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Bioenergy Interagency Working Group
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Subject: Comments of the Center for Energy Efficiency and Renewable Technologies (CEERT) on the Draft Consultant's Report: "Recommendations for a Bioenergy Action Plan for California." (CEC-600-2006-004-D) Prepared for the Bioenergy Interagency Working Group by Navigant Consulting.

CEERT thanks the Bioenergy Interagency Working Group for the opportunity to comment on the Draft Bioenergy Action Plan.

CEERT commends the efforts of the authors from Navigant Consulting on the draft report that they have prepared on behalf of the Bioenergy Interagency Working Group regarding the steps California might take to increase its use of biomass and thereby reduce its dependence on imported electrical power and fuels. Given the short time that they were allowed, and the challenging issues to be addressed, they have done an admirable job in pulling together this report.

While CEERT supports, in principle, the goals as set forth in the Draft Bioenergy Action Plan and developed through the efforts of the Bioenergy Interagency Working Group (BIWG), we do have some concerns that we would like to share regarding the exploitation of biomass for energy, fuels, and products (including chemicals, etc.).

In this written submission we make general remarks on the Draft Bioenergy Action Plan, and then we comment on some of the public testimony and presentations made at the March 9th workshop. We also make four explicit recommendations within these comments.

While we perceive that there are environmental and technical challenges facing agriculture, forestry, and the use of Municipal Solid Waste that we would like to see more fully addressed in the Draft Bioenergy Action Plan, we will refrain from commenting on these at this time. Some of these concerns have already been addressed by other commentators. Some of our other concerns regarding the challenges facing the extensive routine use of biodiesel for the state's broader diesel fleet have also been addressed by other commentators.

CEERT COMMENTS
Proposed Bioenergy Action Plan for California
Docket No. 06-BAP-1
Center for Energy Efficiency and Renewable Technologies

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GENERAL REMARKS

In an ideal world the use of biomass for energy, fuels, and products should be designed as a closed loop — with respect to the cycling of energy, nutrients, and minerals, etc. — that minimizes emissions to air and water. As such, the use of biomass in this fashion should form a regenerative industrial cycle which conforms to what we would take to be Mr. Desmond's "virtuous cycle"¹. This should not only minimize environmental impacts it should ideally help to improve both environmental quality and public health. This could conceivably be the case if all of the inputs and outputs are acknowledged, as a biomass industry becomes more industrialized and expands in the state.

However, this is not a simple task under the best of circumstances with even the simplest of industrial cycles. While acknowledging this fact, the design and implementation of a statewide biomass-based industry also faces the considerable challenge of having to intensively exploit and manage dynamic biological systems² while still meeting the state's other challenges of: population growth; competing land use; other competing and expanding resource demands (especially for water); improving air and water quality; reducing carbon emissions, etc. — all while helping to minimize the impacts of current agricultural and forest industry practices.

We would caution that while it is generally expected that there will be environmental benefits accrued from the pursuit of a biomass-based/bioenergy industry — and while there has been some research examining this issue for the industry — the full extent of these benefits still needs to be quantified.³ Indeed the development of inappropriate approaches could lead to disbenefits. In order to assure that the proper approaches are pursued, we recommend that:

CEERT Recommendation #1

Appropriate socioeconomic analyses should be undertaken (whether this be analysis done through the use of life cycle, computable general equilibrium, or other appropriate modeling) to help identify and prioritize development pathways for the industry that should minimize environmental and public health impacts and maximize environmental and public health benefits.

1 Remarks made by CEC Chairman, Joseph Desmond, at the BIWG public workshop, March 9th, 2006.

2 Here we are talking about that part of the biomass industry that is not dealing with wastewater treatment or municipal solid waste.

