



2017 PROJECT PEER REVIEW

U.S. DEPARTMENT OF ENERGY
BIOENERGY TECHNOLOGIES OFFICE



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NATIONAL LABORATORY ABBREVIATIONS

ANL	Argonne National Laboratory
BNL	Brookhaven National Laboratory
INL	Idaho National Laboratory
LANL	Los Alamos National Laboratory
LBNL	Lawrence Berkeley National Laboratory
LLNL	Lawrence Livermore National Laboratory
NETL	National Energy Technology Laboratory
NREL	National Renewable Energy Laboratory
ORNL	Oak Ridge National Laboratory
PNNL	Pacific Northwest National Laboratory
SNL	Sandia National Laboratories
SRNL	Savannah River National Laboratory

WELCOME MESSAGE

Dear Project Peer Review Attendees,

On behalf of the U.S. Department of Energy, I would like to welcome you to the 2017 Bioenergy Technologies Office (BETO) Project Peer Review. This review is critical to the success of our core mission: to partner with national laboratories, industry, and universities in the research and development of new technologies that will help accelerate the commercialization of an advanced bioenergy and bioproducts industry. Once realized, these technologies will transform our nation's abundant biomass resources into high-performing biobased fuels, power, and products.

This year's review will feature 183 projects across nine key technology areas, representing a combined value of more than \$200 million from Fiscal Years 2016 and 2017. We believe in the importance of accountability and in being responsible stewards of taxpayer dollars. BETO actively manages our projects for the best possible outcomes, and the Peer Review is an invaluable opportunity for external stakeholders to rigorously evaluate the technical approach, progress, relevance, and overall merit of all the projects in the BETO portfolio.

Thank you to our reviewers and members of the Steering Committee for participating in this year's review. The 47 reviewers and steering committee members represent industry, academia, nonprofit organizations, and government. These reviewers include some of the most experienced and knowledgeable experts in the bioenergy community, and we look forward to their analysis and recommendations for our Office's future direction.

We rely on the reviewers and members of the Steering Committee to provide an overall assessment of the focus and scope of each technology area, and we welcome their recommendations for strategic direction. Results of the 2017 BETO Project Peer Review will inform programmatic decision making and impact future budget and funding opportunity decisions. These results will be published in the 2017 Peer Review Final Report, which will be available to the public.

Results of the Project Peer Review will be presented during the Program Management Review on July 13, 2017, in Arlington, Virginia. The Program Management Review will be open to the public and will immediately follow our annual conference—Bioeconomy 2017: Domestic Resources for a Vibrant Future—which will take place July 11–July 12, at the Pentagon City Sheraton.

We thank you for your interest!

