



## **Session 2**

# **LCA Modeling Overview**

**Pros and Cons of Available Models, Systems Integration,  
Model Comparison and Economics**

### **Session Objectives**

- What are the key similarities and differences among models?
- What are the key results of biofuels from the models?
- What are the three primary inputs in each model that have the most influence on well-to-wheel GHG emissions from biofuel pathways?
- Are there any potential "big-ticket" items that are currently ignored because of a lack of data?
- What research could be conducted to reduce the uncertainty in those primary inputs?

**Chairpersons:**

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## Session 2

# LCA Modeling Overview

### Highlights and Learnings

- Both systematic uncertainties and technical uncertainties affect LCA results
- General agreement that systematic uncertainties, especially ILUC, are highly uncertain (predicting the future is difficult)
- N<sub>2</sub>O emissions vary significantly across regions; soil type/moisture, type of fertilizer applied and fertilizer intensity, among other factors, affect regional variations
- Though uncertainty analysis in all models can be and was conducted, data availability and quality have limited the extent and intensity of uncertainty analysis
- For consistency and completeness, all significant indirect effects from all fuels may need to be addressed
- Transportation LCA models may need to be developed on a generally agreed-on protocol



## Session 2 LCA Modeling Overview

### Gaps Identified

- Treatment of co-products differs greatly among studies and fuel products and has a significant impact on the estimates
- Data quality varies across different LCA stages and different fuel production pathways; data comparability across models is lacking
- Large variability in N<sub>2</sub>O conversion factors
- Large variability in soil carbon changes
- Key input data for LCAs need to be audited for reliable LCA results
- System boundary-related omissions from current models could be important
- Fate of carbon on land prior to conversion and land reversion after biofuel programs could be important