produced at 11 percent of the total dairy consumption.

16 Just to give you an idea, and I know it was
17 mentioned earlier, California corn production last year
18 we produced 928,000 tons of grain corn. That was only
19 180,000 acres. I put the corn silo up there just to
20 give you an idea. We actually produced—we planted 2.5
21 times more corn for silo than we did for grain. But the
22 percentage of California corn production versus use is
23 only 9.9 or basically 10 percent. When we talk about
24 being a deficit state, we're definitely a deficit state.

25 Here's another fact to put up there.

1 California consumption as a percent of total U.S.
2 production is 2.7 percent.

3 What I want to do is talk a little bit about
4 what the impact of this is. I'll use the dairy example
5 because my boss wouldn't let me talk specifically about
6 the savings of Harris Ranch and eating the co-product so
7 I'm going to use a basic general example and I need to
8 take issue with the comment about taking the energy out.
9 When they take the starch out but the other part of the
10 energy is the fat, lipid oil, corn oil, which is an
11 energy. You take the starch out but you multiply the
12 corn oil content by 3 times. Looking at that, all I
13 know is what is actually going out to dairies. I was in
14 the dairy feed business for seven or eight years and I
15 talked to a lot of dairy interests before I put this
16 together to see if my numbers were correct and they were
17 all up.

18 Total dairy cows, I got this off of NASS'
19 website yesterday, 2009, I know we've talked about 1.7-2
20 million. I think this is the number of milk cows in the
21 state of California as of 2009, about 8.2 million.

22 We produced, from the previous slide, 1.3
23 million tons of wet distillers grain. The average per
24 cow, per head, per day is 50 pounds out there right now.
25 So a dairy cow consumers 2.73 pounds at the standard

1 dairy ration. The number of cows eating wet distillers
2 grain in the state of California right now is 503,000.
3 That's 27 percent of the total dairy herd population.

4 The standard replacement is for corn in the
5 diet and I've been involved with looking at lot of least
6 cost formulas for dairy reactions. There's a little bit
7 of protein taken out, a little bit of cotton seed but it
8 primarily replaces corn in the diet.

9 Five pounds of corn is replaced by 15 pounds
10 of wet distillers grain. Let me tell you that the
11 distiller's grain is trading at—I put 80 percent up
12 there. Today it's 72 percent of corn. It replaces corn
13 in the diet and you don't see a difference in
14 production. I'm calculating a 15 cents per head per day
15 savings in a dairy cow.

16 Total savings for wet distillers on a daily
17 basis is 75,000. If you run that annually, that's \$27
18 million is being saved by cattle in California eating
19 wet distillers grain.

20 The other thing, and that's a \$54 per head
21 savings per cow, the other thing that we've noticed is
22 the co-product. We utilize more of the soluble fraction
23 which we call liquid corn and it's used to condition
24 feed. The dairies that are using it now and we use it
25 at the feed yard has enable us to increase the level of

1 straw or lower quality fiber in the diets. Right now
2 we're feeding up to 50 percent straw. We tried that
3 before and it wouldn't work. The cattle sorted the
4 straw out. But if you condition it with the wet
5 distiller's grain or the soluble, the cattle will eat
6 it.

7 We've dropped our feed costs on the hay side,
8 at the feed yard, by 30 percent by utilizing the co-
9 products.

10 Because of the high oil content in the co-
11 products that we're feeding, we've almost eliminated
12 tallow in the diet at the feed yard. What's that done
13 is we're selling tallow now. So one of the things that
14 we've looked at internally is putting a biodiesel plant
15 at the rendering facility where we're having our tallow
16 rendered instead of having the tallow running it through
17 the biodiesel facility and running it through our 110
18 trucks on the road right now. That's one of the things
19 that we're looking at. The interesting thing is that,
20 and I'm of course myopic in my view of all this because
21 I'm a corn guy and I've been trading corn for 35 years.
22 All of it in California but as a destination.

23 I see the corn coming in, Harris actually buys
24 all the corn for Pacific Ethanol. We've felt that from
25 our perspective that if we could coordinate efforts and

1 we could bring the grains in and take the starch out,
2 run the co-products back through the feed yard and then
3 have the—utilize the fat in the corn oil from the co-
4 products and not have to use tallow, we can run this
5 full circle of integrating the current program which is
6 basically the most efficient right now. That's one of
7 the things that we've been capitalizing right now to
8 pool the demand.

9 Frankly, we're a small group out here in
10 California. We produce a lot of food for the nation but
11 it's really a small group. There's probably less than
12 10 people in the country that handle 90 percent of the
13 corn that's traded in this country. California has
14 always been a very, very strong participant at the table
15 of the national grain and the international grain
16 merchandisers. We go to Switzerland for the world grain
17 conference. We're always at the Nebraska Corn Growers
18 Association as they invite us out to speak. Because we
19 consumer 9 million tons of corn we're a large player but
20 we have to stay together. From our perspective having—
21 fortunately on the dairy side, on the dairy and the
22 cattle side, we've been able to utilize these co-
23 products. We're getting to the point and the science
24 and technology is coming for the poultry guys to start
25 taking more of it. It's coming. It's slow. There's

1 also been a lot of hesitation because it's kind of a
2 political topic. That's coming. But for us it's
3 enabled us to utilized more California feeds. We're
4 feeding way more wheat than we would otherwise because
5 we've got the corn oil coming in on the CD—we're feeding
6 30-40 percent California grown wheat this year versus
7 last year that corn was imported as Midwest corn.

8 The point being having the ethanol business
9 here, producing products that we can use, has enabled us
10 to buy more California products at the feed yard. With
11 that, I thank you very much. Do you have any questions?

12 COMMISSIONER BOYD: I have no questions.

13 Thank you. But I appreciate your recognition. Since
14 you're the last panelist, I'll make a comment at this
15 point in time that I have to tell the fowl feed people
16 that I had to follow their trail through the capital
17 this last time around correcting a lot of misstatements
18 about what the CEPPI program was but nonetheless CEPPI
19 is gone.

20 My observation of all this issue, and the last
21 gentleman kind of said it, is that I think there is a
22 legitimate grievance about ethanol versus corn but to me
23 it's a product of the RFS. It's federal policy. It's
24 not state policy. So as the state tried to work around
25 it, and as the last gentleman indicated, we have to

1 figure out some kind of state solution. By eliminating
2 California produced ethanol, it didn't make one bit of
3 difference to what's happening to the price of corn. Of
4 course you heard earlier today that as a nation now
5 we're shipping ethanol now out of the country so
6 somebody now is making a whole bunch of ethanol that we
7 can't consume internally and shipping it somewhere else.
8 Some of you are paying the price, I must admit. You're
9 catching it in terms of the price of corn for feed and
10 therefore—and the price of food to a lesser degree and
11 that is a dilemma and that probably is part of the
12 reason that the Secretary and I have talked for months
13 and months and months about having this session to talk
14 more. We were a little bit with a lot of attempts to
15 try to save the ranch so to speak or something across
16 the street, the Public Goods Charge, the PIER program
17 and the reputation of the Energy Commission.

18 In any event we're going to say something
19 about this in our soon to be released later this year
20 Transportation chapter of the Integrated Energy Policy
21 Report which is something the Commission produces every
22 two years. We're going to say something about the fact
23 that based on our projections of the requirement on
24 California to utilize as transportation fuel ethanol, in
25 order to do that, the staff kind of back capped this—

1 well, how much gasoline are we going to sell, how much
2 ethanol did you put in that gasoline, that will chew up
3 some of our requirement. And then what else is there?
4 The only other use of ethanol as a fuel is so-called
5 E85. I don't see that we even have the potential to use
6 all of that ethanol. We're going to be raising a
7 question about the renewable fuel standard and whether
8 it makes any sense in California.

9 The sad part of all of this is that you heard
10 about the low-carbon fuel standard. California produced
11 ethanol has a better carbon index than ethanol produced
12 anywhere else and would be good for California to use
13 that ethanol in its transportation fuel rather than the
14 corn ethanol. The way the Air Board has the system set
15 up is that in just a few short years, California ethanol
16 virtually made out of the state, won't even comply with
17 the carbon index. What are they talking about? What
18 other ethanol in the whole world has a pretty decent
19 carbon index? It's from Brazil made of sure.

20 I predict, as I go out the door, that there's
21 going to be an incredible amount of ethanol shuffling.
22 U.S. produced corn ethanol is going to be going to
23 Brazil and Brazilian ethanol is going to be coming to
24 California and the Brazilian's aren't stupid. They're
25 going price it really high because we're going to

1 produce a huge demand for it in this state because
2 refiners have no choice but to put that ethanol into
3 their gasoline to meet the low-carbon fuel standard. In
4 the meantime, they'll buy cheap U.S. corn ethanol to
5 meet their very heavy need for ethanol as a country
6 because that's a principal fuel.