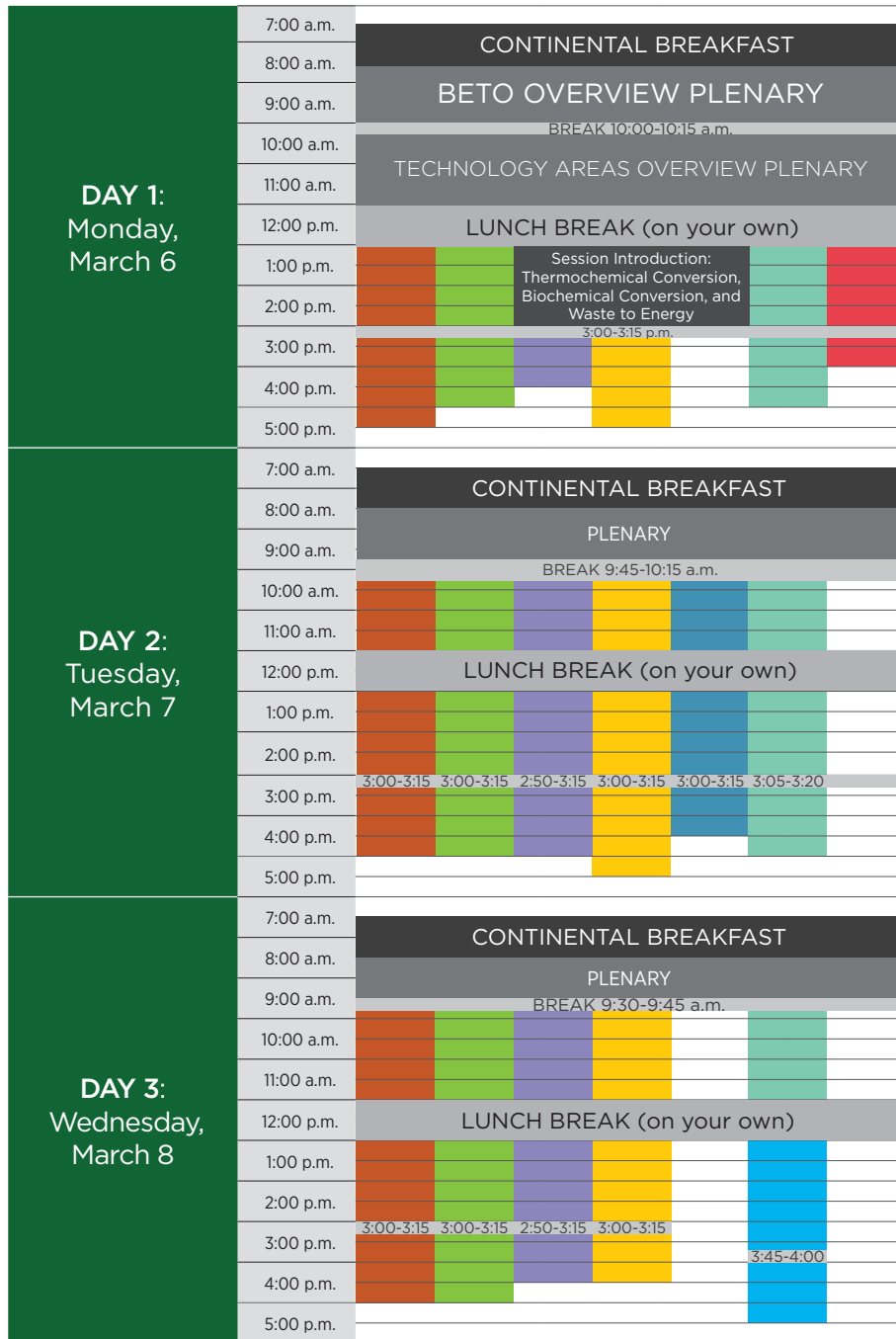
Yours sincerely,



Jonathan Male

Director, Bioenergy Technologies Office
Energy Efficiency and Renewable Energy

AGENDA AT A GLANCE



- REGISTRATION
Grand Ballroom 1 Foyer
- PLENARY SESSIONS
Grand Ballroom 1
- FEEDSTOCK SUPPLY AND LOGISTICS
Tower Court D
- ADVANCED ALGAL SYSTEMS
Directors Row I
- THERMOCHEMICAL CONVERSION
Directors Row E
- BIOCHEMICAL CONVERSION
Directors Row H
- WASTE TO ENERGY
Tower Court C
- ANALYSIS AND SUSTAINABILITY
Windows
- DEMONSTRATION AND MARKET TRANSFORMATION
Tower Court C
- CO-OPTIMIZATION OF FUELS AND ENGINES
Windows
- FEEDSTOCK-CONVERSION INTERFACE CONSORTIUM
Tower Court D

<p>DAY 4: Thursday, March 9</p>	7:00 a.m.	CONTINENTAL BREAKFAST				
	8:00 a.m.					
	9:00 a.m.					
	10:00 a.m.	BREAK 10:00-10:15 a.m.				
	11:00 a.m.					
	12:00 p.m.	LUNCH BREAK (on your own)				
	1:00 p.m.					
	2:00 p.m.					
	3:00 p.m.	3:00-3:15	2:40-3:15		3:05-3:20	
	4:00 p.m.					
	5:00 p.m.					

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PLENARY SESSION AGENDA

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	Presentation Topic	Presenter
8:30 a.m.	8:40 a.m.	BETO Peer Review Introduction	<i>Nichole Fitzgerald</i>
8:40 a.m.	9:00 a.m.	Office of Energy Efficiency and Renewable Energy Sustainable Transportation Overview	<i>Reuben Sarkar</i>
9:00 a.m.	9:20 a.m.	BETO Overview	<i>Jonathan Male</i>
9:20 a.m.	9:40 a.m.	Strategic Plan	<i>Valerie Reed</i>
9:40 a.m.	10:00 a.m.	Analysis and Sustainability Program Overview	<i>Alicia Lindauer</i>
10:00 a.m.	10:15 a.m.	BREAK	
10:15 a.m.	10:35 a.m.	Feedstock Supply and Logistics Program Overview	<i>Alison Goss Eng</i>
10:35 a.m.	10:55 a.m.	Advanced Algal Systems Program Overview	<i>Alison Goss Eng</i>
10:55 a.m.	11:35 a.m.	Conversion Program Overview	<i>Kevin Craig</i>
11:35 a.m.	11:55 a.m.	Demonstration and Market Transformation Program Overview	<i>Liz Moore</i>
12:00 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)	

Day 2: TUESDAY, MARCH 7, 2017

START TIME	END TIME	Presentation Topic	Presenter
8:30 a.m.	9:30 a.m.	2016 Billion-Ton Report: Overview and Sensitivity Analysis	<i>Kristen Johnson; Mark Elless; Laurence Eaton</i>
9:45 a.m.	10:15 a.m.	BREAK	

Day 3: WEDNESDAY, MARCH 8, 2017

START TIME	END TIME	Presentation Topic	Presenter
8:30 a.m.	9:00 a.m.	BETO Communications: Portfolio Overview	<i>Sheila Dillard</i>
9:00 a.m.	9:15 a.m.	Alternative Aviation Fuels: Initiative Overview	<i>Zia Haq</i>
9:15 a.m.	9:30 a.m.	Billion-Ton Bioeconomy: Initiative Overview	<i>Alison Goss Eng</i>
9:30 a.m.	9:45 a.m.	BREAK	

TECHNOLOGY AREA REVIEW SESSION AGENDA

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	FEEDSTOCK SUPPLY AND LOGISTICS		
		Presentation	Organization	Presenter
1:00 p.m.	1:30 p.m.	Feedstock Supply and Logistics: Session Introduction	BETO	Alison Goss Eng
1:30 p.m.	3:00 p.m.	Research, Extension, and Educational Programs on Biobased Energy Technologies and Products	North-Central Regional Sun Grant Center, South Dakota State University	Vance Owens
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	4:00 p.m.	Research, Extension, and Educational Programs on Biobased Energy Technologies and Products (continued)	North-Central Regional Sun Grant Center, South Dakota State University	Vance Owens
4:00 p.m.	4:45 p.m.	Supply Forecasts and Analysis	ORNL	Matthew Langholtz
4:45 p.m.	5:15 p.m.	Resource Mobilization	INL	Patrick Lamers
5:15 p.m.	5:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 2: TUESDAY, MARCH 7, 2017

