

Program

CRC WORKSHOP ON LIFE CYCLE ANALYSIS OF BIOFUELS

Argonne National Laboratory

Argonne, IL

October 20-21, 2009



WORKSHOP SPONSORS

API

Argonne National Laboratory

CONCAWE

Canadian Petroleum Products Institute

Environmental Defense Fund

National Biodiesel Board

National Renewable Energy Laboratory

Natural Resources Canada

Renewable Fuels Association

South Coast Air Quality Management District

US Department of Agriculture

US Department of Energy

WORKSHOP ORGANIZERS

Vincent Camobreco	US Environmental Protection Agency	David Lax	API
Roger Conway	US Department of Agriculture	Derek McCormack	Natural Resources Canada
John Courtis	California Air Resources Board	Kristy Moore	Renewable Fuels Association
John DeCicco	University of Michigan/Consultant for EDF	Mani Natarajan	Marathon Oil Company
Dominic DiCicco	Ford Motor Company	Kenneth Rose	CONCAWE
James Duffield	US Department of Agriculture	Charles Schleyer	ExxonMobil Research & Engrg.
Marvin Duncan	US Department of Agriculture	Don Scott	National Biodiesel Board
Phil Heirigs	Chevron Global Downstream	Michael Wang	Argonne National Laboratory
Steve Howell	National Biodiesel Board	Paul Wuebben	South Coast Air Quality Management District

Specific Workshop Goals:

- Outline technical needs arising out of policy actions and ability of LCA analysis to meet those needs.
- Identify data gaps, areas of uncertainties, validation/verification, model transparency, and data quality issues.
- Establish priorities for directed research to narrow knowledge gaps and gather experts' opinions on where scarce research dollars would best be spent.

Monday, October 19, 2009

Argonne House

5:00 - 6:00 PM *Registration*
Argonne House

6:00 - 7:00 PM *Welcome Reception*
Cocktails and Hors d'Oeuvres at Argonne

Tuesday, October 20, 2009

Auditorium

7:00 - 8:00 AM *Registration*
Continental Breakfast in Gallery

8:00 AM *Welcome: Charlie Schleyer (ExxonMobil) and Phil Heirigs (Chevron)*

Session 1 Regulatory Framework and Regulatory Agency Needs

1. *What are the Regulatory Agency Needs? Do we have enough data now to answer the needs? If not, what data are required?*
2. *What are the RFS2 and LCFS requirements and how they are calculated. What are the uncertainties? How can they be minimized?*
3. *What are the most important data requirements and what are the future research needs?*

8:10 AM *Chairpersons: Mani Natarajan (Marathon Oil Company), John Courtis (CARB), Vince Camobreco (US EPA)*

8:15 AM **Framework and Regulatory Agency Needs – National Biodiesel Board** (15 min + 5 Q&A) Larry Schafer NBB

8:35 AM **EPA'S Lifecycle GHG Analysis of Biofuels for RFS2** (20 min+5 Q&A) Bob Larson US EPA

9:00 AM **Accounting for Ghg Emissions from Biofuels Production and Use in EU Legislation** (20 min+5 Q&A) Luisa Marelli Joint Research Centre

9:25 AM **The Status of California LCFS** (20 min+5 Q&A) John Courtis CARB

9:50 AM General Discussion (20 min)

10:10 AM - 10:35 AM BREAK in Gallery

Session 2 LCA Modeling Overview: Pros and Cons of Available Models, Systems Integration, Model Comparison and Economics

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

10:35 AM *Chairpersons: Michael Wang (Argonne) and Phil Heirigs (Chevron)*

10:40 AM **REET Model and Biofuel Life-Cycle Analysis Issues** (20 min+5 Q&A) Michael Wang Argonne National Laboratory

11:05 AM **GHGenius – Lifecycle Model for Transportation Fuels** (20 min+5 Q&A) Don O'Connor S&T Squared Consultants

11:30 AM **European Perspective on LCA Modeling + JRC-EUCAR-CONCAWE Well-to-Wheels Analysis** (20 min+5 Q&A) Jean-Francois Larivé CONCAWE

11:55 AM **Review of Transportation Fuel Life Cycle Analysis** (20 min+5 Q&A) Stefan Unnasch Life Cycle Associates