7 So something is wrong with that picture but
8 I'm running out of years to address it but maybe you all
9 can work on it. Anyway, that's way we need, as I've
10 heard here, so far, more of us talking around more
11 tables about the system and how all of these pieces fit
12 together. As a fourth generation Californian, I'm on
13 your side as the son of a large animal veterinarian.
14 I'm on your side in terms of doing something for
15 California agriculture. We really need to work more
16 together to do that. So hopefully you all can proceed
17 to do that in the future. Anyway, enough said by me.
18 We should see if there are any people in the audience
19 who have questions for this group before we go to the
20 next one?

21 SECRETARY ROSS: Thanks.

22 COMMISSIONER BOYD: Next panel.

23 MR. RILLERA: I'd like to invite the Biofuel
24 Panel up.

25 MR. KOEHLER: Chairman Boyd. Secretary Ross.

1 Thank you very much for putting this together. This is
2 already, I think, a very productive conversation and a
3 lot of information exchanged. This is a critically
4 important effort and opportunity to get everybody
5 talking together because we are together when you talk
6 about the biofuels industry and the agriculture
7 industry, we're one and the same.

8 On sort of a global basis, there was a time
9 for more of the time until we found that liquid gold
10 called oil where agriculture produced all of the food,
11 the feed, the fiber and the fuel for this country and
12 the world. We've had a little excursion with the
13 petroleum blip which will be a blip, we'll have to find
14 replacements for that. We won't be going back to
15 growing hay as the fuel. It will be the use of science
16 and technology as we've been hearing in new fuels. But
17 if we can't bring fuel back to the farm through
18 agriculture and what the ethanol industry has done in
19 the United States has been an incredibly successful
20 model of how to do that, than we will have a problem
21 sustaining a future.

22 I'm Neil Koehler, Pacific Ethanol but I'm here
23 today representing a newly formed group called the
24 California Advanced Fuel Coalition. We are working with
25 not only the exiting biofuel producers but the future

1 biofuel producers in the state of California, vendors,
2 suppliers to that industry, labor unions because it
3 takes all of us to have produced the fuel in the ground
4 that we've gone today that the four ethanol plants,
5 three of which are running today, but we are absolutely
6 the platform and the future for the new technology. We
7 want to make sure that we had a voice that wasn't just
8 corn ethanol here in California but was really what this
9 industry represents which is the vanguard. The ethanol
10 produced in California today is the most advanced,
11 commercially available biofuel in the United States
12 today. That was mentioned about the lower carbon
13 intensity, wet distillers grain as the cleaner source of
14 electricity in California, corn oil extraction, other
15 initiatives in the conventional process that every
16 producer here is making.

17 We're also all very engaged with any number of
18 initiatives to develop the new cellulosic technology.
19 Other chemicals from ethanol. Using the existing
20 infrastructure because that's a very valuable and
21 important opportunity to leverage that. We think that
22 that is a very good and real opportunity and is not a
23 bridge to these new technologies, it is really the
24 bridge. At some point we'll see greenfield, cellulose
25 ethanol plants and we'll also see other conventional

1 plants. You'll hear from David Rubenstein on sugar
2 cane and so we're already diversifying the feedstock,
3 diversifying the technologies and it's all about a
4 coherent policy that we've had at the federal level and
5 more of late in the last couple of years at the state
6 level which becomes critical to sustaining this
7 opportunity.

8 We've heard a lot about high corn prices. I
9 think the studies have shown that while ethanol use has
10 been a contributor, it's a small contributor. There's
11 plenty of other factors at work. We see, obviously,
12 high commodity prices in all, not just the agricultural
13 commodities but the precious metals so this is not
14 something that is specific to corn.

15 The one thing that is specific to corn and the
16 ag commodities that what we've seen a result of high
17 commodity prices is an incredibly vibrant, positive
18 agricultural economy. That's lost on a lot of people.
19 There's complaints about the poultry economy, everybody
20 else complaining about their inputs. We're all part of
21 an agricultural system that's doing exceedingly well in
22 a time when so many industries, so many countries,
23 states, California we're all looking for jobs and new
24 industry. Here we have in the state of California a
25 national, agricultural economy that is doing so well and

1 can help us leverage that into new businesses. New
2 jobs. New economic development.

3 In terms of my remarks because they'll be some
4 specific comments on other projects, it is really
5 addressing some of the larger issues on the policy
6 front. We do need integrated policies. At the federal
7 level, we have an ethanol industry because of the
8 blenders credit and the renewable fuel standard.

9 The blenders credit is due to expire at the
10 end of this year. The ethanol industry, we were
11 actually one of the first companies to say it has served
12 its purpose. We're not 10 percent of the gasoline
13 supply in the United States. No other fuel has come
14 anywhere close to making that kind of petroleum
15 displacement. It's done its job.

16 The fuel is very cost competitive. It's
17 typically lost expensive than gasoline even without the
18 blenders credit and we can do our part to help close the
19 federal budget deficit, let's let that expire. The
20 renewable fuel standard is the real driver. It is 15
21 billion gallons of corn based, conventional ethanol and
22 then another 21 billion gallons of something else.
23 That's where the opportunity is in California. Lots of
24 noise and chatter about the RFS. The corn ethanol is 15
25 billion gallons, we're almost at 14 billion today.

1 There's another billion as a mandated requirement.
2 That's pretty much in the system in terms of plants that
3 either shut down like the one here in California,
4 Madera, or other construction so it's pretty much there.

5 Now it's all about where do we go from here?
6 How do we get to that 36 billion gallons which will keep
7 that billion dollars a day that we're sending overseas
8 right here in reinvestment and in our rural economies
9 here in the state of California and elsewhere in the
10 country. So the RFS is critical.

11 Commissioner Boyd, I appreciate your comments
12 about the RFS and how that's configured. Probably there
13 are some appropriate adjustments as to how that rolls
14 out but it's that long term policy that sends a signal
15 to companies like ours, industries like ours, the
16 capital markets that we are going to have these fuels so
17 let's start investing in them. It's critically
18 important as a policy that doesn't cost taxpayers
19 anything; in fact, it saves them a tremendous amount of
20 money by keeping those dollars at home and reinvesting
21 it.

22 We've seen that with the existing industry.
23 It's not a zero sum game. The fact that ethanol has
24 grown to not using 42 percent of the corn crop suggests
25 that maybe one of those things that maybe you had to

1 correct in the legislature but in the net basis I
2 thought there was a very good presentation from Doug
3 Dickson about the integration and the feed. When you
4 take out the feed, it's 25 percent of the corn crop.

5 If you look at the 300 percent of productivity
6 in 60 years on corn production, we've actually produced
7 more corn on the same acreage, more corn than was needed
8 to produce that 13.5 billion gallons of ethanol that we
9 will produce this year.

10 It is the price signal. It is the policy that
11 sent a message to private industry, in this case the
12 American farmer to produce and to produce, to produce,
13 to produce. And then the industry to have markets for
14 that product. Our problem with that agricultural
15 production is historically not not enough. It's too
16 much. It's surpluses. The ethanol industry has been a
17 critical part of diversifying the markets and giving
18 farmers an opportunity to sell their products at a price
19 where they can afford to make a fair wage, a fair living
20 and the taxpayers with billions of dollars of taxpayer
21 support is now not going to farmers because of those
22 price signals and that's very good.

23 Federal policy has made it happen. We're
24 here. The next step is how do we get to the advanced
25 biofuels. That's the real opportunity in California.

1 We will probably not build any more corn ethanol plants
2 in the state of California. They're a relatively small
3 part of the energy picture here but critically important
4 to that platform to get us to the advanced biofuels. I
5 said we're all working to do that.

6 California actually has a very well integrated
7 policy framework to help make that happen. We have the
8 Bioenergy Plan that says 20 percent of the instate
9 biofuels should be California produced by 2010. We're
10 not there but we're 12 percent. We actually have made a
11 reasonable achievement but we can do better, we can do
12 more. It's 40 percent by 2020 and 75 percent by 2050.
13 Pretty aggressive goals.

14 The low-carbon fuel standard. We've had a
15 fair amount of conversation about that. A 10 percent
16 reduction of carbon intensity backloaded. That's a huge
17 objective that we're going to have to get to those
18 advanced biofuels or what Commissioner Boyd, you're
19 talking about shuffling which incidentally is happening
20 today. The boat from Brazil showed up in California
21 this week. It's probably offloading in Northern
22 California today. It costs about \$1.25 gallon more to
23 bring it to California so that they can get advanced
24 biofuel credits and double down on low-carbon fuel
25 standards. I don't think that's really the objective of

1 those policies. It's certainly going to hurt consumers
2 in California and will hurt efforts to build an
3 industry.