10:15 a.m.	10:45 a.m.	U.S.-India Consortium for Development of Sustainable Advanced Lignocellulosic Biofuels Systems	University of Florida	Wilfred Vermerris
10:45 a.m.	11:15 a.m.	Renewable Enhanced Feedstocks for Advanced Biofuels and Bioproducts	Yield10 Bioscience	Oliver Peoples
11:15 a.m.	11:30 a.m.	Introduction to Idaho National Laboratory Bioenergy Program	INL	Kevin Kenney
11:30 a.m.	12:00 p.m.	Biomass Engineering	INL	Bill Smith
12:00 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	2:00 p.m.	South Dakota State University, Sun Grant Initiative, Regional Biomass Feedstock Development Partnership	South Dakota State University	Vance Owens
2:00 p.m.	2:30 p.m.	Development of a Wet Logistics System for Bulk Corn Stover	INL	Lynn Wendt
2:30 p.m.	3:00 p.m.	Size Reduction, Drying, and Densification of High-Moisture Biomass	INL	Jaya Shankar Tumuluru
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Multi-Scale Physical and Structural Particle Mechanics	INL	Tyler Westover

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Day 2: TUESDAY, MARCH 7, 2017

START TIME	END TIME	FEEDSTOCK SUPPLY AND LOGISTICS		
		Presentation	Organization	Presenter
3:45 p.m.	4:15 p.m.	Advanced Feedstock Preprocessing	INL	Vicki Thompson
4:15 p.m.	4:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 3: WEDNESDAY, MARCH 8, 2017

9:45 a.m.	10:15 a.m.	Biomass Feedstock Library	INL	Victor Walker
10:15 a.m.	10:45 a.m.	Biomass Feedstock User Facility	INL	Quang Nguyen
10:45 a.m.	11:00 a.m.	Introduction to Fiscal Years 2009 and 2013 Logistics Funding Opportunity Announcements	BETO	Steven Thomas
11:00 a.m.	11:30 a.m.	Design and Demonstration of an Advanced Agricultural Feedstock Supply System for Lignocellulosic Bioenergy Production	FDC Enterprises, Inc.	Kevin Comer
11:30 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Demonstration of an Advanced Supply Chain for Lower-Cost, Higher-Quality Biomass Feedstock Delivery	FDC Enterprises, Inc.	Kevin Comer
1:30 p.m.	2:00 p.m.	Next-Generation Logistics Systems for Delivering Optimal Biomass Feedstocks to Biorefining Industries in the Southeastern United States	University of Tennessee	Timothy Rials
2:00 p.m.	2:30 p.m.	Improved Advanced Logistics Utilizing Woody and Other Feedstocks in the Northeast and Pacific Northwest	The Research Foundation for the State University of New York (SUNY)/ SUNY College of Environmental Science and Forestry	Timothy Volk
2:30 p.m.	3:00 p.m.	Waste to Wisdom: Utilizing Forest Residues for the Production of Bioenergy and Biobased Products	Humboldt State University	Han-Sup Han
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Clean Energy Manufacturing Analysis Center	NREL	Mary Bidy
3:45 p.m.	4:15 p.m.	Feedstock Supply Modeling	ORNL	Erin Webb
4:15 p.m.	4:45 p.m.	Feedstock Supply Chain Analysis	INL	David Thompson
4:45 p.m.	5:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	ADVANCED ALGAL SYSTEMS		
		Presentation	Organization	Presenter
1:00 p.m.	1:30 p.m.	Advanced Algal Systems: Session Introduction	BETO	Daniel Fishman
1:30 p.m.	2:00 p.m.	Microalgae Analysis	PNNL	Mark Wigmosta
2:00 p.m.	2:30 p.m.	Algal Biofuels Techno-Economic Analysis	NREL	Ryan Davis
2:30 p.m.	3:00 p.m.	Major Nutrient Recycling for Sustained Algal Production	SNL	Todd Lane
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Sustainable Development of Algae for Biofuel	ORNL	Rebecca Efroymson
3:45 p.m.	4:15 p.m.	Integration of Nutrient and Water Recycling for Sustainable Algal Biorefineries	University of Toledo	Sridhar Viamajala
4:15 p.m.	4:45 p.m.	Algae Polyculture Conversion and Analysis	SNL	Ryan W. Davis
4:45 p.m.	5:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 2: TUESDAY, MARCH 7, 2017

10:15 a.m.	10:30 a.m.	Advanced Algal Systems: Session Introduction	BETO	Daniel Fishman
10:30 a.m.	11:00 a.m.	Algae Feedstocks Logistics and Handling	INL	Lynn Wendt
11:00 a.m.	11:45 a.m.	Development of Algal Biomass Yield (ABY) Improvements in an Integrated Process (ABY 1 & 2)	Global Algae Innovations, Inc.	David Hazlebeck
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Algae Biotechnology Partnership	NREL	Michael Guarnieri
1:30 p.m.	2:00 p.m.	The Greenhouse: A Comprehensive Knowledge Base of Algal Feedstocks	LANL	Shawn Starkenburg
2:00 p.m.	2:30 p.m.	Genetic Blueprint of Microalgae Carbon Productivity	LBNL	Igor Grigoriev
2:30 p.m.	3:00 p.m.	Algae Biotechnology and Bioengineering	LANL	Scott Twary
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Breeding Algae for Long-Term Stability and Enhanced Biofuel Production	LANL	Richard Sayre
3:45 p.m.	4:15 p.m.	Multi-Scale Characterization of Improved Algae Strains	LANL	Taraka Dale

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Day 2: TUESDAY, MARCH 7, 2017

START TIME	END TIME	ADVANCED ALGAL SYSTEMS		
		Presentation	Organization	Presenter
4:15 p.m.	5:00 p.m.	Algae DISCOVER Project: Development of Integrated Screening, Cultivar Optimization, and Validation Research	<i>PNNL, LANL, SNL, and NREL</i>	<i>Michael Huesemann</i>
5:00 p.m.	5:30 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 3: WEDNESDAY, MARCH 8, 2017