12:20 PM - 1:35 PM LUNCH in Gallery			
1:35 PM	Conceptual and Methodological Issues in Biofuel LCA (20 min+5 Q&A)	Mark Delucchi	UC Davis
2:00 PM	Toward a Level Playing Field for Biofuels: The Uses and Abuses of Life Cycle Analysis (20 min+5 Q&A)	Bruce Dale	Michigan State University
2:25 PM	General Discussion (20 min)		
2:45 PM	Session 3 Growing of Feedstocks and Soil/Fertilizer Interaction <i>1. What are the information needs to refine GHG emissions estimates from feedstock production for current biofuels?</i> <i>2. How much is known about the energy and nutrient inputs and associated GHG emissions from purpose-grown energy crops and 2nd generation biofuel crops such as cellulose or algae? What are the key uncertainties and data needs?</i> <i>3. How can the uncertainties be reduced surrounding N2O emissions that are a function of fertilizer application rates, nitrogen fixing crop rotation patterns, temperature, soil moisture content, cropping methods, etc?</i> <i>4. How much is known about the impacts of putting into production land not previously used for growing crops, either for purpose grown energy crops or for dual-purpose crops? What are the knowns and unknowns about nutrient inputs and carbon emissions from the use of previously un-disturbed land?</i>		
2:45 PM	<i>Chairpersons: Don Scott (NBB) and Phil Heirigs (Chevron)</i>		
2:50 PM	Overview of Agriculture for Biofuels in the US (20 min+5 Q&A)	Hosein Shapouri	US Department of Agriculture
3:15 PM	Technology, Cultivation Practices and Energy Inputs for Biodiesel Feedstocks (20 min+5 Q&A)	Alan Weber	National Biodiesel Board
3:40 PM - 4:00 PM BREAK			
4:00 PM	Energy Inputs for 1st and 2nd Generation Ethanol Feedstocks: Modeling Effects of Cultivation Practices and Crop Selection on GHG Emissions (20 min+5 Q&A)	Keith Kline	Oak Ridge National Laboratory
4:25 PM	Greenhouse Gas Emissions From Agricultural Systems (20 min+5 Q&A)	Jerry Hatfield	US Department of Agriculture
4:50 PM	A Biogeochemical Approach to Understanding the Ecological Sustainability of Biofuel Feedstocks (20 min+5 Q&A)	Evan De Lucia	University of Illinois
5:15 PM	General Discussion (20 min)		
5:35 PM	End of Day		
6:30 PM Reception in Argonne House			
7:00 PM Dinner in Argonne House			

Wednesday, October 21, 2009

Auditorium

7:30 - 8:00 AM Registration
Continental Breakfast in Gallery

Session 4 Land Use Change and GHG Emissions

1. *What are the premises that underpin different approaches for assessing the impact of land-use change? Can the premises be tested with data now or in future. What premises are untestable?*
2. *What are the other major differences among studies and sources of uncertainty in land-use impact estimates, and how can differences be resolved and uncertainties narrowed?*
3. *How does rate of growth in biofuels relative to ag productivity growth impact land-use change estimates?*
4. *What are most important data or analysis tools for improving land-use impact estimates, and what are the future research needs?*

8:00 AM Chairpersons: John DeCicco (University of Michigan), Jim Duffield (USDA), Charlie Schleyer (ExxonMobil)

8:05 AM	Indirect Emissions From Land Use Change (20 min+5 Q&A)	John Reilly	MIT
8:30 AM	Biofuels Land Use Change and Sustainability Activities at DOE (20 min+5 Q&A)	Zia Haq	US Department of Energy
8:55 AM	Estimating GHG Emissions Induced By Biofuels (20 min+5 Q&A) - CANCELLED	Wallace Tyner	Purdue University
9:20 AM	Overview of the CARD-FAPRI Modeling System (20 min+5 Q&A)	Bruce Babcock	Iowa State University

9:45 - 10:05 AM BREAK in Gallery

10:05 AM	Pathways Of Agricultural Expansion Across The Tropics: Implications For Carbon Payback Times (20 min+5 Q&A)	Holly Gibbs	Stanford University
10:30 AM	European View On Land Use Change (20 min+5 Q&A)	Pita Verweij	Utrecht University
10:55 AM	General Discussion (25 min)		

Session 5			
Biofuel Processing and CoProduct Credits			
<p><i>1. What are the proper methods and key elements in determining carbon intensity for individual biorefineries? What information is needed to reduce uncertainty and enhance the verification of LCA for different production options? What are the key uncertainties and how can they be reduced? What are the appropriate research priorities?</i></p> <p><i>2. What are the limitations of current co-product LCA methods, and how can uncertainties and verification issues be better addressed? How should co-products be treated in the context of market transitions expected in the future? What are the appropriate research priorities?</i></p>			
11:20 AM	Chairpersons: Kristy Moore (RFA), Dominic DiCicco (Ford), Paul Wuebben (SCAQMD)		
11:25 AM	Production and Co-product Technology Summary of Options (3 short talks 5 min each)	Nat Harrison Kevin Adams Jim Dumesic <i>(Presented by Jesse Bond)</i>	Tetra Vitae Abengoa Wisconsin Bioenergy Initiative
11:40 AM	Co-Product Credit Considerations for Biofuels LCA (20 min+5 Q&A)	Andy Aden	NREL
12:05 PM	Emerging Technologies Impact Corn Ethanol's Energy and Environmental Profile (20 min+5 Q&A)	Steffen Mueller	University of Illinois
12:30 PM - 1:45 PM LUNCH in Gallery			
1:45 PM	Magnitude and Variability in Emissions Savings in the Corn-Ethanol Life Cycle from Feeding Co-Products to Livestock (20 min+5 Q&A)	Adam Liska	University of Nebraska
2:10 PM	Distillers Grains Displacement Ratios for Corn Ethanol Life-Cycle Analysis – Limitations and Uncertainties (20 min+5 Q&A)	Salil Arora	Argonne National Laboratory
2:35 PM	General Discussion (20 min)		
Session 6			
Workshop Summary and Panel Discussion			
2:55 PM	Chairpersons: Charles Schleyer (ExxonMobil), James Duffield (US Dept. of Agriculture), Ken Rose (CONCAWE)		
3:00 PM	Panel Discussion		
3:30 PM	Open Discussion		
4:00 PM	End of Workshop		
4:30 PM	Optional: Tour of Argonne Center for Transportation	Glenn Keller	Argonne National Laboratory

