Conclusions of the 3rd GBEP Task Force Meeting on GHG Methodologies

FAO Headquarters (Rome), 26 September 2008

The Greenhouse Gas (GHG) Task Force of the Global Bioenergy Partnership (GBEP) held its 3rd meeting in Rome on 26 September 2008. This taskforce was created to design a common methodological framework for lifecycle analysis (LCA) of greenhouse gas emissions associated with biofuel production and use. At the previous meeting of the Task Force a ten box LCA framework was proposed, and four subgroups were charged with the work of developing detailed reporting checklists for each step in the LCA. The primary purposes of this meeting were for subgroups to report on progress and for the Task Force to identify points of the LCA that require further attention. All four subgroups (led by the USA, the EC, Germany, and Brazil) achieved considerable progress since the last meeting.

Based on the work of the subgroups the co-chairs (USA and UN Foundation) presented an updated version of the checklist to the Task Force at the beginning of the meeting (Figure 1). The Task Force discussed the updates and identified areas needing further discussion.

At the conclusion of the meeting, subgroups were issued a set of action items and schedule of work aimed towards delivering a draft methodological framework for biofuel LCA to the GBEP Steering Committee at their 17 November meeting.

Remaining Issues and Subgroup Tasks

Each subgroup provided a brief update on the work they accomplished between meetings and highlighted the changes they suggested to the draft methodological framework. After discussion, the Task Force as a whole identified a number of issues that must be resolved as work on the LCA reporting framework moves forward. With respect to the overall work of the Task Force, participants also discussed the possibility of going on to consider appropriate answers to questions identified in the current methodological framework. The following highlights the key discussion items and next steps of the four subgroups:

Subgroup 1

Issues Identified and Discussed

1. It would be useful to identify the audience for this framework—who is doing the reporting?
2. Guidelines for bounding the LCA should be provided. That is, a minimum GHG contribution should be required for a process to warrant inclusion in the LCA.
3. For land use change, timescale of analysis is an important factor. An LCA report should provide full information on how many years are included in estimates of emissions related to land use change.
4. It would be useful to identify a minimum level of integrity required of any data included in the LCA. The report should also include a method for reporting uncertainty associated with emissions estimates.

5. Emissions associated with indirect land use change should absolutely be included in the LCA, but there is a need to identify/develop reliable methods for producing these estimates.

Tasks

1. As the subgroup has opted for a narrative approach in reporting land use change, it should provide some short guidance to the user of the framework as to the information that should be included in the narrative (e.g., land use history, canopy structure, etc.).
2. Some work would be required (time allowing) to define a framework for reporting on integrity for data included in the LCA.
3. Better information is required for establishing the "reference scenario" used to assess land use change.
4. The subgroup chair will work to address additional comments raised during the meeting.

Subgroup 2

Issues Identified and Discussed

1. It is difficult to define a co-product, and subsequently to identify methods for estimating the emissions produced/offset by each co-product in the production cycle.
2. Different co-products will require different accounting methods. It is important that the method, source of parameters, and uncertainty be provided for each co-product included in the LCA.
3. For biomass processing, it is necessary to decide whether emissions embodied in plant construction will be included in the LCA. If they are included, over what time period should these emissions be pro-rated? If not, is the biofuel LCA analogous to the LCA of the fuel that it is replacing?
4. The point was made with respect to biomass processing that "waste" feedstock is not easily defined. This must be clarified.

Tasks

1. The chair requested that Subgroup 2 add Box 2 to its mandate. This Box could be expanded to include a definition and guidance of any feedstock classified as a "waste product."
2. More guidance is required in the checklist for defining and accounting for co-products.
3. A number of nations raised technical issues associated with these boxes, and the subgroup chair is requested to collect and address these concerns.

Subgroup 3

Issues Identified and Discussed

1. There was some discussion of dropping transport from the LCA, since it is generally a minor component of total emissions. However, it was decided that transport must be maintained, both to confirm that its contribution is, in fact, minor in most cases, and to ensure that cases of long distance transport will be accounted for.

2. With respect to fuel use: the group focused exclusively on solid and liquid bioenergy. A checklist for gaseous fuels must be added.
3. With respect to fuel use: fuel use efficiencies are frequently neglected in LCA, but they can be important in their effects on greenhouse gas emissions and will be included in the framework.

Tasks

1. Create a box for gaseous fuels.
2. Research and address accounting for emissions related to efficiency of fuel use.
3. Address technical issues as they arise in further email discussions.