4 We need to address those issues. That's a
5 whole series of workshops of its own but we need to look
6 at those unintended consequences and strange market
7 reactions to that. The low-carbon fuel standard is a
8 real driver to help move that.

9 The state program, the CEPIP, yes, it's gone
10 now. We thought it was a very good program to help
11 insulate the California new industry, undercapitalized.
12 We still think it was a good program and we still think
13 it should be funded. If we can rally around the low-
14 carbon fuel standard and make sure that we're protecting
15 California industry and sending the right signals, we
16 will get a premium price for our product. We've gotten
17 a small premium this year, in the first year of the low-
18 carbon standard, that should be quite a bit larger in
19 subsequent years. That's where we need to stay
20 consistent with that.

21 We have the State Alternative Fuels Plan of
22 2007 which was reducing petroleum dependence by 15
23 percent by 2020. We haven't done that but we've made
24 some progress. Virtually all of that progress has been
25 due to ethanol use in the state of California. AB 32

1 climate change, all of these is integrated. They're
2 all actually consistent and very coherent.

3 AB 118 is the funding to help realize these
4 goals. It's a noble effort. I know that there's been
5 some criticisms of it, about how the money's been spent.
6 I think the Energy Commission has done a very laudable
7 job of directing those funds and certainly, we're there
8 to help support that program and try to build those
9 advanced biofuels. They are more expensive. They are
10 going to take policies that send the right pricing
11 signal and some seed investment dollars and that's what
12 AB 118 can do to make that happen.

13 With all of this, we need close, collaboration
14 between all stakeholders. It's government. It's
15 private industries. It's why this is such a good
16 effort, bringing us together, bringing industries,
17 summon the feed industries who haven't always been
18 supportive of the ethanol. Let's figure out how to work
19 together because we're in this together. We're your
20 suppliers of very high quality, low cost feed. It's the
21 university system. We need the science and exploration
22 and development of these new technologies.

23 The agronomists, there's increasingly more
24 focus—we talk about waste and, well, waste is nice but
25 how do we collect it, how do we get it on marginal

1 lands. Maybe there are some opportunities on the
2 purpose crops but it really needs to be a focus. As an
3 industry, we have companies in our group that are
4 working on some brand sweet potatoes that are 25 percent
5 starch on them and as is matter basis, 75 percent
6 starch. We can grow those in California. They're
7 working on sugar cane in imperial valley. There's
8 actually an interim step to the more advanced cellulose
9 technology of using existing starch and sugar crops that
10 we actually can grow in the state of California to meet
11 our objectives but we all have to work very closely
12 together to make that happen.

13 As I said, we've seen this in all of our
14 plants. We're working on biomass cogeneration in
15 Stockton to lower our carbon footprint further, lower
16 our energy costs. We've paid a lot for energy relative
17 to our Midwest competitors. That's recognizing an
18 objective of lowering the cost and lowering the carbon
19 intensity.

20 AE Biofuels has a company that they purchased
21 that has cellulose and the ability to turn starch into
22 other chemicals such as a rubber replacement. They're
23 doing the methane digestion. The beautiful, full circle
24 project in Pixley at Calgren. They, through Energy
25 Commission support, are putting a digester in to

1 pipeline manure into a digester that will produce the
2 methane to fuel the ethanol plant that will produce the
3 feed to go back to the dairies to produce the manure to
4 go back to the ethanol plant.

5 These are all incredibly positive and valuable
6 developments and, again, we're all working together to
7 make it happen.

8 In terms of what needs to be done, this
9 opportunity today in my mind represents something that
10 is big, if not bigger, than the dot com development in
11 California in the last generation. The cleantech, bio
12 energy development in the state of California, focused
13 in the Central Valley of California but not exclusively,
14 where the jobs, economic development and investment are
15 most needed. This is an absolutely huge opportunity
16 that we cannot use sight of and can't take our eye off
17 the ball to make it happen; to bring those jobs, that
18 economic development, clean energy, energy dependence.
19 All the things, the goals that come together as part of
20 this.

21 We need continued financial support, in
22 recognizing limited budgets it's not a lot but that seed
23 money that help gets these innovative projects off the
24 ground and then continue to be consistent, coherent, if
25 we need to make changes but let's keep those policies

1 out there that are longer term. The renewable fuel
2 standard that says yes, all the new incremental biofuels
3 has to be something other than the conventional to meet
4 the requirement. The low-carbon fuel standard which is
5 driving that innovation. So there's lawsuits, there's
6 concerns about indirect land use. Let's clarify all
7 that and let's move forward so we know what the rules of
8 the game are because that's the only way that the
9 capital is going to come in and take the risk.

10 We need to reconfigure the predictive model
11 and the gasoline regulations at the California Air
12 Resources Board. E15 has been approved by the EPA for
13 the newer vehicles. There is an absolutely need to be
14 able to take in the volume from the renewable fuel
15 standard to have the access to higher level blends.
16 It's not going to be all the E85.

17 We need to start working today because it
18 takes some time to reconfigure the regulations to allow,
19 to optimize the predictive model around 15 percent
20 ethanol blends. That is very, very important. I've had
21 conversations with Mary Nichols about that and others at
22 the Air Board and it's something that given that time
23 lag, I think that all of us as stakeholders and fellow
24 agencies need to start pushing on that.

25 We need to require that new cars sold in

1 California—California has the luxury of being able to
2 tell car companies, just as we do with emission
3 regulations, on what kind of cars are sold in
4 California. If every car sold in California, just as
5 they are in Brazil, if California could take this
6 initiative and say all new cars sold in the state,
7 starting date certain will be flex fueled. It would
8 cost the car companies less than \$100, probably less
9 than \$50 today to do that. We could then have ethanol
10 from the Siemens process, ethanol gasoline, any
11 combination of cars, truly flexible fueled vehicles.

12 We talked about mandates for ethanol. The
13 real mandate is petroleum. We all know that. The
14 renewable fuel standard has given access to something
15 other than petroleum. We've got a small bit ahead by
16 being a few percentage points but we've got to open the
17 market. There has to be access to the market for these
18 new fuels. These are the kind of initiatives that would
19 make them happen. E85, blender pumps, all of this—there
20 are California regulations that need to be adopted to
21 make that happen.

22 We need to be clear about this and ultimately
23 we need to, Commissioner Boyd we appreciate your efforts
24 in doing this because that has been so much
25 misinformation about ethanol and what it is and what it

1 isn't, we have to stand up for the truth. When things
2 are said that aren't true about our fuel and about the
3 opportunities, we all need to collectively to have the
4 courage and the strength to say, "No. That's wrong.
5 This is what is really going on. This is the
6 opportunity. And it's one heck of a positive and bright
7 future for the state of California with biofuels and
8 bioenergy." Thank you.

9 MR. HUTTON: Morning, Secretary and
10 Commissioner. My name is Matt Hutton. I'm here
11 representing California Polytechnic State University in
12 San Luis Obispo where I'm a member of the Algae Research
13 Group. So I'll talk to you a little bit today about
14 what we do there and then the state of the industry in
15 California.

16 So it's a pretty big research group, as
17 university groups go, it's 30 people right now led by
18 Dr. Trig Lundquist who some of you may know.

19 Here's a little bit of background on algae.
20 It's probably the most productive biomass that we'll
21 discuss today. Up to 70 tons per acre per year which is
22 maybe 10-15 times as productive as corn. Of course,
23 there are corollaries to that statement. It's quite a
24 bit of capital investment to get more growth, capacity
25 for algae growth in the state of California.

1 Between 1-5,000 gallons of that biomass per
2 year could be oil. There are several options for
3 converting algae biomass into fuel. Some of them more
4 readily commercializable in the short term and others
5 that require longer terms research efforts. Things like
6 biogas and gasification could be deployed really near
7 term, maybe potentially even tomorrow for biogas.
8 There's more research required to commercialize algae
9 oil.

10 In the meantime while these research efforts
11 are underway, there are co-products that can lower the
12 fuel costs of algae, fuel production, things like
13 wastewater treatment which is particular applicable to
14 the agricultural industry of California and especially
15 the Central Valley where algae can be used to treat
16 subsurface ag drainage and also just municipal
17 wastewater throughout the rest of the state. It can fix
18 about 5,400 hundred pounds per acre year of nitrogen
19 which is really a big potential benefit to the
20 agricultural industry here.

21 While growing that biomass, algae can also
22 produce other higher value products that might help the
23 industry get over that hump to a longer term
24 commercialization of algae for biofuels use. Things
25 like fatty acids, omega 3 fatty acids that can be used

1 in nutritional supplements. Algae also can grow about
2 13 tons per acre year of crude protein which can be used
3 as an animal feed.