9:45 a.m.	10:15 a.m.	Algal Biomass Valorization	<i>NREL</i>	<i>Lieve Laurens</i>
10:15 a.m.	10:45 a.m.	Bioconversion of Algal Carbohydrates and Proteins to Fuels	<i>SNL</i>	<i>Ryan W. Davis</i>
10:45 a.m.	11:15 a.m.	Algal Biomass Conversion	<i>NREL</i>	<i>Philip Pienkos</i>
11:15 a.m.	11:45 a.m.	Thermochemical Interface	<i>PNNL</i>	<i>Daniel Anderson</i>
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Producing Transportation Fuels via Photosynthetically Derived Ethylene	<i>NREL</i>	<i>Jianping Yu</i>
1:30 p.m.	2:00 p.m.	Algae Production CO ₂ Absorber with Immobilized Carbonic Anhydrase	<i>Global Algae Innovations, Inc.</i>	<i>David Hazlebeck</i>
2:00 p.m.	2:30 p.m.	Atmospheric CO ₂ Capture and Membrane Delivery	<i>Arizona State University</i>	<i>Bruce Rittmann</i>
2:30 p.m.	3:00 p.m.	Microalgae Biofuels Production on CO ₂ from Air	<i>PNNL</i>	<i>Michael Huesemann</i>
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Regional Algal Feedstock Testbed Partnership	<i>University of Arizona</i>	<i>Kimberly Ogden</i>
3:45 p.m.	4:15 p.m.	Algae Testbed Public-Private Partnership (ATP ³)	<i>Arizona State University</i>	<i>John McGowen</i>
4:15 p.m.	4:45 p.m.	Algae Technology Educational Consortium	<i>NREL</i>	<i>Cindy Gerk</i>
4:45 p.m.	5:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 4: THURSDAY, MARCH 9, 2017

8:30 a.m.	9:00 a.m.	Advanced Algal Systems: Session Introduction	<i>BETO</i>	<i>Christy Sterner</i>
9:00 a.m.	9:30 a.m.	Direct Photosynthetic Production of Biodiesel by Growth-Decoupled Cyanobacteria	<i>Arizona State University</i>	<i>Wim Vermaas</i>
9:30 a.m.	10:00 a.m.	A Novel Platform for Algal Biomass Production Using Cellulosic Mixotrophy	<i>Arizona State University</i>	<i>Peter Lammers</i>
10:00 a.m.	10:30 a.m.	BREAK		

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Day 4: THURSDAY, MARCH 9, 2017

START TIME	END TIME	ADVANCED ALGAL SYSTEMS		
		Presentation	Organization	Presenter
10:30 a.m.	11:00 a.m.	Continuous Biological Protection and Control of Algal Pond Productivity	LLNL	Michael Thelen; Rhona Stuart
11:00 a.m.	11:30 a.m.	Integrated Pest Management for Early-Detection Algal Crop Production	University of California, San Diego	Robert Pomeroy
11:30 a.m.	12:00 p.m.	Realization of Algae Potential	Arizona State University	Peter Lammers
12:00 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Biomass Productivity Technology Advancement toward a Commercially Viable, Integrated Algal Biomass Production Unit	Sapphire Energy	Craig Behnke
1:30 p.m.	2:00 p.m.	Advancing Commercialization of Algal Biofuels through Increased Biomass Productivity and Technical Integration	Cellana	David Anton; Babetta Marrone
2:00 p.m.	2:30 p.m.	Scale-Up of Algal Biofuel Production Using Waste Nutrients	California Polytechnic State University	Tryg Lundquist
2:30 p.m.	3:00 p.m.	Integrated Low-Cost and High-Yield Microalga Biofuel Intermediates Production	MicroBio Engineering	John Benemann
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Production of Biocrude in an Advanced Photobioreactor-Based Biorefinery	Algenol	Ronald Chance
3:45 p.m.	4:15 p.m.	Producing Algae for Coproducts and Energy (PACE)	Colorado School of Mines	Richard Sayre
4:15 p.m.	4:45 p.m.	Marine Algae Industrialization Consortium (MAGIC): Combining Biofuels and High-Value Bioproducts To Meet Renewable Fuel Standards	Duke University	Zackary Johnson; Mark Huntley
4:45 p.m.	5:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	THERMOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
1:00 p.m.	3:00 p.m.	Conversion: Session Introduction (Including Thermochemical, Biochemical, and Waste to Energy)	BETO	Kevin Craig
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Analysis and Sustainability Interface	PNNL	Susanne Jones
3:45 p.m.	4:15 p.m.	Thermochemical Conversion Platform Analysis	NREL	Michael Talmadge
4:15 p.m.	4:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 2: TUESDAY, MARCH 7, 2017

9:45 a.m.	10:00 a.m.	BREAK		
10:00 a.m.	10:15 a.m.	ChemCatBio Overview	NREL and PNNL	Joshua Schaidle
10:15 a.m.	11:00 a.m.	Catalytic Upgrading of Biochemical Intermediates	NREL, ORNL, LANL, and PNNL	Richard Elander
11:00 a.m.	11:30 a.m.	Liquid Fuels via Upgrading of Indirect Liquefaction Intermediates	PNNL and NREL	Daniel Ruddy
11:30 a.m.	12:00 p.m.	Fast Pyrolysis and Upgrading	ORNL and PNNL	Alan Zacher
12:00 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Catalytic Fast Pyrolysis	PNNL and NREL	Joshua Schaidle
1:30 p.m.	2:00 p.m.	Recovering and Upgrading Biogenic Carbon in Biomass-Derived Aqueous Streams	PNNL and NREL	Karl Albrecht
2:00 p.m.	2:20 p.m.	Advanced Catalyst Synthesis and Characterization	ANL, NREL, and ORNL	Susan Habas
2:20 p.m.	2:50 p.m.	Catalyst Cost Model Development	NREL and PNNL	Frederick Baddour
2:50 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	4:00 p.m.	Computational Consortium for Physics and Chemistry	ORNL, ANL, PNNL, NREL, and NETL	James Parks
4:00 p.m.	4:30 p.m.	Electrochemical Methods for Upgrading Pyrolysis Oils	INL, PNNL, and ANL	Tedd Lister
4:30 p.m.	5:00 p.m.	Melt-Stable Engineered Lignin Thermoplastic: A Printable Resin	ORNL	Amit Naskar
5:00 p.m.	5:30 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 3: WEDNESDAY, MARCH 8, 2017