Subgroup 4

Issues Identified and Discussed

1. A key issue for this subgroup is its task to develop GHG reporting methods for fossil fuels that are analogous to those that the other subgroups are developing for biofuels—this means that the work has necessarily lagged that of the other groups.
2. How do we define the boundaries for LCA of fossil fuels, when analogies with biofuels are not always straight-forward. For example, do we count mining emissions associated with coal? Or plant construction emissions for facilities that are already built?
3. Should biofuel emissions be compared with the average national fuel mix, or with the marginal fuel needs that the biofuels are replacing?
4. The subgroup focused on liquid and gaseous fuels. Solid fuels have not yet been addressed.

Tasks

1. Develop a framework for solid fossil fuels.
2. Clarify methodology issues for GHG accounting in fossil fuels. It is important to understand analogies and discrepancies with biofuel LCA methods.
3. Address technical issues as they arise

Timeline

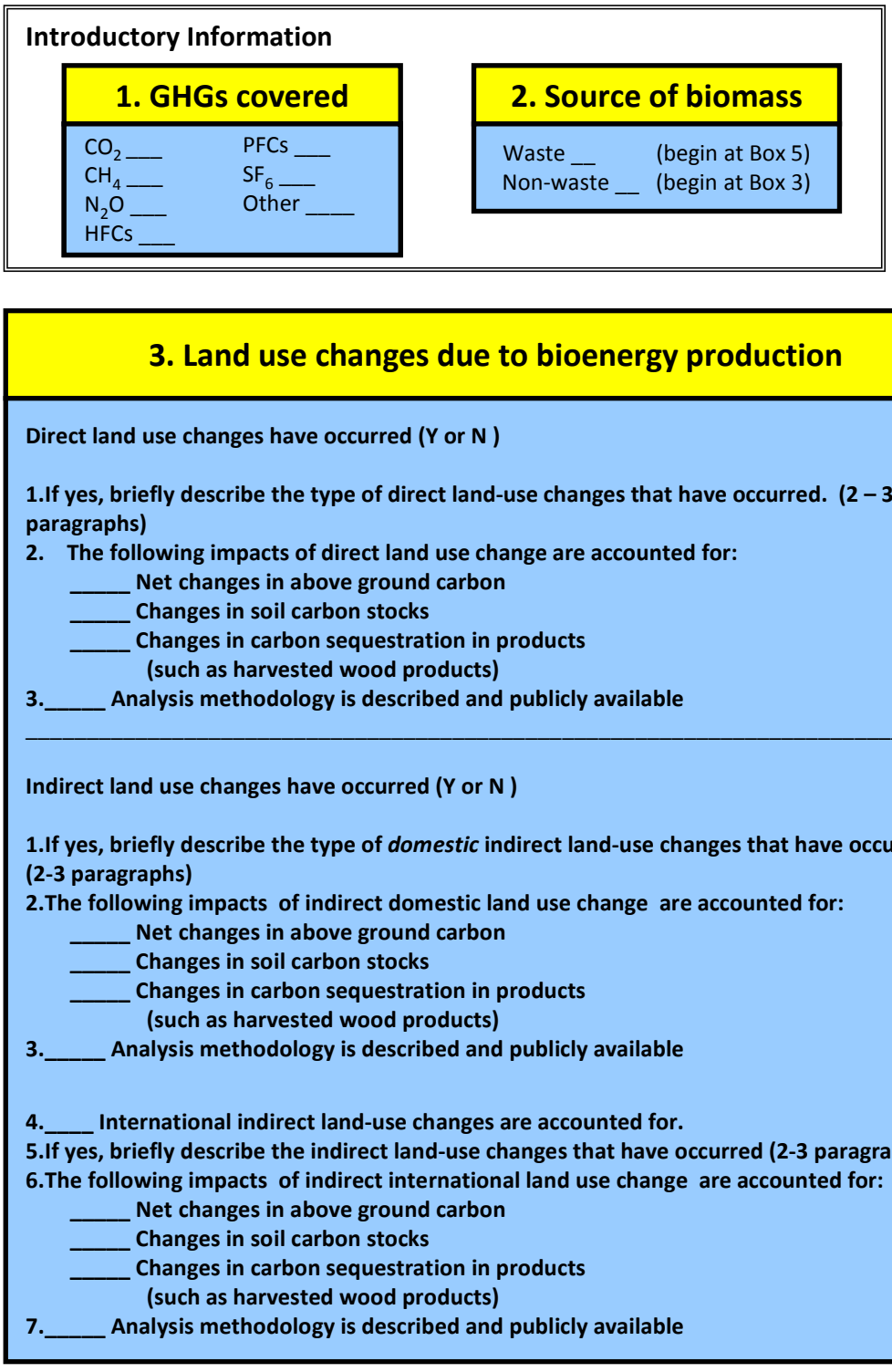
The chair requested that all subgroup leaders adhere to the following timeline:

- October 8th - Subgroup chairs will email group members asking for inputs;
- October 24th - Deadline for responses to subgroup chairs;
- October 31st - Subgroup chairs will provide a "final" version from the subgroup;
- November 7th - Deadline for comments on the "final" subgroup reports;
- November 10th-14th - Task Force chairs will compile the results and seek comment;
- November 17th - Task Force output is provided to the GBEP Steering Committee.

Next meeting

The 4th meeting of the GBEP Task Force on GHG Methodologies will be held on 17 November 2008 (in the morning) in Sao Paulo, in the context of the International Conference on Biofuels.

Figure 1: LCA Framework as of 26 September 2008



4. Biomass feedstock production on farms and in forests

Focus on Direct Emissions:

Sources of direct GHG emissions are accounted for:
_____ Emissions from operating farm machinery
_____ Energy used in irrigation
_____ Energy used in preparing feedstocks (drying grains, densification of cellulosic biomass, etc.)
_____ Energy used in transport of feedstocks
_____ CO2 from lime/dolomite applications
_____ On-farm N2O emissions from nitrogen fertilizers (direct, volatilization, runoff/leaching)
_____ CH4 emissions from lands (especially wetlands)
_____ Other (please specify)

Focus on Embodied Emissions:

Sources of GHG emissions embodied in inputs accounted for:
_____ Emissions embodied in the manufacture of farm machinery
_____ Emissions embodied in the farm buildings
_____ Emissions embodied in the manufacture of fertilizer inputs.
_____ Emissions embodied in the manufacture of pesticide inputs
_____ Emissions embodied in purchased electricity
_____ Other (please specify)

5. Byproducts and co-products

Byproducts or co-products are produced (Y or N)

If yes:

1.List all co-products from the biomass and identify their ultimate use/fate.
2.List any co-products from processing that are not directly derived from biomass (e.g., gypsum)
3.____ The amount of biomass that goes into each co-product is reported.
4.____ The amount and the characteristics of each co-product is reported.
5.____ Physical properties and/or the economic value of the co-products are reported.
6.____ Specific end-uses of the co-products are known, and the products that they replace have been identified.
6a. ____ An emissions comparison has been performed to compare co-products to the products they replace.
7.____ For each co-product taken into account, a publicly-available accounting methodology is provided.

6. Transport of biomass

Biomass is transported from farm/plantation/forest to processing plant (Y or N)

If yes:
1. ____ The biomass transported in a different commodity type.
1a. ____ A description of intermediate processing steps is available.
1b. ____ Emissions associated with intermediate processing are accounted for (including, e.g., electricity used for processing).

2. ____ There is a multi-stage transport chain (e.g. truck to ship to truck or train).
2a. List all stages in the transport chain.
2b. Specify the stages for which stages emissions are accounted.

3. Transport from the production site to the use processing plant is dedicated to this purpose. (Y or N)
If Yes:
3a. ____ All transport emissions are included
If No:
3b. ____ A portion of transport emissions are allocated, and the allocation methodology is described.

4. ____ Return run of transport equipment is accounted for.
4a. During the return run, transport equipment is:
____ empty ____ otherwise utilized

7. Processing into fuel

The biomass requires processing to produce fuel (Y or N)

If yes:
1. _____ GHG emissions associated with material inputs used in the conversion process (e.g. chemicals, water) are accounted for.
2. _____ GHG emissions associated with the energy used in the conversion process are accounted for
3. _____ GHG emissions associated with electricity taken from the grid are accounted for.
4. Specify the method used to account for grid-related emissions (e.g. average/marginal, national/regional, actual/future):
_____
5. _____ Other GHG emissions from the process, such as GHG emissions from wastes and leakages (including waste disposal) are accounted for.
6. _____ GHG emissions associated with the plant construction are accounted for.
If yes:
6b. Estimates of emissions associated with plant construction have been pro-rated to account for:
_____ Other uses of the plant
_____ Design life of the plant
_____ No pro-rating; all construction emissions are included in the analysis.