3 This is also acknowledged in the Draft Bioenergy Action Plan, "...the state currently lacks a comprehensive system for assessing the overall environmental and health benefits and costs (on a life-cycle basis) of bioenergy options." p.27

CEERT recognizes the many challenges that a developing biomass-based/bioenergy industry faces, especially when it comes to protecting the environment, and we are therefore very appreciative and strongly endorse the language contained within the report that acknowledges that:

"...California should not lower its environmental standards..." p.25

California should not sacrifice "...other state mandates, such as environmental protection." p.35

"The siting of bioenergy facilities is an important issue for low-income and minority communities which may have to bear a disproportionate share of the emissions or discharges located in their communities. As a result, the environmental impacts of converting biomass into energy..."
"...need to be considered, evaluated, and mitigated." p.25

The state should, "... evaluate and mitigate the environmental and health effects on the affected local communities of proposed facilities that produce or use bioenergy. In addition, environmental justice concerns should be included in any public awareness campaign that results from implementation of this proposed Action Plan." p. 25&26

CEERT also whole-heartedly endorses the sentiments as expressed by several of the participants at the March 9th, 2006 Public Workshop, that there should be "no backsliding" on environmental protection as the state moves forward in developing its biomass-based/bioenergy industry.

We are aware that California's regulatory regime can sometimes be daunting to those seeking to do business and develop facilities in the state, and we are sympathetic to the recommendations as set forth in the Draft Bioenergy Action Plan that the state:

"...develop an integrated and coordinated plan to create a favorable regulatory environment for bioenergy development, while maintaining the required oversight of the existing utility, transportation fuel, and waste management industries." p.3 & 35

"...clarify and/or change inconsistent rules, regulations and procedures that may be hindering bioenergy development." p.35

CEERT can support these recommendations as long as the resulting streamlining/rationalization of the regulatory regime preserves — or better yet, contributes to improvements in — the health of Californians and their environment.

The Issue of Setting Mandates

As noted throughout the Draft Bioenergy Action Plan, California represents a large market for transportation fuels. This suggests that any actions the state takes to set mandates for the consumption of fuels and fuel blendstocks that are shared in common with the rest of the continent could have significant implications for the entire continental market. For this reason, we recommend that:

CEERT Recommendation #2

The state should employ appropriate modeling approaches in order to investigate the implications of setting mandates and anticipate the larger market impacts that could result.

Such modeling would best be done before the establishment of any biofuels mandates.

The modeling work could help to investigate whether facility and infrastructure development (ie the supply chain), both within and without the state, could keep pace with prescribed timelines as set out in state mandates, what the implications would be for the price of fuel and fuel blendstocks,⁴ and how this might interlink with international markets. It could also provide insights into how the activities of an active continental biofuels market could lead to alterations in the energy and GHG gas balance⁵ of the fuel/blendstocks depending upon how the biofuels were sourced, delivered, and/or diverted in response to shifting market demands.

Finally, these types of investigations could also inform the state on whether or not it would have sufficient vehicle fleets to absorb these new fuels and fuel blends and what the implications would be for protecting air quality, etc, if there was an inability of the transportation system to make full use of these mandated supplies. The corollary to this is that such insights would also inform the state on how it should best go about building a biofuels (and ARB) compatible transportation fleet that could absorb the mandated fuel while protecting the environment. Indeed, California was very much in danger of running afoul in this very manner if the approval of the 2005 Federal Energy Policy Act had not contained the trading and credit scheme for ethanol under the Federal RFS.

The Draft Bioenergy Action Plan contains the following recommendation (in brief and extended form):

"Direct the California Air Resources Board to develop regulations that maximize the flexibility of using biofuels, while preserving the environmental benefits of their use. This effort should build upon the Rulemaking to Update the Predictive Model and Specifications for Reformulated Gasoline proceeding that has recently been initiated." p.4

" Direct the Air Resources Board to develop regulations that maximize the flexibility of using biofuels, while concurrently preserving or enhancing the environmental benefits of their use. The effort should build upon the Rulemaking to Update the Predictive Model and Specifications for Reformulated Gasoline proceeding that has recently been initiated, and could include:

- 1) Proposing minimum annual statewide ethanol consumption levels to encourage in-state production opportunities until details of the proposed state RFS are developed.

4 For a current example of what we mean See: Financial Times (US edition), March 16th, 2006. p.4 print edition. *US drivers face higher prices for new fuel.* By Carola Hoyos and Kevin Morrison. Copy of text attached.