9:45 a.m.	10:15 a.m.	Integration and Scale-Up + Total Cost Capital Equipment	NREL	Esther Wilcox
10:15 a.m.	10:35 a.m.	Brazil Bilateral – NREL Petrobras Cooperative Research and Development Agreement (CRADA)	NREL	Helena Chum

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Day 3: WEDNESDAY, MARCH 8, 2017

START TIME	END TIME	THERMOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
10:35 a.m.	10:55 a.m.	Future Work on Refinery Integration	BETO	Liz Moore
10:55 a.m.	11:25 a.m.	Development and Standardization for Bio-Oil Characterization Techniques	NREL and PNNL	Jack Ferrell
11:25 a.m.	11:55 a.m.	Biomass-Derived Pyrolysis Oil Corrosion Studies	ORNL	James Keiser
11:55 a.m.	1:20 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:20 p.m.	1:50 p.m.	Advanced Membrane Separations To Improve Efficiency of Thermochemical Conversion	ORNL and NREL	Michael Hu
1:50 p.m.	2:00 p.m.	Active Funding Opportunity Announcement Overview	BETO	BETO Staff
2:00 p.m.	2:30 p.m.	Fractional Multistage Hydrothermal Liquefaction of Biomass and Catalytic Conversion into Hydrocarbons	Virent, Inc.	Andrew Held
2:30 p.m.	2:50 p.m.	Liquefaction of Agricultural and Forest Biomass to "Drop-In" Hydrocarbon Biofuels	Iowa State University of Science and Technology	Robert Brown; Lysle Whitmer
2:50 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Tetrahydrofuran (THF) Co-Solvent Biomass Fractionation to Catalytic Fuel Precursors with High Yields	University of California, Riverside	Charles Cai
3:45 p.m.	4:15 p.m.	One-Step High-Yield Production of Fungible Gasoline, Diesel, and Jet Fuel Blend Stocks from Ethanol without Added Hydrogen	Vertimass, LLC.	John Hannon
4:15 p.m.	4:35 p.m.	Renewable Hydrogen Production from Biomass Pyrolysis Aqueous Phase	ORNL	Abhijeet Borole
4:35 p.m.	5:05 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 4: THURSDAY, MARCH 9, 2017

8:30 a.m.	9:00 a.m.	Catalytic Processes for Production of a,w-diols from Lignocellulosic Biomass	University of Wisconsin	George Huber
9:00 a.m.	9:30 a.m.	Catalytic Upgrading of Thermochemical Intermediates to Hydrocarbons	Research Triangle Institute	David Dayton
9:30 a.m.	9:50 a.m.	A Hybrid Catalytic Route to Fuels from Biomass Syngas	LanzaTech, Inc.	Sarah Ye
9:50 a.m.	10:10 a.m.	Catalytic Upgrading of Thermochemical Intermediates to Hydrocarbons: Conversion of Lignocellulosic Feedstocks	Virent, Inc.	Andrew Held
10:10 a.m.	10:30 a.m.	BREAK		

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Day 4: THURSDAY, MARCH 9, 2017

START TIME	END TIME	THERMOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
10:30 a.m.	11:00 a.m.	Novel Electro-Deoxygenation Process for Bio-Oil Upgrading	<i>Ceramatec</i>	<i>Elango Elangovan</i>
11:00 a.m.	11:20 a.m.	Improved Hydrogen Utilization and Carbon Recovery for Higher Efficiency Thermochemical Bio-Oil Pathways	<i>Research Triangle Institute</i>	<i>David Dayton</i>
11:20 a.m.	11:50 a.m.	Fractionation and Catalytic Upgrading of Bio-Oil	<i>University of Oklahoma</i>	<i>Daniel Resasco</i>
11:50 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Catalytic Conversion of Cellulosic or Algal Biomass plus Methane to Drop-In Hydrocarbon fuels and Chemicals	<i>Gas Technology Institute</i>	<i>Terry Marker</i>
1:30 p.m.	1:50 p.m.	Building Blocks from Biocrude: High-Value Methoxyphenols	<i>Research Triangle Institute</i>	<i>Ofei Mante</i>
1:50 p.m.	2:10 p.m.	Biomass Gasification for Chemicals Production Using Chemical Looping Techniques	<i>The Ohio State University</i>	<i>Andrew Tong</i>
2:10 p.m.	3:10 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	BIOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
1:00 p.m.	3:00 p.m.	Conversion: Session Introduction (<i>Including Thermochemical, Biochemical, and Waste to Energy</i>)	BETO	Kevin Craig
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	4:15 p.m.	Agile Biomanufacturing Foundry	LBNL, Ames Laboratory, ANL, INL, LANL, NREL, ORNL, PNNL, and SNL	Nathan Hillson
4:15 p.m.	5:15 p.m.	Separations Consortium	ANL, INL, LANL, LBNL, NREL, ORNL, PNNL, and SNL	Jennifer Dunn
5:15 p.m.	5:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 2: TUESDAY, MARCH 7, 2017

