

# Program

## CRC WORKSHOP ON LIFE CYCLE ANALYSIS OF TRANSPORTATION FUELS

Argonne National Laboratory

Argonne, IL

October 26-28, 2015



### WORKSHOP SPONSORS

API	Renewable Fuels Association
Argonne National Laboratory	South Coast Air Quality Management District
CONCAWE	US Department of Agriculture
Canadian Fuels Association	University of Michigan Energy Institute
National Biodiesel Board	

### WORKSHOP ORGANIZERS

Vincent Camobreco**	US Environmental Protection Agency	Robert Larson	US Environmental Protection Agency
Geoff Cooper	Renewable Fuels Association	David Lax	API
Robert De Kleine	Ford Motor Company	Luisa Marelli	Joint Research Center,
John DeCicco	University of Michigan		Institute for Environment and Sustainability
James Duffield	US Department of Agriculture	Jeremy I. Martin	Union of Concerned Scientists
Jeff Farenback-Brateman**	ExxonMobil	Devin O'Grady	Natural Resources Canada
Heather Hamje	CONCAWE	Don Scott	National Biodiesel Board
Henry Hogo	South Coast AQMD	Daniel Short	Marathon Petroleum
Amit Kapur	Phillips 66	Laura Verduzco	Chevron
		Michael Wang	Argonne National Laboratory

*The purpose of the workshop is for the free exchange of ideas, research, data etc. Sponsorship of or participation in the workshop by CRC and others does not reflect any endorsement of information presented at the workshop.*

\*\* Workshop Co-Chairs

\* Presentations and times subject to change

rev. 10/28/2015

## **Specific Workshop Goals**

- Outline technical needs arising out of policy actions and ability of LCA analysis to meet those needs.
- Identify research results and activities that have come to light in the past two years that have helped to close data gaps previously outlined as outstanding issues.
- 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 26, 2015

Argonne House

5:00 - 6:00 PM

### Registration

Argonne House

6:00 - 7:00 PM

### Welcome Reception

Cocktails and Hors d'Oeuvres at Argonne House

## Tuesday, October 27, 2015

Auditorium

7:00 - 8:00 AM

### Registration

Continental Breakfast

8:00 AM

Welcome from Workshop Chairs: Vincent Camobreco (US EPA) and Jeff Farenback-Brateman (ExxonMobil)

### Opening

#### Background of CRC LCA Workshops

8:05 AM

Chairpersons: Vincent Camobreco (US EPA), Jeff Farenback-Brateman (ExxonMobil)

*The objective of this session is to bring participants up-to-speed on where we have been and how we have gotten to the 4th CRC LCA workshop. Will also include some background information on CRC as many of the workshop attendees may not be aware of CRC's history, membership, and charter.*

8:05 AM

#### CRC Background

Brent Bailey

CRC

8:15 AM

#### Background on the CRC LCA Workshops

Jeff Farenback-  
Brateman

ExxonMobil

### Session 1

#### Regulatory Environment/New Policies Driving LCA Pathways and Methodologies

8:30 AM

Chairpersons: Vincent Camobreco (US EPA), Jim Duffield (USDA), Jeff Farenback-Brateman (ExxonMobil)

*Overview of national, international, and state efforts to implement/revise renewable fuel and other climate-related transportation fuel policies.*

8:35 AM

**An Overview of National, International, and State Efforts to Implement/Revise Renewable Fuel and Other Climate-Related Transportation Fuel Policies**  
(20 min + 5 Q&A)

Chris Malins

ICCT

9:00 AM

**Update on Status of European Transportation Regulations** (20 min + 5 Q&A)

Heather Hamje

CONCAWE

9:25 AM

**Update from US EPA on RFS** (20 min + 5 Q&A)

Vincent Camobreco

EPA

9:50 AM

**Update from the Air Resources Board on the Low Carbon Fuel Standard (LCFS) Re-adoption**  
(20 min + 5 Q&A)

Anil Prabhu

ARB

10:15 AM

General Discussion (15 min)

10:30 AM - 10:50 AM

BREAK

### Session 2a

#### LCA Gaps, Uncertainties, and Methodology Development: General LCA Issues

10:50 AM

Chairpersons: Jeremy Martin (Union of Concerned Scientists), Don Scott (NBB), Michael Wang (ANL)

*This session will cover several key issues – biomass carbon accounting, biomass resources and potential GHG effects, LCA modeling approach limitations and improvements.*

10:55 AM

**Carbon Accounting Related to Bioenergy: Where do We Stand?** (20 min + 5 Q&A)

Helmut Haberl

Alpen-Adria-Universität Klagenfurt

11:20 AM

**Food for All and Biobased Economy: Fundamental Conflict or Essential Synergy for Sustainable Development** (20 min + 5 Q&A)

André P.C. Faaij

University of Groningen

11:45 AM

~~**Consequential LCA to Estimate Climate-Change Mitigation Benefits of Fuel Policies**~~  
(20 min + 5 Q&A) - (CANCELLED)

Rich Plevin

UC-Davis

12:10 PM

**Sustainable Bioenergy Supply Strategies: Uncertainties, Synergies and Trade-Offs**  
(20 min + 5 Q&A)

Edward Smeets

Wageningen University

12:35 PM - 1:55 PM LUNCH

**Session 2b LCA Gaps, Uncertainties, and Methodology Development: Co-Product Methods and Feedstock-Related Issues**

2:00 PM

*Chairpersons: Jeremy Martin (Union of Concerned Scientists), Don Scott (NBB), Michael Wang (ANL)*