5 We comment on this further below, in response to some of the public comments made during the March 9th workshop.

2) Conducting a comprehensive and peer-reviewed study of the costs, emissions impacts, and fuel supply consequences of low-level ethanol blends (i.e. E6 to E10), and incorporate the study findings into the rulemaking process.

3) Addressing the emissions performance, fuel supply consequences and cost issues surrounding greater use of E85 in California.

4) Establishing necessary fuel specifications for transportation biofuels used in blends and as neat fuels, including low-ethanol blends with gasoline, E85, E-diesel, FT diesel, B5, B20, B100, and biomethane."

p. 38

To the best of our knowledge the Air Resources Board already does everything that it can to allow for the use of alternative transportation fuels in the state, while adhering to its legally required mandate of protecting and improving California's air quality. Not only that, its demonstrated willingness to include stakeholder involvement means that it has one of the most open and transparent consultative processes in state government when evaluating the use of any new fuels.

In the near term we are not sure how proposing minimum statewide ethanol consumption — in excess of the 900 million gallons per year already used — would significantly shift the market in a way that would be any more advantageous to California-based industry in the face of national market developments. As pointed out in the Draft Bioenergy Action Plan, state industry currently produces roughly 35 million gallons of ethanol, and one workshop commentator noted that there may be as much as 50-55 million gallons produced in the state. On this basis, and with the completion of Pacific Ethanol's facility in Madera in the next year, in state production could soon total as much 85-90 million gallons. If the cost advantages that currently exist for in-state ethanol production do not already allow in-state producers to take advantage of a 900 million gallon a year market, it is not clear how prematurely raising this consumption level (in the context of the comments we have provided above) would help state industry in the face of an aggressively expanding industry in the mid-west and elsewhere. In addition, 900 million gallons of ethanol is near the maximum that the state can consume while limiting ethanol use to the cooler months of the year (wintertime oxygenate period) and minimizing air quality impacts. Increasing the amount of ethanol consumed in the state would be in conflict with protection of the state's air quality and public health, if it exceeded what the state's transportation fleet already consumes. The modeling work that we recommend be done (above) should help to understand the implications of this issue.

Also, to the best of our knowledge, the Air Resources Board's work on fuels is already peer-reviewed by some of the world's leading independent experts on atmospheric chemistry and transportation fuels, etc. in the University of California system. "(C)osts, emissions impacts, and fuel supply consequences," are also already a part of these types of analyses. The ARB already incorporates these "study findings into the rulemaking process."

We agree that more work needs to be done on “the emissions performance, fuel supply consequences and cost issues surrounding greater use of E85”, and that more work needs to be done to establish “necessary fuel specifications for transportation biofuels used in blends and as neat fuels, including...” “...E85, E-diesel, FT diesel, B5, B20, B100, and biomethane.” For the time being, the path forward on low-blends of ethanol may require a more comprehensive effort than for the other biofuels and biofuel blends.

Response to the presentations of Misters Tom Koehler (representing the California Renewable Fuels Partnership) and John Boesel (representing Calstart), to the March 9th, 2006, Bioenergy Interagency Working Group public workshop.

Chief amongst all of the bio-energy sources being considered throughout the world is the pursuit of the increased use of ethanol to displace petroleum-derived transportation fuel. For at least a decade there has been a debate in the state over the impacts that the use of low blends of ethanol (research has examined blends up to 10% ethanol) could have on the state’s air quality. This debate is no less intense today.

Research by the California Air Resources Board, CE-CERT at UC-Riverside, the Coordinating Research Council, Toyota, and others have long indicated that the use of low-blend ethanol could lead to increases in the inventories of VOCs released into California’s airsheds with a consequent increase in ozone and smog.

As part of their public comments in front of those gathered at the March 9th Workshop, Misters Tom Koehler and John Boesel each independently presented a slide containing the same graph which displayed a line representing the projected decline in the emissions of VOCs from California’s light-duty vehicle fleet in the coming years. They used this slide as the basis with which to argue that the increased use of low-blends of ethanol should be of little concern for air quality in the state. We are concerned about the impression that the use of this graph may have made with the large audience in attendance at the public workshop.