8. Transport of fuel

Fuel is transported from processing plant to use site (Y or N)

If yes:
1. ____ The fuel transported in a different commodity type.
1a. ____ A description of intermediate processing steps is available.
1b. ____ Emissions associated with intermediate processing are accounted for (including, e.g., electricity used for processing).

2. ____ There is a multi-stage transport chain (e.g. truck to ship to truck or train).
2a. List all stages in the transport chain.
2b. Specify the stages for which emissions are accounted.

3. Transport from the processing plant to the use site is dedicated to this purpose. (Y or N)
If Yes:
3a. ____ All transport emissions are accounted for.
If No:
3b. ____ Transport emissions are pro-rated, and the methodology for pro-rating is described.

4. ____ Return run of transport equipment is accounted for.
4a. During the return run, transport equipment is:
____ empty ____ otherwise utilized

9. Fuel use

For solid biomass fuel:

Emissions from usage:

1. Identify the conversion/combustion technology used: _____
2a. List significant GHG emissions known to be specifically associated with the applied conversion/combustion technology (e.g., N_2O in CFB-type boilers, CH_4 in low level or small-scale techniques) _____
2b. ____ If 2a was left blank, evidence is provided to exclude the occurrence of such specific GHG emissions
3. _____ The biomass is tainted with fossil material (e.g. in case of waste sources)
   3a. _____ Analyses of degree and content of tainting are available.

For use occurring in a CHP facility:

1. The GHG assessment addresses:
   ___ electricity ___ heat (thermal energy) ___ both
   If electricity is included:
2. ___ The electric efficiency of the use process is reported.
3. ___ The electricity is sent to a general grid.
4. ___ The reference system for GHG comparisons with other sources of electricity is reported. (e.g., national average grid, typical fossil fuel mix, etc.)
   If heat is included:
5. ___ The thermal efficiency of the use process is reported.
6. ___ The reference system for GHG comparisons with other sources of heat is reported.

For use associated with a technology upgrade (e.g. pile burning to modern energy technology):

1. _____ Data on the replaced technology are available.

For biomass derived from waste products:

1. ___ Waste treatment processes are accounted for.
2. ___ An alternative waste treatment exists
   2a. ___ Emissions comparisons are provided.
3. ___ Waste is allowed to decay.
   3a. ___ Emissions from biomass decay (CH_4, N_2O) are accounted for.

For liquid fuel:

1. Kilometers per energy unit: _____
2. _____ Tail pipe emissions are accounted for.

Subgroup Note: need to add a blue box for gaseous fuels

10. Comparison with replaced fuel

1. Identify Methodology.
2. This methodology is publicly available (Y or N)
3. Are you addressing the LCA of fossil fuel? (Y or N)

For crude oil:

1. Specify type of crude (e.g. tar sands, heavy oil, pre-salt):
   _____
2. ____ There is an associated natural gas
   2a. Treatment of associated natural gas:
   ____ flaring ____ reinjection ____ processing/direct use
   2b. ____ There is a natural gas processing point to remove liquids
   2c. ____ Emissions from extracted liquids are accounted for
   2d. ____ Emissions for electricity production are accounted for
3. ____ The crude/natural gas is transported
   3a. Transportation is: ___ domestic ___ international ___ both
   3b. Emissions are accounted for:
   ___ domestic ___ international
   3c. ____ Fugitive emissions during transport are accounted for
   3d. ____ Country-specific parameters are included in emission calculations for domestic transport.
   3e. ____ Return journeys of transport fleet are accounted for, when appropriate.
4. ____ The production/transport system involves liquified natural gas
   4a. ____ Emissions from the regasification plant are accounted for
5. ____ Fuel production includes a refining process
   5a. ____ Direct refinery emissions are accounted for
   5b. ____ Embodied refinery emissions (plant, machinery) are accounted for
   5c. ____ Energy embodied in chemical products (catalizers, solvents, etc.) are accounted for
   5d. ____ Fugitive emissions are accounted for
   5e. ____ Emissions for hydrogen production are accounted for
6. ____ There are significant co-products produced
   6a. ____ Emissions associated with co-products are accounted for
   6b. ____ These accounting methodologies are publicly available

Subgroup Note: need to add a blue box for solid fuels