

**Minutes of the Fifth Low Carbon Fuel Standard Expert Workgroup  
Sacramento, California  
August 17, 2010**

The fifth meeting of the Low Carbon Fuel Standard Expert Workgroup was held at the California Environmental Protection Agency headquarters on August 17, 2010. Robert D. Fletcher, Deputy Executive Officer California Air Resources Board (ARB), chaired the meeting.

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The link to the Meeting Notice and Agenda is:

[http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/071510lcfs\\_ewg\\_mtg\\_agd.pdf](http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/071510lcfs_ewg_mtg_agd.pdf)

The Expert Workgroup Members List is available on the webpage:

[http://www.arb.ca.gov/fuels/lcfs/members\\_list.pdf](http://www.arb.ca.gov/fuels/lcfs/members_list.pdf).

The Sub-Workgroup Membership List is available on the webpage:

<http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/LCFS-EWG-Subgr-Membership-List.pdf>

All presentations and supporting documents for this meeting and previous Expert Workgroup (EWG) meetings are posted at:

<http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/expertworkgroup.htm>

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**Agenda**

The items covered on the agenda included: Introductions, announcements, and presentations by Land Cover Types, Carbon Emission Factors, and Co-Product Credits subgroups. The minutes from the June 17, 2010, were presented for approval. Stepen Kaffka made a motion to approve, Don O'Conner seconded and the voting was unanimous. Minutes for the July 15, 2010, EWG meeting will be presented for approval at the next meeting.

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## **Introductions**

Attending the August 17, 2010, meeting were: Robert D. Fletcher (Chair), James Duffy (Co-chair), Holly Gibbs, Phil Heirigs, Stephen Kaffka, Keith Kline, Jesper Kløverpris (remote), Robert Larson (remote), Michelle Manion, Jeremy Martin (remote), Seth Meyer (remote), Steffen Mueller, Richard Nelson, Don O'Connor, Michael O'Hare, John Sheehan, Mark Stowers, Wally Tyner (remote), Paul Wuebben, and Sonia Yeh.

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## **Opening Comments from the Chair, Robert D. Fletcher:**

There has been a lot of discussion about ARB actions relative to how we deal with the values presented in the most recent Purdue work. Specific assignments have been handed out to specific subgroups regarding the Purdue analysis for comment and recommendations of priorities. Based on the recommendations, ARB can work on additional analysis as necessary. ARB has also asked two subcontractors to give an analysis of the Purdue work and they will be presenting in September.

ARB is planning on going to the Board in November with an initial report and will follow-up with regulatory amendment recommendations in the spring. This assumes that staff are available to perform the work. For the subgroup final reports, ARB would like short term and long recommendations. Our report to the Board in November is not a regulatory hearing, but a report. 2011 is going to be the first compliance year for the Low Carbon Fuel Standard and we want to get the system up and running.

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## **Land Cover Types Subgroup: Presentations by Holly Gibbs, and John Sheehan**

***As a wrap-up to the discussion, the following were identified as action items for the Land Cover Types Subgroup:***

1. Continue investigating inaccessible lands issue/available land pools in *Global Trade Analysis Project (GTAP)* (John)
2. More work on the worldwide land available/appropriate for biofuel expansion (John)
3. Summarize land conversion datasets for the United States (Richard)
4. More analysis of Winrock results (Holly)

5. Follow up with GTAP on potential to use Gibbs et al to update CET function used to estimate land sources (Holly)
  6. Investigate non-economic factors for Land Use Change (John)
  7. Continue assessment of degraded lands (Richard)
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### **Review of ETA Calculations by David Lobell – Summary of Key Points**

David Lobell, PhD, of Stanford University, spoke remotely and offered the following points regarding the Purdue Work:

1. Reading the draft, it is a very impressive effort and I will comment only on the use of Terrestrial Ecosystem Model (TEM) to estimate yields for new lands. I do this without knowing how sensitive the overall results are to these numbers, and so how much time it is worth for them to focus on these.
2. TEM is a widely used and respected model. Like any model it is not perfect and relies on the quality of input data. One especially hard piece of data for modeling unused lands relates to soil properties, so it would be nice to know how sensitive results are to soil assumptions
3. It is likely that non-used lands that have high net primary production (NPP) are not in use because of other biophysical or economic constraints (e.g., accessibility). I would suspect these issues are strongest for the areas with higher NPP compared to unused lands with lower NPP. It therefore may not make sense to use the median productivity of non-used lands as they propose.
4. The first two points are simply reasons why their numbers might be wrong. What would help to convince me is to show that TEM is doing a good job of estimating NPP for areas where we have independent estimates of NPP (i.e. in the cropped areas within each country). Do the cross-country patterns in productivity from TEM match what is in the GTAP database? This is a test they could do with the current results.
5. I didn't see any clear explanation of why they think the numbers are higher than previous expert estimates. They mention that it may have to do with Agro Ecological Zone (AEZ) weights but they didn't do any calculations to support this. Are the unused lands just in much worse AEZ's, so the average yields are still lower than average existing yields? It is a pretty large difference from the prior and so some thought as to why the prior would have been wrong seems warranted.