To the best of our ability to discover the origins of this slide in the short time that we have had to prepare these comments⁶ our understanding is that this slide is based on EMFAC data showing how total vehicle emissions would decline as older vehicles are replaced by newer vehicles in California’s light-duty fleet in the coming years. These data represent the decline in emissions from California reformulated gasoline in the absence of ethanol as an oxygenate. EMFAC modeled data represent just one component of the data that are incorporated in the Air Resources Board’s Predictive Model.

The EMFAC data are also an important component for the development of State Implementation Plans by the state’s air districts and required under the Federal Clean Air Act. [We should not need to remind everyone, but we note it here, that while many of the state’s air districts are making Herculean efforts they are constantly challenged to keep ozone levels down, and some are still in violation of the NAAQS for ozone.] Besides the line on the graph indicating the

⁶ Unfortunately, at the time of this writing on the evening of March 16th the presentations of Misters Koehler and Boesel, do not appear to be posted on the relevant docket page of the CEC website, and so we cannot be more specific as to the details of the slide included in their presentations.

decline in emissions based on the EMFAC data, the graph displayed by Misters Koehler and Boesel also showed a second line above that for the EMFAC data and indicating how they expected ethanol to increase the emissions of VOCs from the fleet. The increased emissions, relative to the EMFAC baseline, were also projected to decline over time. Our understanding is that any emissions allowed to occur above that in the EMFAC data set is in violation of the backsliding provision in SB989 (Sher 1999)⁷, and would thus be in violation of California law. In addition any sanctioning of increased emissions resulting from the use of ethanol in California reformulated gasoline would compromise air quality and contribute to the most challenged of the state's air districts being in violation of NAAQS and the Federal CAA. We therefore recommend:

CEERT Recommendation #3

That the BIWG clarify, with the relevant ARB staff the meaning and implication of the information as contained in the graph presented by Misters Koehler and Boesel to the March 9th workshop, so that they may clarify its meaning to those in attendance and if necessary to the general public.

One final note on the ethanol permeation issue. While many people have focused on the issue of permeation and evaporative losses from light-duty motor vehicles, this is not the only pool for the use of California reformulated gasoline. In its "Draft Staff Report on the Effects of Ethanol in Gasoline on Emissions"⁸ the ARB examined the impacts from other sources of emissions in the state. CARB also analyzed what would happen to emissions from off-road equipment (including lawnmowers, blowers, chainsaws, and other lawn and garden equipment, but excluding portable engines, off-road vehicles and watercraft) with 6% ethanol,⁹ and from high-density polyethylene (HDPE) containers using 5.25% ethanol.¹⁰ Evaporative emissions due to permeation would increase by about 49% from the off-road engines examined, and by more than 60% from untreated HDPE containers. Together the statewide emissions from these two source-classes would total an additional 15 tons per day (10 and 5 tons respectively).

Thus, overall statewide emissions resulting from permeation from the source-classes measured by the ARB would total 60 tons on a typical ozone day. The predictive model indicated that emissions would increase by 60% on a high ozone day. This indicates that the total permeation emissions from the source-classes measured by the ARB could reach as high as 100 tons per day on a high ozone day.

7 43013.1.

(b) The state board shall ensure that regulations for California Phase 3 Reformulated Gasoline (CaRFG3) adopted pursuant to Executive Order D-5-99 meet all of the following conditions:

(1) Maintain or improve upon emissions and air quality benefits achieved by California Phase 2 Reformulated Gasoline in California as of January 1, 1999, including emission reductions for all pollutants, including precursors, identified in the State Implementation Plan for ozone, and emission reductions in potency-weighted air toxics compounds.

8 Available at: <http://arb.ca.gov/fuels/gasoline/permeation/permeation.htm>

9 Available at: <http://www.arb.ca.gov/msprog/offroad/oreft/evapemissions062201.pdf>

10 Available at: <http://www.arb.ca.gov/msprog/offroad/oreft/permeation0501.pdf>

There are still other sources for which there are currently no emissions data.