4 One of the things that really recommends algae
5 as a feedstock for biofuels is that it completely avoids
6 the fuel versus food dilemma or it can because it can be
7 grown on non-variable land with low quality water and
8 waste nutrients. We also have an existing
9 infrastructure herein the state of California with full
10 scale wastewater treatment ponds operating with algae
11 since the late 60s.

12 That's what these look like. Most of these
13 pictures are from the state of California. When I bring
14 up ponds, this is what I'm talking about, just big
15 shallow, algae growth containers, basically.

16 A couple of different ways algae can be used
17 to produce fuel. Two of these are gaseous, two of these
18 are liquid. Ignore the complicated box and the arrow
19 diagram. I'd like to focus just on digestion, anaerobic
20 digestion and oil extraction. All the way to the right
21 of this graph here you can see the digestion pathway
22 which might be expected to produce about 250,000 cubic
23 feet of methane per acre per year of algae growth ponds
24 and also a potential for 1-5,000 gallons per acre year
25 of oil as I mentioned earlier.

1 So talking about oil, a friend from the CEC
2 emailed me a couple weeks ago and posed this question, a
3 casual question, about what it would take to get algae
4 oil to replace a significant portion of the fuel that we
5 consumer in the United States. We used about 300
6 billion gallons per year of petroleum products in the
7 United States. A recent report from one of the national
8 labs, Pacific Northwest National Laboratory, estimated
9 that there are about 100 million acres of noncompetitive
10 land that could be used for algae growth in the United
11 States. If we wanted to satisfy the entire demand using
12 that available land, it would require that our algae
13 growth ponds produced about 3,000 gallons of oil per
14 acre year. She asked if this is a reasonable thing, to
15 expect algae to do that? To which my response was the
16 productivity is not out of the question. 3,000 gallons
17 per acre year is definitely possible with algae.
18 Whether or not that can be conducted over 100 million
19 acres is an entirely different question. That would be
20 pretty impractical. And that's fine because no fuel
21 could really replace everything petroleum has done for
22 us up to this point, that would require alcohol fuels,
23 gaseous fuels as well as oils.

24 I said to her let's look at this in a slightly
25 different way and say, "What's the component of the fuel

1 consumption in the United States that's most firmly
2 entrenched?" In other words what application that we
3 consumer fuel for really requires oil and can't be
4 switched over to an alcohol fuel and that's aviation.

5 We consumer about 12,600 million gallons of
6 oil in the aviation industry in the United States in
7 2008. So at a productivity rate of 3,000 gallons per
8 acre year, we would only require 4.2 million acres to
9 grow enough algae to satisfy that entire demand. Much
10 less daunting, especially given the fact that here in
11 California along we have 400,000 acres, give or take, of
12 salinized land in the San Joaquin Valley region and even
13 more in Salton Sea region. It's difficult to use for
14 anything else so there might be a good spot to grow
15 algae.

16 If we're going to do that, what would be some
17 of the technical challenges that we would face? Always,
18 always, always growing more oil per acre improves the
19 economics of the entire thing and the solutions to that
20 challenge are really things that just require basic,
21 basic research like controlling pests in algae growth
22 ponds which there's research underway in the state of
23 California right now on and also genetic modification of
24 algae which is a much longer term, I think, potential
25 solution. Also, harvesting algae requires a lot of

1 energy. We're researching right now at Cal Poly
2 bioflocculation and settling of algae which is kind of
3 getting algae to harvest themselves in a way. That
4 effort has been successful thus far and continues right
5 now under CEC funded grants. Also filtration is a
6 potential harvesting mechanism.

7 Another challenge is dewatering algae. In
8 order to use it as a fuel or a feed, it's important for
9 a lot of applications that algae is completely dewater
10 which consumes a ton of energy. There are new screw
11 press technologies kind of in the pipeline right now
12 that are being piloted in the state that could help with
13 that and also solar drying I think could play a big
14 role.

15 Oil extraction with less energy that's big
16 challenge. That takes chemicals and lots of energy to
17 get the oil out of algae since they have tough cell
18 walls but some potential solutions there, super critical
19 CO2 extraction like the technology that's used in
20 decaffeinating coffee or defatting milk, for example. A
21 lot of the time or hot oil extraction. Both of those
22 are being researched in the state right now too.

23 Given that those challenges are absolved, what
24 would be the biggest market challenge is that at this
25 point and I think the biggest immediate challenge would

1 be the economy as a scale. Right now there are
2 extraction plans in the United States that can process
3 oil seeds and get tons of oil throughputs per day.
4 They're a little bit larger, I think, than might be
5 practical in the algae, biofuels industry in the near-
6 term. A recent report that we conducted estimated that
7 it would require 1,000 acres of algae growth to make a
8 conventionally sized extraction plan to pencil out
9 financially.

10 Development of small scale extraction
11 technology and just small scale technology in general to
12 kind of decentralize bits and pieces of this industry
13 and reduce transportation costs would really be a big
14 benefit to the development of the fuels. Then also
15 collocation of resources. At least I go to a lot of
16 conferences where people throw out numbers and say, "Oh
17 we've got so much waste CO2 here in the United States.
18 We can use it all to grow algae." Well, you really
19 can't. Believe it or not it's really hard to get it to
20 one place, especially if that place also has a
21 requirement of flatland so that's a big issue.

22 Just to bottom-line this for everyone, in the
23 same report we estimated that, with no co-products being
24 produced with the algae, that we could produce oil at
25 about \$300 a barrel in the near term. That's relatively

1 close, 5 years or something like that. And \$225 a
2 barrel, a little more toward the mid-term. Now if co-
3 products were taken advantage of, say wastewater
4 treatment or there was some revenue from animal feed
5 being produced along with this biomass, you could bring
6 the cost of a barrel produced using algae down to
7 potentially around \$30 a barrel which is much better.

8 Okay. I was asked to prepare a little bit
9 about the landscape of the industry here in California.
10 These, really crudely by the scale of their funding, are
11 companies that I've decided to talk a little bit about.
12 Solazyme out of South San Francisco is focused on
13 fermentation. They use sugar to grow their algae which
14 is an industrial process that's contained in stainless
15 steel vats. It's really more similar to something like
16 a pharmaceutical production process than an agricultural
17 process. But I think it's indicative of a broader
18 market trend which is to try to establish this industry
19 and let it grab a foothold using higher value products
20 so that they can grow algae in high cost facilities in
21 the near term and sell it to produce things like
22 cosmetics which they've done, I think they have a deal
23 with Unilever now, and also selling feedstocks to the
24 nutritional industry.

25 Sapphire Energy out of San Diego is really

1 more focused on the long term development I think with
2 genetic modification of algae and things like that.
3 They have a demonstration facility planned.

4 And then Aurora Algae in Hayward. Again
5 focused on higher value products in the near term,
6 pharmaceuticals, supplements, things like that. They
7 have a demonstration plant here in California as well as
8 one coming online in Western Australia shortly.

9 Certainly not as highly funded is the Cal Poly
10 Research Group also with Micro Bio Engineering which is
11 a company that I'm involved in along with Dr. Lundquist
12 which has partnered with the CEC on a couple of
13 projects. A few of them were part of the PIERs program.
14 What we're focused on is algae production with treatment
15 of wastewater. So municipal wastewater and also
16 agricultural wastewater, these are things that we feel
17 are really near commercialization and some of the
18 infrastructure already exists in California, in fact, to
19 take advantage of these things. There are sites
20 throughout the state where algae is grown, tons of algae
21 a day for the treatment of wastewater and really the
22 biomass is more of a nuisance to them than it is are
23 resource. So I think that by digesting that
24 potentially within the next few years, we could really
25 turn it into a resource.

1 I just wanted to include some quick pictures
2 of our research facilities which are also CEC funded.
3 We have 935 square meter ponds that we're nearing
4 completion of. When we finish these in San Luis Obispo
5 this will be the largest demonstration plant of its kind
6 in the United States. Probably actually in the world
7 now that the earthquake in New Zealand has wiped out the
8 ponds there.

9 We also are set up to do smaller batches with
10 small ponds and settling experiments to research
11 harvesting of algae by bioflocculation, laboratory
12 facilities, chemistry on oil products and biogas and
13 then we all have a large feed mill which is industrial
14 scale and has been used for algae feed trials in the
15 past.

16 A few of the different types of studies we've
17 done. With that, I'll open it up to questions if you
18 have any. Okay.

19 COMMISSIONER BOYD: Thank you. Thanks for the
20 commercial about what the PIER program does. Trouble is
21 it's the wrong audience. In any event.

22 Just a comment on my part, not a question,
23 that I for one having studied fuels for a long, long
24 time do feel that the world faces a diesel fuel problem
25 and so this is a very interesting approach to providing

1 maybe some supplement to the huge demand there will be
2 once the world economy straightens out on diesel fuel.
3 And I think you've identified a couple of real potential
4 areas for this type of fuel and this type of approach to
5 revising it. I'm glad we're part of it together.

