

LCFS Expert Workgroup – Time Accounting Subgroup Draft Work Plan

1. Membership

Jeremy Martin (chair) Jesper Hedal Kløverpris (co-chair), Keith Kline, Steffen Mueller, Michael O'Hare, James Duffy.

2. Prioritized list of topics/questions that the subgroup proposes to address

Overarching questions to be answered as each topic below is analyzed include:

- Do the potential improvements in the portrayal of expected effects of the GHG emissions over time warrant the use of a proposed change in time accounting methods?
- And how does the time accounting affect uncertainty levels? E.g. do the proposed changes reduce, increase, or better characterize, the uncertainty associated with the portrayal of expected effects?"

Task list

a. Evaluation of different methods for time accounting

Methods to be evaluated include annualization (straight-line amortization currently used in the ARB, EPA, and EU modeling), discounting, fuel warming potential, and fuel warming potential with discounting – e.g. analysis of what factors to consider when determining appropriate discount rates and whether discount rates should differ between the project and impact horizons, or be variable over time. This task will involve performing a literature review of time accounting methods and evaluating the advantages and disadvantages of the methods.

b. Estimating social costs and benefits of fuel substitution

– implications of time horizons, indicators, and measures The first part of this task will be to review time horizon and assessment formulas used in ILUC modeling and observations from public comments on ARB and EPA regulations, and to recommend a practice for ARB. The second part will be to compare various indicators and measures of net benefit that could be used for fuel pathways, especially for ILUC effects, including but not limited to total GHG discharge, IPCC GWP indices, total warming to a chosen target time, and net temperature increase at a specified time and characterize their practicality for regulatory use and the degree to which they are likely to move the fuel system in California toward minimizing climate change social cost. If possible, we will recommend a preferred methodology for the LCFS. The task supports and feeds into task a above.

c. Evaluation of how to incorporate the “reversibility” of impacts over time

This task will consider the degree of reversibility, probability of reversion, and emission effects of reversion over time among different fuel choices. A literature review and consultation with experts in related fields will lead to

recommendations for if and when it may be appropriate to include the potential for land reversion and if so, how to estimate to what extent and over what time periods the land reversions occur.

d. Evaluation of the effects of methods that incorporate improved baseline data for land use and emissions

This task will review current baseline projections used by FAO, IEA, IPCC, USDA and the scientific community, along with empirical data on land use trends to determine whether current trends in global land use can be used to improve projections of future global land use (region by region, with and without the bioenergy policy), and how these baseline projections interact with the selected approaches for time accounting.

e. Assessment of an alternative conceptual approach to LUC emissions over time

This task will review the literature to consider the effects on ILUC emissions of the hypothesis (supported by extensive empirical evidence) that nations of the world inevitably (eventually) reach a point in economic development that coincides with a “forest transition” (a.k.a. the “Mather curve”) – when the progression of natural land conversion and forest loss transitions to a more stable state or net recovery. The task will assess the implications of this hypothesis for time accounting of emissions. It will also consider whether such an approach merits review of what are the most appropriate metrics for measuring LUC emissions over time (e.g. is fuel production the appropriate denominator when assessing long-term impacts?). Results from this task will support task (d) above by characterizing a baseline for consideration.

f. Numerical comparison of the different time accounting methods

This task will quantify the implications of using the different time accounting approaches identified or proposed through the tasks above.

3. Invited technical advisors and other additional support needed

- a. Liz Marshal (or Alexia Kelly), WRI. Note workshop in DC on April 29th.
- b. Alan Grainger (Leeds) or other co-author of “forest transition” studies
- c. Lew Fulton, IEA baseline projections
- d. Representatives from USDA, FAO, others (baseline LUC projections)

4. Timeline for addressing topics

Draft products are to be distributed among the group members by the end of each month. Products will be shared and modified based on input from the subgroup members and invited experts.

- **April:** Task leaders conduct literature review and share draft outline and initial references/sources.
- **May:** Task leaders assemble descriptions for each proposed alternative approach, alternative land use baseline, and key time accounting parameter options to be assessed (table format).

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- **June:** Task leaders for b, c and e share initial draft assessments (these contribute to potential set of analyses in tasks a, d, and f).
- **July:** Draft alternative approaches/baselines to be summarized and compared are selected. System for comparative analysis in task (f) proposed.
- **August:** Implementation of evaluations for selected alternative approaches (this will lead to input to f).
- **By September 15,** draft summary of findings for each task should be developed and assigned to team members for write-up.

5. **Identify responsibilities for subgroup members**

Each proposed alternative approach, whether for a metric, a methodology, or a baseline, will be researched and summarized by one team member and outline shared by April 30 for consideration of other sub-group members.

- a. Steffen Mueller
- b. Michael O'Hare
- c. Jeremy Martin
- d. Jesper H. Kløverpris
- e. Keith L. Kline
- f. James Duffy (coordinator)