To put the significance of the emissions associated with the use of ethanol in to context,¹¹ if the ethanol that is currently used in the SCAQMD were to be removed from reformulated gasoline, by 2010 this would have the equivalent effect of:

- (1) removing 1.3 million cars from the roads, or
- (2) avoiding the emissions produced by 20 new California power plants, or
- (3) avoiding the emissions produced by the equivalent of 17 of California's oil refineries

Response to the green house gas balance numbers presented by Mr. Koehler

Mr. Koehler also presented some green house gas (GHG) balance numbers during his comments. He displayed numbers indicating that if the state were to use a 6% blend of ethanol year-round, there would be reductions of 3.5 million tons in GHGs, and if the state were to use 10% ethanol blends year-round there would be 6 million tons in GHG reductions. Although we cannot identify where Mr. Koehler's numbers come from, we would like to point out that the modeling of GHG-balances from the production and use of corn-based ethanol have a large range of uncertainties. These uncertainties are large enough — in holding to the precautionary principal — to recommend that the GHG balance of ethanol should be viewed as being neutral. We understand that some recent and soon to be published peer-reviewed research indicates that the bounds in the range of uncertainty could be as much as twice the magnitude of the possible gain in GHG displacement.

Response to one point made by Mr Richard Germain

During his presentation at the March 9th workshop and within the context of discussions on the use of low blend ethanol, Mr. Germain stated that the fleet turnover issues are “transitory”. We have a differing perspective on this issue. Because of air quality concerns, the rate of fleet turnover is viewed to be a significant impediment to the adoption of low-blends of ethanol, and we understand that this is a major source of concern to the ethanol industry and its proponents. The latest EMFAC analyses indicate¹² that the rate of turnover will be an issue for quite some time. In addition, recent analyses of nation-wide trends indicates that the rate of fleet turnover has been slowing, because of the overall higher quality of the vehicles that are still on the road. We do not agree that the fleet issue is “transitory”.

11 We are hopeful that as more research is conducted — like that described in the CRC's recently released E-67 study — that ethanol can find its place in providing the state with greater fuel flexibility in a way that still protects air quality. The CRC study “Exhaust Emissions from Ethanol/Gasoline-Blend Fueled Vehicles” is available at: <http://www.crao.com/Annual%20Report/2005%20Annual%20Report/emission/e67.htm>

12 Available at: <http://www.arb.ca.gov/fuels/gasoline/meeting/2005/110305emissbrkdn.pdf>
PRNewswire, February 14, 2006. R. L. Polk & Co. Reports U.S. Motor Vehicle Longevity Increases in 2005
<http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/02-14-2006/0004282138&EDATE=>

CEERT Recommendation #4

That in pursuing its petroleum demand reduction goals, and until such time as technical solutions can be developed to allow for the use of low-blends of ethanol in the state's reformulated gasoline, the State of California implement a strategy capitalizing on the use of E85 and FFVs, and in such a manner that as the strategy is rolled out, air quality is also protected and improved.

CONCLUDING REMARKS

CEERT has long been advocating that the state pursue a path of greater energy efficiency first, and a greater use of renewable energy second. The goal of reducing the state's petroleum demand has also been a part of CEERT's mission. We recognize that the responsible (ie environmentally and health protective) deployment of biofuels and biofuel blends can play an important role in meeting this goal as part of a diversified alternative fuels strategy. Biofuels can play their part in helping California to build the *Onramp to the Hydrogen Highway*.¹³

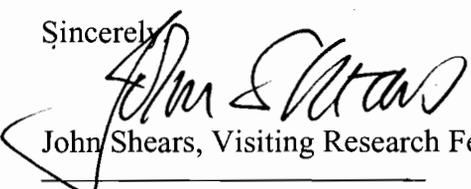
We believe that the state and industry should pursue a thoughtful and considerate approach to a biofuels/bioenergy/biomass industry strategy that looks to California's world-leading environmental standards as a *goal to be achieved, not as a hurdle to be avoided*. Meeting this challenge will place many of California's innovators in a position to capitalize on developing market opportunities in other areas of the nation, and the world. These areas too are — or soon will be — facing similar challenges of: population growth; competing land use; other competing and expanding resource demands; improving air and water quality; and reducing carbon emissions. Such has been the case in the past for California's many innovators, and we believe such can continue to be the future.