6 MR. HUTTON: Thank you.

7 MR. PELLENS: Good morning, Secretary Ross,
8 Vice-Chair Boyd. I'm Brian Pellens with Great Valley
9 Energy. I wanted to talk about the work that we're
10 doing under a grant from the CEC, funded under AB 118,
11 we're one of the three projects that were chosen for
12 funding under the advanced biofuels initiative. We're
13 studying the feasibility really of using fractionated
14 sweet sorghum as a purpose grown energy crop to produce
15 biofuels and other products.

16 Sweet sorghum-ethanol produced from sweet
17 sorghum would qualify as an advanced biofuel under the
18 RFS. It grows well here in the Central Valley and, more
19 precisely, in the San Joaquin Valley as Mark Jenner was
20 showing in one of his slides. It's a low water use
21 plant. We've got irrigation trials that are going on
22 right now under the joint CDFA CEC PIER study. We've
23 got irrigation rates in the upper teens and low 20s with
24 that, just per acre.

25 Importantly as the subject of what we're

1 doing, it can be fractionated up front. When I say
2 fractionated, I mean we are taking that plant stock and
3 separating it into three or four, depending on how you
4 look at it, distinct physically and chemically distinct
5 pieces that can be used to make other value added
6 products. I use some terminality when I speak, if you
7 figure me if you haven't heard of these before, but
8 they're not in common language and sometimes I forget
9 that.

10 The dermax, when I talk about the dermax
11 that's the epidermal, outer layer. It's got a waxy
12 deposit on the outside of it. I considered actually
13 bringing some here but I chose not to. I had to start
14 my day a little early today. Anyways, there's a wax on
15 the outside of it. It has a pretty rigid outside and
16 then inside is a softer, pithy material that has the
17 majority of the juice and really what we're looking at
18 for biofuels, the sugar.

19 We're working with a company called KTC Tilby
20 that's developed this process for the separation. It's
21 been implemented in Mexico on sugar cane. We're going
22 to use it for sweet sorghum.

23 They've actually turned some of the—these were
24 actually all made from sugar cane but they've turned
25 that into some products. It's kind of a visual

1 representation of how the process works. It's not
2 entirely accurate the way that it works now.
3 Essentially there's a series of wheels and blades that
4 effects the separation.

5 The other products that we've identified that
6 could be made are things like lumbar products, oriented
7 strand boards, cement board, that sort of thing.
8 There's food grade waxes, pharmaceuticals, animal feed
9 could be and of course ethanol or other biofuels that
10 would rely on a sugar platform.

11 So really what we're moving toward here is a
12 biorefinery model and so we'll be trying to maximize the
13 profitability and flexibility of the final facility once
14 it's built. This really follows the oil refinery model
15 which can produce many different kinds of products and
16 fuels.

17 Just to give an idea of where we see, on a
18 proforma basis, the difference between the input of
19 sweet sorghum and what the output value might be. We're
20 looking at the weighted value of products. This isn't
21 even a really high value cause of about \$84 a ton of
22 products coming out of the backend of the facility. We
23 think that's a multiple of what the incoming feedstock
24 would cost.

25 Sweet sorghum is an interesting feedstock.

1 It's been studied in California for decades. There's
2 been a lot of work done on it. We think that we'll be
3 able to get two crops per year in the San Joaquin
4 Valley. It's uncoupled from the commodity market. It
5 will grow on marginal soils. It will grow with
6 recycled, reclaimed water. There's actually some
7 evidence that it might be beneficial to grow it on salt
8 impacted lands, that's one of the things that we're
9 going to be looking at.

10 It's small scale, the way that we have this
11 business set up but it is scalable and we think that we
12 can produce sugar based ethanol that's comparable to
13 corn ethanol pricing. Sweet sorghum grows just about
14 everywhere that there's people. It's going to grow well
15 here because we get a lot of heat in the San Joaquin
16 Valley and so it likes the heat and it will regrow after
17 its cut initially, it's called the ratoon. The ratoon
18 crop will reuse the root structure that's already there
19 so it doesn't take nearly as long to get the second
20 cutting back out. The sugar yield is a little lower for
21 that ratoon crop.

22 As far as the low-carbon pathway, this is
23 based on CEC staff estimates that put it at about an 84
24 percent decrease below the low-carbon fuel standard
25 baseline for California gasoline for the ethanol

1 pathway.

2 We've got a good project team with Great
3 Valley Ethanol, KTC Tilby is our technology partner for
4 the separation requirement. We're working closely with
5 the CBC in UC Davis. We'll be bringing in some other
6 folks that are listed there as well that have not yet
7 been identified. We also work very closely with W.M.
8 Lyles which has a long history of biofuels development
9 here in the San Joaquin Central Valley.

10 So where we are right now is in Phase I of,
11 basically, a three phase build out. We're in the pilot
12 phase. We have a 1 ton per hour separation system which
13 should be on its system today, we expect to get it next
14 week. We've got the crops ready to be harvested and so
15 we'll be running separation trials with that equipment
16 very shortly. We'll be taking samples of that material
17 and sending it off to laboratories for analysis to
18 provide input for key characteristics for products that
19 we could make out of that. We'll also be measuring the
20 yields that we get out of that processing equipment for
21 each of the different fractions.

22 This program is funded through the CEC grant.
23 Funding goes through 2013. We hope to have
24 substantially all the information that we would need to
25 move into the Phase II demonstration schedule sometime

1 next year. In that Phase, we will build a 10 ton per
2 hour processing facility and really demonstrate the
3 whole field to—and all the logistics from growing to
4 scheduling and harvesting right through the whole or
5 processing at the facility.

6 At this point we think we may have some
7 pelletizing for biomass there. We will either have
8 sugar juice that can send to an existing ethanol
9 production facility here in California or we may ferment
10 to a beer and transport that material for distillation.

11 After that demonstration is done, our next
12 step up is a 5X expansion probably at the same site.
13 When we do that, we expect to have about 4,500 acres of
14 sweet sorghum production but if we're able to get 10
15 percent of nearby acreage to change over to sweet
16 sorghum production, trucking distance will be less than
17 10 miles, significantly less.

18 We're targeting a mid-2016 start up. At this
19 point, we think it will be a \$60 million project. It
20 should have an 8 million per year biofuel capacity.

21 Importantly, we'll also have about 1,000
22 pounds per day of biomass feedstock that we'll make into
23 other products in addition to the processing of the
24 dermax for the wax and the bioactive compounds.

25 So there are several drivers of why we think

1 this is a really good idea. One of them is the price
2 for U.S. based sweeteners as a proxy for what it may
3 cost for a producer to make biofuels from a sugar based
4 platform. Right now, we anticipate as a fully loaded
5 price, not a breakeven price, but a fully loaded profit
6 and included price of being able to get it into the
7 market at less than .20 cents a dry pound which is
8 significantly less than the U.S. markets.

9 In addition, with the low-carbon fuel standard
10 we suspect that we'll be displacing, and maybe this
11 graphic is incorrect, but we won't be displacing
12 California corn ethanol but we'll probably be displacing
13 Brazilian sugar cane ethanol but in any case with the
14 lower carbon footprint that we'll be able to provide, it
15 should take less than that ethanol to meet the low-
16 carbon fuel standards and with an 84 percent reduction
17 in carbon, this ethanol made from this sugar platform
18 would be able to help me beat the carbon decrease in
19 2020 with at a 12 percent level. So we still would need
20 to blend, even with this, above 10 percent.

21 You know we're a start up at this point and
22 everywhere we look are obstacles to getting this done.
23 There's a lot of uncertainty out in the marketplace
24 right now, a lot of financial uncertainty, as I said,
25 we're going to need to raise capital. We've got several

1 programs that have been very useful in the past and
2 there's some uncertainty whether they will be available
3 for us when we're ready. The BCAP Program, the loan
4 guarantees. Those would all be very useful for us. In
5 addition, when the blender credits expire and the
6 tariffs expire, what's going to happen to the biofuels
7 market? I think when we actually get to the point where
8 we need to raise significant cash, a lot of those
9 questions will be answered.

10 So those are some of the things that we see as
11 possibly holding us up. And I'm available for any
12 questions if you have any.

13 COMMISSIONER BOYD: Thank you.

14 MR. MILLER: Hi. This is Scott Miller from
15 the Wasted Fuels Conference which is being held-

16 MS. TATE: Sir. Sir. I'm very sorry, we have
17 one more speaker and then we're opening it up to
18 questions. My apologies.

19 MR. MILLER: Okay.

20 MR. RUBENSTEIN: It's tough being the last guy
21 in the audience here.

22 Secretary, Commissioner, Staff. Thank you
23 very much for the opportunity to address this forum
24 today. Dave Rubenstein. I'm with California Ethanol
25 Power and we're in the process of developing a sugar

1 cane and sweet sorghum facility in the Imperial Valley.