*This session will address co-product methods and their effects, effects of adding other climate change attributes such as black carbon and albedo, biomass yield limitations and opportunities.*

2:05 PM

**Impacts of Co-Product Methods for Alternative Jet Fuel LCA in an International Context**  
(20 min + 5 Q&A)

Mark Staples

MIT

2:30 PM

**Impacts of Black Carbon and Albedo on Biofuel Climate Change Effects**  
(20 min + 5 Q&A)

Hao Cai

Argonne National Laboratory

2:55 PM

**Role of Uncertainty in LCA: Evaluation of Corn Ethanol and Biodiesel GHG Emissions**  
(20 min + 5 Q&A)

Mike Griffin

Carnegie Mellon University

3:20 PM

**Biomass Feedstocks for Bioenergy: Yield Limitations and Potentials**  
(20 min + 5 Q&A)

Chris Malins

ICCT

3:45 PM

**The 2016 Billion-Ton Report, Towards a Thriving Bioeconomy** (20 min + 5 Q&A)

Matt Langholtz

Oak Ridge National Laboratory

4:10 PM

General Discussion (15 min)

4:25 - 4:45 PM

**BREAK**

**Session 3**

4:45 PM

**Advances in Biofuels Modeling: LUC and Advanced Biofuels (Part 1)**

*Chairpersons: Geoff Cooper (RFA), Robert De Klein (Ford), Luisa Marelli (JRC), Laura Verduzco (Chevron)*

*This session will examine recent efforts to improve and revise land use change modeling, including the application of improved data sets and changes to model structure. European and North American perspectives of land use change and feedstock to bioenergy pathways updates will be presented and discussed.*

4:50 PM

**Recent and On-Going Changes in GTAP-BIO + Sensitivity Analysis on Recent CARB LUC/Emission Estimates** (20 min + 5 Q&A)

Wally Tyner

Purdue University

5:15 PM

**Using Recent Land Use Changes to Validate Land Use Change Models** (20 min + 5 Q&A)

Bruce Babcock

Iowa State University

5:40 PM

**END OF DAY**

6:30 PM

**Reception in Argonne House**

7:00 PM

**Dinner in Argonne House**

## Wednesday, October 28, 2015

### Auditorium

7:30 - 8:00 AM

#### Registration

Continental Breakfast

#### Session 3

##### Advances in Biofuels Modeling: LUC and Advanced Biofuels (Part 2)

8:00 AM

Chairpersons: Geoff Cooper (RFA), Robert De Klein (Ford), Luisa Marelli (JRC), Laura Verduzco (Chevron)

*This session will examine recent efforts to improve and revise land use change modeling, including the application of improved data sets and changes to model structure. European and North American perspectives of land use change and feedstock to bioenergy pathways updates will be presented and discussed.*

8:05 AM

**Mapping LUC in the U.S.—Recent Results, Accuracy, and Implications for Modeling**  
(20 min + 5 Q&A)

Tyler Lark

University of Wisconsin-Madison

8:30 AM

**Assessing ILUC Impacts of Conventional and Advanced Biofuels Consumed in the EU**  
(20 min + 5 Q&A)

Hugo Valin

IIASA

8:55 AM

**Soil Carbon Sequestration and Land Use Change Associated with Biofuel Production: Empirical Evidence** (20 min + 5 Q&A)

Steffen Mueller

University of Illinois-Chicago

9:20 AM

**Expanding System Boundaries in Attributional LCA to Assess GHG Emissions and Climate Impacts of Advanced Biofuels and Bioenergy Pathways**  
(20 min + 5 Q&A)

Luisa Marelli

JRC

9:45 AM

General Discussion (15 min)

10:00- 10:20 AM

BREAK

#### Session 4

##### Advances in LCA of Petroleum/Alternatives

10:20 AM

Chairpersons: Jeff Farenback-Brateman (ExxonMobil), Amit Kapur (Phillips66), Devin O'Grady (Natural Resources Canada)

*This session will explore the current state of knowledge and the most critical data needs to improve LCA estimates for petroleum-based fuels and non-biofuel alternatives. Topics to be discussed in this session include improvements in LCA of conventional petroleum, recent efforts to improve LCA estimates of oil sands extraction, issues related to natural gas extraction and implications for LCA, and an EU perspective on vehicle technology improvements.*

10:25 AM

**PRELIM - Petroleum Refinery Life Cycle Inventory Model** (20 min + 5 Q&A)

Joule Bergerson

University of Calgary

10:50 AM

**Global and Regional Greenhouse Gas Emissions of Petroleum-Derived Transportation Fuels**  
(20 min + 5 Q&A)

Robert Malina  
(Presented by  
Raymond Speth)

MIT

11:15 AM

**Modeling of Petroleum Refineries for Producing High Octane Fuels in the Context of Life Cycle Analysis** (20 min + 5 Q&A)

Michael Wang

ANL

11:40 AM

**Refinery Study and Well-to-Wheels Analysis of Higher Octane Ratings for U.S. Gasoline**  
(20 min + 5 Q&A)

Jim Anderson

Ford

12:05 PM

**Potential Economic and Environmental Benefits of Higher-Octane Gasoline**  
(20 min + 5 Q&A)

Raymond Speth

MIT

12:30 PM

General Discussion (15 min)

12:45 PM - 1:45PM

LUNCH

1:50 PM - 2:15 PM

Biofuel Meeting Summary by Don O'Connor (20 min + 5 Q&A)



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