10:15 a.m.	10:45 a.m.	Biochemical Platform Analysis Project	NREL	Ryan Davis
10:45 a.m.	11:15 a.m.	Targeted Microbial Development	NREL	Michael Himmel
11:15 a.m.	11:45 a.m.	Enzyme Engineering and Optimization (Targeted Conversion Research - Rational Design)	NREL	Michael Himmel
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Biochemical Process Modeling and Simulation	NREL	Michael Crowley
1:30 p.m.	2:00 p.m.	Biological Upgrading of Sugars	NREL	Gregg Beckham
2:00 p.m.	2:30 p.m.	Lignin Utilization	NREL	Gregg Beckham
2:30 p.m.	3:00 p.m.	Synthetic Metabolic Pathways for Bioconversion of Lignin Derivatives to Biofuels	ORNL	Adam Guss
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Biological Lignin Depolymerization	NREL and SNL	Gregg Beckham
3:45 p.m.	4:15 p.m.	Biochemical Process Integration Bench Scale	NREL	Nancy Dowe
4:15 p.m.	4:45 p.m.	Biochemical Process Pilot-Scale Integration	NREL	Daniel Schell
4:45 p.m.	5:15 p.m.	Separations Development and Application	NREL	James McMillan
5:15 p.m.	5:45 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

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Day 3: WEDNESDAY, MARCH 8, 2017				
START TIME	END TIME	BIOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
9:45 a.m.	10:15 a.m.	Analytical Methods Development and Support	<i>NREL</i>	<i>Edward Wolfrum</i>
10:15 a.m.	10:45 a.m.	Advanced Biofuels Process Demonstration Unit	<i>LBNL</i>	<i>Todd Pray</i>
10:45 a.m.	11:15 a.m.	Fungal Genomics – Genetics (formerly: Fungal Genomics)	<i>PNNL</i>	<i>Jon Magnuson</i>
11:15 a.m.	11:45 a.m.	Advanced Supervisory Control and Data Acquisition for Biochemical Process Integration (with Bend)	<i>PNNL</i>	<i>James Collett</i>
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Developing Thermoascus Aurantiacus as a Thermophilic Fungal Platform for Industrial Production of Cellulases	<i>LBNL and PNNL</i>	<i>Steven Singer</i>
1:30 p.m.	2:00 p.m.	Biological Conversion of Thermochemical Aqueous Streams	<i>NREL</i>	<i>Gregg Beckham</i>
2:00 p.m.	2:30 p.m.	Low-Energy Magnetic Field Separation Using Magnetic Nanoparticle Solid Adsorbents	<i>ANL</i>	<i>Philip Laible</i>
2:30 p.m.	3:00 p.m.	Lignocellulose Conversion to Hydrocarbon Fuels – Deconstruction	<i>PNNL</i>	<i>Michael Lilga</i>
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:30 p.m.	Active Funding Opportunity Announcement Overview	<i>BETO</i>	<i>Jay Fitzgerald</i>
3:30 p.m.	4:00 p.m.	Renewable Carbon Fibers Consortium	<i>NREL, INL, and ORNL</i>	<i>Adam Bratis</i>
4:00 p.m.	4:30 p.m.	Biomass Conversion to Acrylonitrile Monomer – Precursor for Production of Carbon Fibers	<i>Southern Research</i>	<i>Amit Goyal</i>
4:30 p.m.	5:00 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		
Day 4: THURSDAY, MARCH 9, 2017				
8:30 a.m.	9:00 a.m.	Engineering Thermophiles To Produce Drop-In Fuels from Syngas	<i>Kiverdi</i>	<i>Steven Yannone</i>
9:00 a.m.	9:30 a.m.	Engineering Clostridia for N-Butanol Production from Lignocellulosic Biomass and CO ₂	<i>The Ohio State University</i>	<i>Shang-Tian Yang</i>
9:30 a.m.	10:00 a.m.	Production of High-Oil, Transgene-Free Camelina Sativa Plants	<i>Yield10 Bioscience</i>	<i>Kristi Snell</i>
10:00 a.m.	10:15 a.m.	BREAK		

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Day 4: THURSDAY, MARCH 9, 2017