2 There's a diagram of what we believe the plant
3 is going to look like. It would be producing 66 million
4 gallons of extremely low-carbon ethanol, 49.9 megawatts
5 of renewably produced electricity, and 880 million cubic
6 feet of biomethane as well as 27,000 tons of organic
7 fertilizer.

8 We're working with Uni Systems de Brazil which
9 is an engineering firm out of Brazil and has offices in
10 Miami. They are doing the engineering for us and, proud
11 to say, we just received our copy of the Phase II
12 Engineering Report from them which is going to be
13 submitted to the Bank of Brazil to see if we can get
14 financing from the Bank of Brazil for this project.

15 I've put some slides on here showing some
16 projects that Uni Systems has built throughout the
17 Americas, Costa Rica, Venezuela, Argentina, Brazil.
18 They're building a sweet sorghum to ethanol facility in
19 Florida. So these are some of their earlier projects.

20 We've teamed up with Fagen out of Minnesota.
21 They've built 70 percent of all the corn ethanol plants
22 throughout the U.S. and very capable and a quality
23 construction group. We're pretty pleased to have both
24 of those on our team and both firms made significant
25 investments in the company.

1 Here's a biggie for us. We had an economic
2 impact analysis done at the end of last year, I wish it
3 had been done a little bit sooner for when we had
4 applied for AB 118. Pretty significant economic impact
5 for the state of California and the Imperial Valley in
6 particular. The highlights would be that during the
7 course of construction, the first couple of years of
8 operation, almost a billion dollars of gross site
9 economic output and 8,800 total jobs, that's fulltime,
10 part-time, direct and indirect jobs for each project.
11 So pretty significant impact.

12 One of the things that we like to throw out
13 there, as many of the other speakers have talked about,
14 is that California importing foreign oil. 300 million
15 barrels will probably be imported this year, at \$90
16 bucks a barrel, that's \$27 billion that we're just going
17 to be shipping out overseas. Dollars we'll never see
18 again. And if we could kind of ramp that down a bit.
19 \$74 million a day, \$3 million an hour, \$51,000 a second
20 or \$850 every second. Pretty significant.

21 Currently in California we've talked about it
22 being 10 percent blended. We think that it will
23 eventually get up to 15 percent. Everybody knows about
24 the low-carbon fuel standard, the renewable portfolio
25 standard which was just increased this past year and the

1 Air Boards cap and trade program, we believe all of
2 these will continue to drive investors to our project.

3 I did my slide here just a bit different. It
4 shows you what the carbon intensities are of the various
5 fuels. We had lifecycle associates do an estimate of
6 ours which turned out to be 15 grams per megajoule so
7 pretty excited about that.

8 Here's a blog that came out a few months ago.
9 We talk about California being able to get ethanol, low-
10 carbon ethanol from Brazil, there's a huge demand for
11 that and we've actually had folks from Toyota who have
12 come over to see if they can get some of the portion of
13 the ethanol when we start to ship that to Asia. The
14 low-carbon fuel center isn't just here in California.
15 We'll see that right now there's certain reports that
16 say by 2020, there'll be a 130 percent increase for the
17 demand out of Brazil and we could be looking at 5
18 billion gallons of deficit for low-carbon fuels.

19 This was just kind of a market price that came
20 out on August 23 to give you an example a little bit of
21 what we're looking at and what we have to present to our
22 investors. Ethanol was about \$3 a gallon in LA and the
23 advanced biofuel RINs that go with it were \$1.22. It's
24 a pretty good opportunity to get involved with the
25 project.

1 Imperial County has a terrific report that
2 comes out every year and they show what the acres are,
3 what the various crops are and what the value of those
4 crops were in the past. From 2010 you can see this is
5 how it all falls out. We would be in the field crop
6 category of 350,000 acres, producing \$360 million of
7 revenue.

8 Interestingly, in 2010 there was about—acres
9 were down by about 7,000 acres which was about 1.3
10 percent but tithe values had gone up significantly that
11 they were able to get \$145 million extra revenue or
12 about a 10 percent increase.

13 Here's the USDA greenhouse down in the
14 Imperial Valley and this is just to show you some of the
15 work that we've been doing. We brought sample tissue in
16 from other states and we grow them in the greenhouse, we
17 put them in the fields, we harvested and then we
18 replanted again. So that's what our process is now. To
19 try to grow our acres so that we'll have enough acres by
20 the time the plant comes online hopefully in about three
21 years.

22 This picture was taken a week ago last Monday.
23 We had some folks in from Syngenta and those are the
24 sugar cane fields that we're actually keeping in
25 production right now. And this is at the research

1 station, we're doing a sweet sorghum test with Monsanto
2 and this is the research station that they have.

3 This kind of goes back to the book that I
4 showed you a moment ago from Imperial Valley. And it
5 shows how—what we're thinking about doing is about
6 40,000 acres of sugar cane that would be grown in an
7 annual basis and we think that there would be an
8 opportunity to grow sweet sorghum on a seasonal basis
9 which does a couple of things. It's not necessary for
10 us to do this but we think that it's going to work out
11 to the advantage of the project. We want to take the
12 sugar cane out of the field in the summer months when
13 it's a prime growing time, when it's so hot and the
14 sugars are screaming. So we would fall into this
15 category and if you see where alfalfa is 136,000 acres,
16 producing about \$130 million of revenue. If you took
17 the combination of our sugar cane and sorghum, we would
18 have about 74,000 acres but you could do other crop son
19 the sweet sorghum acres so you're not taking that all
20 out. It would come out at being one of the best revenue
21 generators for the local growers.

22 The one thing that we do have in our figure
23 that they don't have in this book is the profit per
24 acre. We have a guaranteed profit for our growers. If
25 they grow the cane to our specifications and work with

1 us and do the things we ask them to do, we pay them
2 back all their costs, we give them a guaranteed rent for
3 their land and then we'll give them a guaranteed profit
4 per acre. Pretty much knocking the risk out of the
5 farmer and trying to figure out what crops that they
6 need to grow with.

7 Just a couple of quick things. In our
8 enterprise zone, we're optimistic that some of those
9 will stay in place and kind of help get the financing
10 down. Imperial County has some programs. Federal
11 government, we're not really relying on any money from
12 the USDA at this point. We applied for BCAP and missed
13 that one. We were in the Department of Energy loan
14 guarantee program and we fell out of that. Not really
15 sure if we could really count on the federal government
16 to help us at this point. We surely would hope so
17 though.

18 We're doing a project finance type project
19 strategy on this. Non-recourse financing. We're
20 working with a major energy company that is willing to
21 give us a floor price for our ethanol which will
22 guarantee the lenders and the equity that we could cover
23 principal interest and expenses of the facility. It's a
24 huge project. It's \$465 million. As mentioned before,
25 our engineering firm Uni Systems has access to the Bank

1 of Brazil, being a small to medium size manufacturing
2 company but they would finance a substantial portion of
3 the project.

4 As mentioned, this nice report that they just
5 finalized for us is the foundation for the application
6 that should be filed, hopefully, by the end of next
7 week. We've had numerous talks with a lot of
8 international banks that are interested in possibly the
9 subordinated debt on the project. We're also looking
10 for project finance equity and it's kind of a strange
11 but we're finding a lot of people that are very
12 interested in all parts of these and we don't think that
13 it's going to be too tough to get it financed. Our
14 biggest problem is going to be where we're at now.

15 We figure that it's \$16 million to get us from
16 day one, which was back in 2007, to financial close
17 which we hope will be in a year. We've raised \$6.5
18 million from friends and family as well as Fagen and Uni
19 Systems. We've incurred \$4 million worth of debt to
20 this point. Mostly salaries of the team and some
21 agricultural costs. Most of that everybody is willing
22 to take a severe slashing of that to take one for the
23 team and convert the remaining debt to equity. There's
24 still available to get about \$500,000 that we think
25 could get us from today to probably the end of the year

1 which will help the team get the Bank of Brazil
2 financing underway. Get some more engineering, get some
3 more permitting done and then we'll need about \$5
4 million to get us to financial close. The majority of
5 the money is being used for engineering, growing the
6 sugar cane and the permitting. Those are the main
7 issues. We're hopeful that AB 118 could help us with
8 some of that \$5 million and then if we get far enough
9 along some of the guys here on the equity and even the
10 subordinated debt have shown interest in maybe coming up
11 with a portion of that \$5 million that we need to get to
12 close.

13 And that's the project.

14 COMMISSIONER BOYD: Thank you. Interesting.
15 Panel is done so now questions from the folks here and
16 on the phone.

17 MS. TATE: Mr. Miller, if you're available you
18 can ask your question now.

19 MR. MILLER: This is Scott Miller from the
20 Wasted Fuels Conference which is being held Sunday,
21 Monday and Tuesday in San Diego. It's an annual event
22 and some people from the Bioenergy Producers Association
23 and various interested parties will be there.