6. Finally, to address the second point above, it might be reasonable to look only at NPP for abandoned agricultural lands since presumably these could be the most likely to come back into production. A previous study I was involved in did just that, comparing NPP on existing vs abandoned cropland. We found the global average NPP was 3.2tC/ha/yr on abandoned and 4.7 on existing cropland, or a ratio of 0.68. For more detail see C. B. Field, J. E. Campbell, D. B. Lobell, Trends in Ecology & Evolution 23, 65 (2008).

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**Carbon Emission Factors Subgroup: Presentations by Sonia Yeh, Don O'Connor, Susan Sanchez, Steffen Mueller, and Richard Plevin**

***As a wrap-up to the discussion, the following were identified as action items for the Carbon Emission Factors Subgroup:***

1. Evaluate spatially explicit databases, such as the Winrock databases for the U.S. Environmental Protection Agency new Renewable Fuels Standard analysis, as a basis for estimating biomass C stock and soil carbon by AEZ.
2. Look at additional fertilizer use as yield increases, emission profiles such as fire emissions, and black carbon.
3. Where is the disposition of forest biomass to various carbon pools? Pay closer attention to harvesting wood products.

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**Co-Products Credits Subgroup: Presentations by Phil Heirigs, Stephen Kaffka, Don O'Connor, and Mark Stowers**

***As a wrap-up to the discussion, the following were identified as action items for the Co-Products Credits Subgroup:***

1. Hold one more meeting with feed experts; continue discussion of displacement ratios.
2. Continue assessment/comparison of co-products treatment in GREET and GTAP.
3. Continue with Task 1 comparison of co-product treatment across fuel pathways and researchers.
4. Continue discussion of attributional vs. consequential life cycle assessment.

5. Recommendation to run new version of GTAP with fixes and updates to re-assess Indirect Land Use Change associated with soy biodiesel and renewable diesel (i.e., address the negative crush margins inferred from previous results).
  6. Develop recommendations for survey type work (e.g., through industry associations such as the National Grain and Feed Association).
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### **Review of recent Purdue modeling – subgroup assignments**

Specific subgroups have been asked to evaluate each of the model updates described below and give their recommendation on the appropriateness of the update, the basis for their recommendation, and alternatives or suggestions for improving the update.

1. Cropland pasture in the United States and Brazil and Conservation Reserve Program lands have been added to the model. **Land Cover Types**
2. The method of treating the productivity of newly converted cropland has been changed so that it is now based on the ratio of net primary productivity of new cropland to existing cropland in each region and AEZ as estimated by the Terrestrial Ecosystem Model. **Land Cover Types and Elasticity Values**
3. Corn yield response to higher corn prices has been estimated econometrically and included in the model. **Elasticity Values**
4. The energy sector demand and supply elasticities have been re-estimated and calibrated to the 2006 reality. Current demand responses are more inelastic than previously thought. **Elasticity Values**
5. The nesting structure of the livestock sector has been modified to better reflect the functioning of this important sector. **Elasticity Values**
6. The treatment of production, consumption, and trade of *Dried Distillers Grains with Solubles* has been updated. **Co-Product Credits**
7. Emission factors – methodology of converting Woods Hole data set to regional emission factors for forest and pasture conversion and more specifically the assumption that 25 percent of above ground forest carbon is not released to the atmosphere. **Emission Factors**
8. Group 2 simulation methodology – experimentally updating the baseline from 2001 to 2006. **Comparative and Alternative Modeling Approaches**

9. Group 3 simulation methodology – accounting for dynamic changes in population and crop yield growth over the time period from 2006 to 2015. **Comparative and Alternative Modeling Approaches**
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### **Future meeting dates and topics**

**September 9:** Opportunity for individual subgroups to meet– James Duffy will be coordinating with chairs and will arrange meeting rooms.

**September 10:**

1. ARB will host a presentation of an analysis of the Purdue work.
2. Food Consumption Subgroup Interim Report
3. Analysis and draft recommendations on the most recent Purdue work by some subgroups.

**October:** James Duffy will send out a poll to determine the best available dates. The format will be presentation and discussion of draft recommendations by subgroups.

**November 4 and 5:** Final reports from each of the subgroups.

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### **Public Comments:**

Several opportunities for public comment were offered throughout the workgroup meeting and there were no comments either in person, on the phone, or via email.

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### **Meeting wrap-up**

***Comment from the chair:***

The Chair expressed appreciation to all the EWG members for their efforts.