START TIME	END TIME	BIOCHEMICAL CONVERSION		
		Presentation	Organization	Presenter
10:15 a.m.	10:45 a.m.	Continuous Membrane-Assisted Isopropanol, n-Butanol, and Ethanol (IBE) Fermentation from American Value-Added Pulping Cellulosic Sugars	<i>American Process Inc.</i>	<i>Theodora Retsina</i>
10:45 a.m.	11:05 a.m.	Maximizing Multi-Enzyme Synergy in Biomass Degradation in Yeast	<i>J. Craig Venter Institute</i>	<i>Yo Suzuki</i>
11:05 a.m.	11:25 a.m.	SynTec – Synthetic Biology for Tailored Enzyme Cocktails	<i>Novozymes, Inc.</i>	<i>Sarah Teter</i>
11:25 a.m.	11:45 a.m.	Design and Optimization of Biochemical/Biofuel Production with Biosensor-Guided Synthetic Evolution	<i>Lygos, Inc.</i>	<i>Eric Steen</i>
11:45 a.m.	12:05 p.m.	Synthetic Microorganisms To Enable Lignin-to-Fuel Conversion	<i>Texas A&M AgriLife Research</i>	<i>Joshua Yuan</i>
12:05 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:20 p.m.	Upgrading Lignin-Containing Biorefinery Residues for Bioplastics	<i>Texas A&M University</i>	<i>Joshua Yuan</i>
1:20 p.m.	1:40 p.m.	Integrated Process for Commercial Production of Farnesene from Domestic Lignocellulosic Feedstock	<i>Amyris</i>	<i>Quinn Mitrovich</i>
1:40 p.m.	2:00 p.m.	Bio-Syngas to Fatty Alcohols as a Pathway to Fuels	<i>Dow Chemical Company</i>	<i>Devon Rosenfeld</i>
2:00 p.m.	2:20 p.m.	Fermentation Production of Tricarboxylic Acid Cycle (TCA)-Derived Chemicals Using Cellulosic Sugars	<i>Lygos, Inc.</i>	<i>Jeffrey Dietrich</i>
2:20 p.m.	2:40 p.m.	Development of a Sustainable Green Chemistry Platform for Production of Acetone and Downstream Drop-In Fuel and Commodity Products Directly from Biomass Syngas via a Novel Energy-Conserving Route in Engineered Acetogenic Bacteria	<i>LanzaTech, Inc.</i>	<i>Sean Simpson</i>
2:40 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:35 p.m.	Second-Generation Mixotrophy for Highest-Yield and Least-Expensive Biochemical Production	<i>White Dog Labs</i>	<i>Shawn Jones</i>
3:35 p.m.	3:55 p.m.	Process Intensification for the Reduced Commercial CAPEX of Biofuels Production Using Dynamic Metabolic Control	<i>Duke University</i>	<i>Michael Lynch</i>
3:55 p.m.	4:15 p.m.	Improving Tolerance of Yeast to Lignocellulose-Derived Feedstocks and Products	<i>Massachusetts Institute of Technology</i>	<i>Felix Lam</i>
4:15 p.m.	5:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	WASTE TO ENERGY		
		Presentation	Organization	Presenter
1:00 p.m.	3:00 p.m.	Conversion: Session Introduction (<i>Including Thermochemical, Biochemical, and Waste to Energy</i>)	BETO	Kevin Craig

Day 2: TUESDAY, MARCH 7, 2017

10:00 a.m.	10:15 a.m.	Waste to Energy: Session Introduction	BETO	David Babson
10:15 a.m.	10:45 a.m.	Waste to Energy: Feedstock Evaluation and Biofuels Production Potential	NREL and PNNL	Anelia Milbrandt
10:45 a.m.	11:15 a.m.	Waste-to-Energy Simulation Model	NREL	Daniel Inman
11:15 a.m.	11:45 a.m.	Hydrothermal Processing of Biomass	PNNL	Justin Billing
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:30 p.m.	Enhanced Anaerobic Digestion	ANL	Meltem Urgun-Demirtas
1:30 p.m.	2:00 p.m.	Electrochemical Monitoring of Anerobic Digestion	SRNL and ANL	Charles Turick
2:00 p.m.	2:30 p.m.	Biogas to Liquid Fuels and Chemicals Using a Methanotrophic Microorganism	NREL	Michael Guarnieri
2:30 p.m.	3:00 p.m.	Biogas Valorization: Development of a Biogas-to-Muconic Acid Bioprocess	NREL	Michael Guarnieri
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Biomass Electrochemical Reactor for Upgrading Biorefinery Waste to Industrial Chemicals and Hydrogen	Ohio University	John Staser
3:45 p.m.	4:15 p.m.	Lactic Acid Producing Methanotrophic Bacteria for Fermentation of Bio-Methane as a Biological Upgrading Technology	NatureWorks, LLC.	Kenneth Williams
4:15 p.m.	5:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	ANALYSIS AND SUSTAINABILITY		
		Presentation	Organization	Presenter(s)
1:00 p.m.	1:30 p.m.	Analysis and Sustainability: Session Introduction	BETO	Kristen Johnson; Alicia Lindauer
1:30 p.m.	2:10 p.m.	Bioenergy Sustainability: How To Define and Measure It	ORNL	Virginia Dale
2:10 p.m.	2:30 p.m.	2016 Billion-Ton Report, Volume 2: Environmental Sustainability Effects of Select Scenarios from Volume 1	ORNL	Rebecca Efroymsen
2:30 p.m.	3:00 p.m.	Impact of Projected Biofuel Production on Water Use and Water Quality	ANL	May Wu
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Forecasting Water Quality and Biodiversity	ORNL	Yetta Jager
3:45 p.m.	4:15 p.m.	Biofuel Air Emissions Analysis	NREL	Daniel Inman
4:15 p.m.	4:35 p.m.	Bioenergy Knowledge Discovery Framework	ORNL	Aaron Myers
4:35 p.m.	5:05 p.m.	Pathways toward Sustainable Bioenergy Feedstock Production in the Mississippi River Watershed	University of Minnesota	Jason Hill
5:05 p.m.	5:35 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 2: TUESDAY, MARCH 7, 2017

10:15 a.m.	10:55 a.m.	The Greenhouse gases, Regulated Emissions, and Energy use in Transportation Model (GREET) Development and Biofuel Pathway Research and Analysis	ANL	Michael Wang
10:55 a.m.	11:25 a.m.	Carbon Cycling, Environmental and Rural Economic Impacts of Collecting and Processing Specific Woody Feedstocks in Biofuels	Consortium for Research on Renewable Industrial Materials	Steve Kelley
11:25 a.m.	12:05 p.m.	Systems Analysis and Modeling	NREL	Emily Newes
12:05 p.m.	1:05 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:05 p.m.	1:35 p.m.	Biofuels Information Center	NREL	Kristi Moriarty
1:35 p.m.	2:05 p.m.	Strategic Analysis Support	NREL	Mary Biddy
2:05 p.m.	2:35 p.m.	Biofuels National Strategic Benefits Analysis	ORNL	Paul Leiby
2:35 p.m.	3:05 p.m.	Refinery Integration	PNNL and NREL	Susanne Jones; Mary Biddy
3:05 p.m.	3:20 p.m.	BREAK		
3:20 p.m.	3:50 p.m.	Clean Energy Manufacturing Analysis Center: Market Analysis of Biomass-Based Chemicals Substitutions	NREL	Mary Biddy