24 I want to thank the Commissioner on his
25 wonderful work on behalf of Wasted Fuels in California.

1 I have one caveat however, there was a speaker that was
2 to come Rheta de Mesa to speak in our plenary session
3 and budget cuts precluded her from coming. I would
4 wish that in the future that California would not cut
5 the budget in your critical work on behalf of Wasted
6 Fuels.

7 COMMISSIONER BOYD: I appreciate that.

8 MR. MILLER: My second point is that there
9 seems to be a serious disconnect between the parties in
10 favor of AB 32, the low-carbon fuel standard and CARB
11 regarding supporting gasification as a conversion
12 technology relevant to production of fuels in California
13 from waste streams. I would ask that there would be
14 more continuity. There was great support on behalf of
15 AB 222 during the last session that received support
16 from the CEC, CARB and Cal Recycle. Yet, it was voted
17 down by a Committee in the senate after it passed
18 overwhelmingly in the Assembly. We can't have these
19 types of disconnects, particularly since one of the
20 people voting against the measure was the author of AB
21 32. Any comments?

22 COMMISSIONER BOYD: It's too close. The
23 capital is right across the street.

24 [LAUGHTER]

25 MR. MILLER: You're on your way out, so.

1 [LAUGHTER]

2 You're expendable.

3 COMMISSIONER BOYD: Yeah, I'm expendable.

4 Well, what can I say. Chaos in Sacramento exists and
5 it's just tough to get everybody on the same page and
6 working together. What more can I say? You ever see
7 the Governor, you can ask him about his budget. The key
8 thing is to get the California economy on its feet,
9 everybody is really grouchy, nasty, what have you right
10 now and it is admittedly tough to do that when programs
11 like we're talking about here today and things we're
12 talking about today would help do that and they too are
13 impacted but let's just say we're trying. I guess we'll
14 just keep trying.

15 MR. MILLER: No one is trying harder than you
16 and I thank you for that.

17 COMMISSIONER BOYD: Thank you.

18 MS. TATE: Are there any other questions.
19 Dwight, your line is open.

20 MR. STEVENSON: Thank you. This is Dwight
21 Stevenson with Tesoro. I apologize for the echo, I
22 don't know if that's hitting you guys or not but I'm
23 getting it.

24 The folks who are talking about the cane
25 ethanol and the sorghum ethanol grown in California

1 certainly makes a lot more sense than the expected
2 shuffling of ethanol between brazil and the U.S. that we
3 think would occur under the low-carbon fuel standard.
4 So that's certainly a good direction.

5 I've got a question about the water
6 requirements for these crops. And I'm sure that
7 everybody's aware of the California water shortage and
8 does the—do these crops use more water and effectively—
9 and what effect would they have on the growth of other
10 crops and the carbon sequestration of those other crops.
11 I'm thinking does that need to be taken into account.
12 Do you folks have any comment on that?

13 MR. RUBENSTEIN: Hi. Dave Rubenstein again,
14 California Ethanol Power. Yes. Water comes up every
15 day and actually 12:40, that's the first time today so
16 it's a late start. Thank you. We've done extensive
17 studies and the amount of water used to grow the sugar
18 cane is about the same amount of water that's currently
19 being used to grow the alfalfa, Sudan grass in the
20 Valley. The benefit is that there's a lot of water
21 that's retained in the cane during the processing and
22 we're working with numerous water companies about
23 getting that water out, cleaning it and using the water
24 to run the facility. Our current engineering estimate
25 show that we'll actually be water positive for the

1 facility and we're having some struggles because the
2 IED, they're not used to purchasing water and we're
3 actually trying to give them back some clean water and
4 we're not sure if they'll be able to take it. There's
5 opportunities there for either using it with some other
6 industries around the area because we're going to be in
7 an industrial part, it could go into the retention
8 ponds, things like that. It's a good story to tell.

9 MR. STEVENSON: Okay. So the plan itself is
10 balanced, it sounds like, that's pretty phenomenal. But
11 the water use for the cane is about the same as for the
12 alfalfa that's currently going on?

13 MR. RUBENSTEIN: Yes.

14 MR. STEVENSON: The point I'll make here is
15 that I think that that net reduction in alfalfa growth
16 needs to be considered in the carbon sequestration
17 credit that's accrued to the sugar. That's all.

18 MR. RUBENSTEIN: The cane has tremendous
19 sequestration because you put the cane in the ground and
20 you're going to get five cuttings off of that over a
21 five year period so the amount of sequestration from the
22 cane is going to be astronomical. I'm not an engineer
23 but I would think it's going to be significantly higher
24 than what the current alfalfa is doing at this point. I
25 think as far as that goes, we are hopefully, with cap

1 and trade, we might be able to see more benefit for
2 this project because of that then we're evening
3 accounting for tat this point.

4 MR. STEVENSON: That certainly should be
5 considered in the balances for the mess we call the low-
6 carbon fuel standard, the whole fuel cycle analysis.
7 Thank you.

8 COMMISSIONER BOYD: Gentleman-

9 MR. RAINEY: There's a lot of good ideas here
10 today but it seems like bottom line fermentation has
11 been around as long as agriculture And agriculture
12 burning wood has been around even longer and we're not
13 taking advantage of truly new technology and extraction
14 of oil is certainly an advancing field. It seems like
15 taking advantage of thermal chemical conversion,,
16 gasification technologies is a lot more current and
17 we've got commercially feasible capabilities available
18 to us now and that should be where most of the policy
19 should be focused. We're got, a little bit ago, a guy
20 commenting on waste to energy and it seems like the
21 thermal conversion technologies that are available today
22 can take advantage of waste streams, can take advantage
23 of purpose grown crops. There's a number of different
24 ways that technology can be applied and that out to be
25 the focus of this particular effort. Any comment on

1 that?

2 MR. RUBENSTEIN: We've looked at gasification
3 technologies on our project and we haven't really found
4 anything that is commercially viable, reliable or
5 financeable at this point. As Neil and I were talking
6 today, when the Wright Planes started flying they didn't
7 jump into a 747. We got to kind of inch our way up. I
8 think the technology that they're doing in their plants
9 is incredible. As we get ours underway we think that
10 there's a chance to even advance. We think that if
11 cellulosic becomes available, there's a chance to take
12 the excess biomass and convert that into an
13 infrastructure that's already built. You keep going
14 that route. But trying to find the holy grail or silver
15 bullet, I don't think we're going to find that and I
16 think we're got to keep the process going forward and I
17 think we'll eventually get there.

18 MR. MCKINNEY: Jim McKinney, Energy
19 Commission. Dave, I have a question for you and I want
20 to acknowledge too that you guys just missed the mark on
21 getting funding under the first round under AB 118. So
22 I'm really glad you're still out there raising financing
23 and working on your project.

24 The figure you threw out, the \$325 million
25 dollar, say expression of interest, from the Bank of

1 Brazil. Could you talk a little bit about how they
2 view advanced energy projects like yours, vis-à-vis U.S.
3 banks. It's pretty striking to me that a Brazilian bank
4 would be so interested when it's so hard to raise
5 domestic capital right now.

6 MR. RUBENSTEIN: Yeah. So it's part of their
7 Export Finance Group. What they're trying to do is
8 promote small and medium sized manufacturers to export
9 their products out of the country and get them into,
10 it's not just the United States, it's any country. Our
11 engineering group has worked with them in the past.
12 They've done a number of projects with them. I think
13 they're doing financing in Costa Rica, Venezuela and
14 maybe even Argentina right now. They're also doing a
15 sweet sorghum to ethanol facility right now in Florida.
16 The Bank of Brazil is fully behind that. I think it's a
17 \$100 million project. I think they're going to finance
18 \$90 million of it, extremely low interest rate. I think
19 it's like 1.5 percent interest rate. It's incredible.

20 The program with the bank from what we
21 understand, last year they had \$30 billion or \$35
22 billion in this fund to go out and they only put \$5
23 billion on the streets. They're looking for folks to
24 come in there.

25 I believe this year was increased to \$45

1 billion and the engineering has had preliminary
2 discussions with them and they're excited about our
3 project. A couple of things. One, they know sugar
4 cane. They know the engineering firm and the equipment
5 that they're going to be loaning against. They're also
6 excited about going to the United States because of the
7 continuing relationship they're trying to have with the
8 United State and, more importantly, they were even more
9 excited from what we've been told about the California
10 connection and the former Governor extending friendship
11 and things like that. We're getting positive feedback.