In pursuing its overall strategy for a biofuels/bioenergy/biomass industry we believe that California should seek to capitalize on its biomass resources in a manner that provides the greatest potential for innovation, community and economic development, while improving the state's energy security, environment, public health, and fostering its biodiversity.

We look forward to working with all stakeholders in moving forward in developing and implementing a Bioenergy Action Plan for the state.

We thank you for the opportunity to submit comments on the proposed Bioenergy Action Plan for California.

Sincerely,


John Shears, Visiting Research Fellow

¹³ CEERT has been referring to the alternative fuels strategy, including what it considers to be the appropriate use of biofuels (as with all alternative fuels), as the "Onramp to the Hydrogen Highway" before the beginning of the Blueprint process.

Financial Times (London, England)

March 16, 2006 Thursday

US drivers face higher prices for new petrol

By CAROLA HOYOS and KEVIN MORRISON

US drivers could face a shortage of petrol and significantly higher prices at the pumps because of problems phasing in environmentally friendlier petrol this spring.

The US Department of Energy issued the warning as industry executives and analysts are forecasting that prices at petrol pumps could rise as much as 30 per cent to Dollars 3 (Euros 2.5, Pounds 1.7) a gallon - close to the records achieved after Hurricane Katrina devastated the Gulf coast last summer.

The US gasoline futures contract that corresponds to the new fuel - a mix of reformulated petrol with corn-based ethanol - is also rising, further underlining concerns.

"Average retail prices in the US could move up into the Dollars 2.80-Dollars 3.05 area. Our analysis overtly assumes (perhaps heroically) that there are no major refinery outages/interruptions," Mike Rothman, analyst at International Strategy and Investment, said in a recent report.

Wholesale US gasoline prices have risen by a third in the past month to about Dollars 1.80 a gallon, in part on concerns about a potential squeeze on petrol supplies because of the changes.

The shift from methyl tertiary butyl ether (MTBE) to the ethanol mix next month will also coincide with a seasonal pick-up in demand for petrol as the summer driving season starts.

"We are introducing these new rules when demand is high and it looks like supply is going to be low, therefore putting a squeeze on supplies and prices," said Philip Verleger, an energy economist and senior fellow with the Institute for International Economics.

Several US states have now banned the use of MTBE and the 2005 energy bill specifies that companies are liable for ground contamination caused by the additive. Refiners had little choice but to drop MTBE but the ethanol mix is posing serious logistics challenges.

A potential bottleneck is the transport and storage of ethanol-blended petrol. Because of contamination concerns, terminals will have to handle the petrol and ethanol separately, which they will not be able to do without further investments, said the Energy Information Administration.

With the east coast needing to increase by 2.5 times the amount of ethanol it receives, rail tankers and barges may not be available, the agency said. Texas is likely to face similar problems.

The EIA has also raised concerns about the availability of ethanol. "Ethanol capacity in the US is running at near-capacity and therefore is not adequate to replace the MTBE lost at this time," it said recently.

Michael Burdette, senior analyst at the EIA, said the new rules would create 129,000 b/d of additional demand for ethanol, surpassing existing US capacity of 282,000 b/d - which meets current demand. However, the EIA expected the additional demand to be met by the installed new capacity by the end of the year.

The US's vast petrol inventories are only of limited use because 90 per cent of the stockpile is conventional petrol, which cannot be blended with ethanol and is therefore useless in making up any shortage.

The most recent significant price rise caused by new petrol rules came in 2000. Mr Burdette said the new rules would create 129,000 b/d of extra demand for ethanol.

LOAD-DATE: March 15, 2006