LCFS Expert Workgroup – Sub EWG on Carbon Emission Factors Work Plans

April 1, 2010

This draft work plan includes the following items:

1. Membership
2. Goals and objectives
3. Prioritized list of topics/questions that this subgroup intends to address
4. Invited technical advisors and other additional support needed
5. Timeline for addressing topics
6. Identify responsibilities for subgroup members

1. Membership

Co-chairs: Sonia Yeh (University of California, Davis) and Richard Nelson (Kansas State University)

Other EWG members: Michael O’Hare (University of California, Berkeley), Don O’Connor (representing CDFA, S&T Consulting), Holly Gibbs (Stanford University), Steffen Mueller (University of Illinois at Chicago), Uwe Fritsche (Oeko-Institut, Germany)

ARB staff representative: Kevin Cleary

2. Goals and objectives

This goal of this subEWG is to survey the existing databases of emission factors, methodology and assumptions, and come up with a set of recommendations that will help to improve the current emission factors used in the CARB ILUC analysis.

The proposed work plan would have the following principles:

1. The issue is relevant and critical for the analysis
2. The assumptions can be validated
3. The issue can be addressed within reasonable amount of timeframe (short-term vs. long-term)

3. Prioritized list of topics/questions that this subEWG proposes to address

Below is a list of key topics/questions identified by this subEWG

3A. Identify and compare the existing datasets on carbon stock and fluxes, methodologies and assumptions used in ILUC analysis, and identify key gaps. The comparison should include, but not limited to,
   • Land types and associated covers (collaborative with sub-group #3 on land cover types)
Identify potential circular references between data sets

Data (and the spatial resolution) on C stock (biomass C and soil C), fluxes (sources and sinks)\(^1\) in the reference scenario

Methodology and assumptions used to calculate emission factors. These include the assumption about
- the rate and duration (and the spatial resolution) of biomass and soil C loss after conversion,
- The rate and duration (and the spatial resolution) of C uptake (+/-) after land use conversion in the corresponding converted land use type(s)\(^2\)

3B. Identify additional datasets on carbon stock and fluxes and the methodology and assumptions that can be used to improve ILUC analysis

- Focus on improving spatial and temporal (mature vs. growing vegetation) resolution of the data and methodology/assumptions of calculating emission factors
- Quantify N2O emission factors that can be incorporated into the analysis
- Identify important GHG emission sources and sinks that are ignored in previous analysis. e.g.
  - additional fertilizers that will be required to improve yield
  - other inputs changes (e.g. energy inputs +/-) associated with yield and/or management changes
  - higher grazing rates/yields on abandoned cropland,
  - credits for crops that sequester N2O,
  - GHG emissions from land that stayed in the same use category but changed management practices.
- Identify important GHG emission sources and sinks that will be modified by scenarios. e.g.
  - additional fertilizers that will be required to improve yield
  - other inputs changes (e.g. energy inputs +/-) associated with yield and/or management changes
  - GHG emissions from land that stayed in the same use category but changed management practices,
  - GHG emissions changes (+/-) due to crop switching, less intensive field management, less intensive energy use, etc.

4. Invited technical advisors and other additional support needed

All of the names listed below are experts identified by the members of the subEWG. They have not been formally contacted to provide their inputs to the subEWG.

- Experts who are knowledgeable about current analyses and datasets
  - Nancy Harris, Sean Grimland and Sandra Brown/Winrock
  - Experts from Woods Hole
  - Sassan Saatchi (NASA JPL) - tropical to global biomass maps using satellite data

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\(^1\) This is used to characterize foregone sequestration

\(^2\) For example, in the case of converted cropland, what’s the assumed periods of abandonment, cultivation, regrowth/reclamation, and the next transitional land use cover type and the corresponding C +/- (as a function of space and time).
Experts from MIT
- Johan Six and Emma Suddick – comparative study of current emission factors in the EPA/CARB analysis; N2O emissions (UCD)
- Experts involved in the European studies

- Experts who are willing to provide inputs and perhaps contribute to the writing
  - UCD/ Life Cycle Associates, LLC from CEC FFCA Deliverable

- Experts who are willing and review our recommendations
  - Brent Sohngen/OSU
  - Richard Houghton (WHRC)
  - Dr. Charles Rice, Kansas State University
  - Dr. Tristam O. West, ORNL

5. **Timeline for addressing topics:** In order to plan dates and agendas for future EWG meetings, a timeline for resolving subgroup issues and preparing materials for full EWG consideration is needed. We are planning for the expert workgroup to meet monthly through November 2010.

6. **Identify responsibilities for subgroup members:** Please see the proposed timeline and proposed responsibilities for subEWG members and invited experts in the table below.

<table>
<thead>
<tr>
<th>Proposed work plan</th>
<th>Timeline</th>
<th>SubEWG members/Experts</th>
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</thead>
</table>
| 3A. Identify and compare the existing datasets on carbon stock and fluxes, methodologies and assumptions used in ILUC analysis, and identify key gaps. | April - June | Members: Holly Gibbs, Sonia Yeh
Experts:  
- Nancy Harris, Sean Grimland and Sandra Brown/Winrock  
- Experts from Woods Hole  
- UCD/ Life Cycle Associates, LLC from CEC FFCA Deliverable |
| 3B. Improve spatial resolution of the data and methodology/assumptions of calculating emission factors | May - September | Members: Holly Gibbs, Sonia Yeh, Don O'Connor
Experts:  
- Sassan Saatchi (NASA JPL) - tropical to global biomass maps using satellite data  
- MIT(?)  
- Experts from MIT  
- Experts involved in the European studies  
- UCD/ Life Cycle Associates, LLC from CEC FFCA Deliverable |
<p>| Quantify NO2 emission factors that can be incorporated into the | May - September | Members: Steffen Mueller |</p>
<table>
<thead>
<tr>
<th>Analysis</th>
<th>Experts</th>
<th>Members</th>
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<tbody>
<tr>
<td>Identify important GHG emission sources that are ignored in previous</td>
<td>Experts:</td>
<td>Members:</td>
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<tr>
<td>analysis</td>
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<td>Richard Nelson, Don O’Connor</td>
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<tr>
<td>Identify important GHG emission sources that will be modified by</td>
<td>Experts:</td>
<td>Representatives from other subEWGs especially the subEWG on Yield Elasticity, Land Cover Type, Other Energy, and Time Discounting</td>
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<td>scenarios</td>
<td>- Sassan Saatchi (NASA JPL) - tropical to global biomass maps using satellite data</td>
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<td>UCD/ Life Cycle Associates, LLC from CEC FFCA Deliverable</td>
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<td>Recommendations by the subEWG</td>
<td>Experts:</td>
<td>Members: all</td>
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