12 It's a huge amount of money. There's a lot of
13 work to be done. You see the size of these documents,
14 they're about an inch thick and I'm sure there's going
15 to be quite a bit more. Overall impression is quite
16 good and after spending the last three years in D.C.
17 talking to guys at the Department of Energy, it's kind
18 of a welcoming relief to talk to people that know that
19 they want to get a project done rather than try to find
20 walls you can get around.

21 MR. DOUGLAS: My name is Tim Douglas and I'm a
22 local Delta farmer. I have a little bit of interest in
23 an idea and it came across to me last year and I've
24 given it a lot of thought. Thank you so much for the
25 time, for the public comments, I just wanted to propose

1 is it possible to see the California Conservation Corps
2 Youth as a solution to a couple of the problems
3 mentioned as transfer of the woody materials, vineyards
4 cuttings and all the other waste stream labor needed.
5 The farm place could provide jobs to the youth and young
6 adults also contributing to the problem of youth
7 unemployment. There's always a 2-4 month wait to join
8 the CCC. Instead, they're already hard at work in very
9 bad conditions and very cheap pay and these individuals
10 are going out of their way to try to find a job that
11 they enjoy most, especially in California and how big of
12 an agriculture base we are. My generation has
13 absolutely, I think, no knowledge of farming and I think
14 that, for me, it's very disappointing. I love what I do
15 and I think people my age are really, really gung-ho
16 about farming. It's to them a mysterious concept. I
17 think that a solution could involve pushing and teaching
18 the new generation of youth into the knowledge of hands-
19 on experience of the farming industry. That's the only
20 thing I really wanted to say.

21 SECRETARY ROSS: Thanks for your comments.
22 It's Tim, right? Interestingly enough, the State Board
23 of Food and Agriculture has a meeting next Wednesday.
24 It's being hosted at the State Board Chair's Center for
25 Land Based Learning in Winters. The topic of that

1 session is the Next Generation of Farmers and Ranchers.
2 I would definitely encourage you to be there and bring
3 others with you because we want to be as creative as
4 possible to keep this excitement going. I've been
5 around the state and I know that it's real and I know
6 it's a wonderful opportunity for all of us. Thank you.

7 COMMISSIONER BOYD: I'm very intrigued by your
8 suggestion of using CCC, California Conservation Corps
9 folks, and I've made a note of it. I've never heard
10 that reference before. It may well have been thought of
11 before. Before being Energy Commissioner, I served a
12 tour of duty as the Deputy Secretary of the Resources
13 Agency and got involved with the Conservation Corps. I
14 am incredibly impressed with what they do and how they
15 do it. I think it's an excellent idea. I hope some of
16 us can inject it into dialogue at least on some of the
17 pilot programs but also involving the forest materials,
18 in particular, we're aware there's—seems to be a lot of
19 concerns there about the labor costs associated with
20 getting materials. So, good idea. We'll pursue it.

21 DR. HUMISTON: Just a quick comment. Several
22 of the last speakers have expressed concern about the
23 possibility of not having access to USDA loan guarantees
24 in the future. I'm pleased to report that is the one
25 area of our budget that not only is not looking at any

1 cuts, quite the contrary. Year before last we
2 converted our single family home loan guarantee program
3 to be budget neutral with zero subsidy so it doesn't
4 require appropriations from Congress. That program,
5 almost overnight, went from \$3 billion a year to \$24
6 billion a year. I literally have no end in funding
7 available for loan guarantees for single family home
8 loans. We're in the final stages of doing exactly the
9 same thing to our Business and Industry Loan Guarantee
10 program right now. Hopefully we're have that completed.
11 It's with the Office of Management and Budget. We hope
12 to have that completed very soon. And that literally
13 means that there will not be a limit on availability of
14 Business and Industry Loan Guarantees once that's
15 completed. We could easily go up to \$24 billion a year
16 for that.

17 MR. MAYUGA: I want to elaborate more on what
18 I talked about earlier about the Siemens project here in
19 California. Gasification, as this young gentleman
20 indicated—one of the benefits of gasification, at least
21 with our process, is that it is a closed loop system.
22 The only emission is steam, roughly about 225 pounds,
23 160 million tons of steam annually. We also will be
24 producing potash, nitrogen, and sulfur. But more
25 importantly, this is what got a lot of the guys down at

1 Cal Poly Pomona, was liquid CO2 for growing in hot
2 houses. Our plan is to bring approximately 500 acres of
3 hot houses to the County of Colusa and the City of
4 Colusa, utilizing some of that liquid CO2 as a growing
5 amendment.

6 The potash that we'll be producing will be for
7 sale or it could even be a trade out for the feedstock
8 growers. There's a lot to be said for gasification. We
9 are self contained. We have our own wastewater
10 treatment plant. We even produce our own electricity
11 from the syngas, methane syngas. We'll be producing
12 about one megawatt at our plant to run our four units.

13 So gasification has a lot of positive things
14 attributed to it. We're looking at four specific
15 regions, (inaudible) area, the Colusa/Sacramento Valley
16 area, the Imperial Valley and possibly the area around
17 Monterey and Salinas as possible feedstocks to begin
18 with, areas.

19 But gasification and Siemens has looked at and
20 I've been to Germany and looked at a lot of the
21 processing that they're doing there. A lot of the
22 little towns in France and Germany, parts of
23 Switzerland, have their own little digesters producing
24 their own electricity. Switzerland is 100 percent
25 recyclable. You won't find a landfill in Switzerland.

1 They figured out a way to take all their waste and
2 utilize which is pretty amazing.

3 So the gentleman from Harris Ranch, I have to
4 get with you. I need your poo.

5 [LAUGHTER]

6 What I really want is the bark beetle trees.
7 Anybody have bark beetle trees? That's really great
8 feedstock for us. You don't know about bark beetles?
9 Well, all the pine trees that have been rendered useless
10 by bark beetles.

11 SECRETARY ROSS: Is that it? Any other
12 comments or questions?

13 MR. JENNER: Sorry, I just had to pipe in.
14 Mark Jenner from the California Biomass Collaborative.
15 I think that—I would just encourage everyone to be
16 careful about business plans that involve zero cost
17 feedstocks. I think we're in a time when we can't grow
18 enough plant material. We are continuing to find new
19 ways to use the plant material that has already been
20 created so industries that have been dependent on very
21 low cost residuals, residues, are now squirming because
22 those prices are going up. That's the trend. You may
23 find a feedstock that has little value today but in five
24 years it may have significant value. I've seen a lot of
25 projects, even with manure, that farmers are paying to

1 get rid of their manure but if there's a fear that
2 someone is going to make money on it, they won't enter
3 into a contract of any kind. That's the reality. If
4 we're going to get to somewhere, we're having a
5 bioeconomy—it's that everybody is going to get paid.

6 SECRETARY ROSS: I'm sure the farmers applaud
7 that. Thank you all very much. Commissioner Boyd,
8 please give us your final words of wisdom.

9 COMMISSIONER BOYD: I just want to join you in
10 thank everybody and I think you and I and our staffs
11 need to talk about what we're going to do next with what
12 we've heard today and how to apply it to what we're
13 doing and how to revise maybe some of the approaches
14 we're taking in existing programs or how to provide more
15 openings for more folks. Or just how to encourage more
16 people to get involved. We are still blessed with the
17 AB 118 program and most of its revenue. The revenue
18 falls off with the economy but they haven't swept the
19 money from us. We're still in a position to try to help
20 folks. As you and I talked earlier this week. It seems
21 to us who are unfortunately so office-bound, duty-bound
22 mainly because they won't let us travel anywhere, we do
23 need to reach out more and we need more reach out, more
24 education, more getting everybody to work together on
25 this. I hope in the not so distant future we can push

1 more of that and do more of that.

2 I think we've got more people talking together
3 and I think we just need to do more of that. For
4 several years, I chaired the bioenergy, interagency
5 working group in the state that's done some of the
6 plans. But we've been talking about the need to modify
7 that group to start opening it up to a larger
8 stakeholder group of outside folks. You can do plans
9 and provide a lot of rhetoric and try to give people
10 some political goals to talk about. We've done about
11 all of that we can. The good news is, as you and I
12 know, this Governor has embraced the concept of the plan
13 and his office has given us charges to update the plan
14 and have it reflect the policies of the current
15 administration and go out there and do more. I think
16 it's time to get more stakeholders involved in that. We
17 can talk about how to do that.

18 The AB 118 program has an Advisory Committee
19 like all Advisory Committees started out kind of rough
20 but after a couple of years, there's a great deal of
21 knowledge and trust that exists between all the players.
22 And we probably need to do more things like that to push
23 these ideas and to push this more into developing this
24 economy in California, doing more for Californians and
25 providing additional business opportunities for many and

1 perhaps revenue streams for California agriculture
2 which is a backbone industry of this state.

3 It's been fun. So thank you.

4 SECRETARY ROSS: Thank you.

5 [Meeting is adjourned at 1:01 p.m.]

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