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Day 2: TUESDAY, MARCH 7, 2017

START TIME	END TIME	ANALYSIS AND SUSTAINABILITY		
		Presentation	Organization	Presenter(s)
3:50 p.m.	4:20 p.m.	Bioeconomy Analysis	ORNL	Laurence Eaton
4:20 p.m.	4:45 p.m.	Bioproducts Transition System Dynamics	NREL	Emily Newes
4:45 p.m.	5:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 3: WEDNESDAY, MARCH 8, 2017

9:45 a.m.	10:15 a.m.	Land-Use Change Data and Analysis	ORNL	Nagendra Singh
10:15 a.m.	10:45 a.m.	Global Change Assessment Model (GCAM) Bioenergy and Land-Use Modeling	PNNL	Marshall Wise
10:45 a.m.	11:15 a.m.	Collaborations To Assess Land Effects of Bioenergy	ORNL	Keith Kline
11:15 a.m.	11:45 a.m.	National Renewable Energy Laboratory International Sustainability	NREL	Helena Chum
11:45 a.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	5:15 p.m.	Break for Co-Optima Review Session (<i>located in Windows room</i>)		

Day 4: THURSDAY, MARCH 9, 2017

8:30 a.m.	9:00 a.m.	Biomass Production and Nitrogen Recovery	ANL	Cristina Negri
9:00 a.m.	9:30 a.m.	Integrated Landscape Management	INL	Shyam Nair
9:30 a.m.	10:15 a.m.	Enabling Sustainable Landscape Design for Continual Improvement of Operating Bioenergy Supply Systems	Antares Group, Inc.	Kevin Comer; Tim Clark
10:15 a.m.	10:45 a.m.	Economic Analysis of Risk	INL	Jason Hansen
10:45 a.m.	11:00 a.m.	BREAK		
11:00 a.m.	11:30 a.m.	Optimization of Southeastern Forest Biomass Crop Production: A Watershed-Scale Evaluation of the Sustainability and Productivity of Dedicated Energy Crop and Woody Biomass Operations	North Carolina State University	George Chescheir
11:30 a.m.	12:00 p.m.	Short-Rotation Woody Biomass Sustainability	ORNL	Natalie Griffiths
12:00 p.m.	12:20 p.m.	Resource Assessment of Sustainable Biomass through Forest Restoration	PNNL	Mark Wigmosta
12:20 p.m.	1:20 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:20 p.m.	2:20 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 1: MONDAY, MARCH 6, 2017

START TIME	END TIME	DEMONSTRATION AND MARKET TRANSFORMATION		
		Presentation	Organization	Presenter
1:00 p.m.	1:30 p.m.	Demonstration and Market Transformation: Session Introduction	<i>BETO</i>	<i>Borka Kostova</i>
1:30 p.m.	2:00 p.m.	Fire Standards Codes and Prevention in Integrated Biorefineries (IBRs)	<i>ORNL</i>	<i>Erin Webb</i>
2:00 p.m.	2:30 p.m.	Renewable Acid-Hydrolysis Condensation Hydrotreating (REACH) Pilot Plant	<i>Mercurius Biorefining</i>	<i>Karl Seck</i>
2:30 p.m.	3:00 p.m.	Launch of an Integrated Bio-refinery with Eco-sustainable and Renewable Technologies in Y2009 (LIBERTY)	<i>POET</i>	<i>Mike Dishman</i>
3:00 p.m.	3:15 p.m.	BREAK		
3:15 p.m.	3:45 p.m.	Bio-Oil Deployment in the Home Heating Market	<i>BNL</i>	<i>Thomas Butcher</i>
3:45 p.m.	4:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 3: WEDNESDAY, MARCH 8, 2017

START TIME	END TIME	CO-OPTIMIZATION OF FUELS AND ENGINES		
		Presentation	Organization	Presenter
1:00 p.m.	1:30 p.m.	Co-Optima: Session Introduction	BETO	Alicia Lindauer
1:30 p.m.	2:15 p.m.	Co-Optima Overview	NREL, ANL, INL, LANL, LBNL, ORNL, PNNL, and SNL	John Farrell
2:15 p.m.	3:45 p.m.	High-Performance Fuels	PNNL, INL, LANL, LBNL, NREL, ORNL, PNNL, and SNL	Daniel Gaspar
3:45 p.m.	4:00 p.m.	BREAK		
4:00 p.m.	4:30 p.m.	Analysis of Sustainability, Supply, Economics, Risk and Trade (ASSERT)	ANL, INL, LBNL, NREL, and PNNL	Jennifer Dunn
4:30 p.m.	5:00 p.m.	Market Transformation	ANL, INL, NREL, and ORNL	Doug Longman
5:00 p.m.	5:15 p.m.	Wrap-Up and Future Directions	PNNL, NREL, ANL, INL, LANL, LBNL, ORNL, and SNL	John Holladay
5:15 p.m.	6:15 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Day 4: THURSDAY, MARCH 9, 2017

START TIME	END TIME	FEEDSTOCK-CONVERSION INTERFACE CONSORTIUM		
		Presentation	Organization	Presenter
8:30 a.m.	8:45 a.m.	Feedstock-Conversion Interface Consortium: Session Introduction	BETO	Steven Thomas
8:45 a.m.	9:15 a.m.	Strategic Plan	INL and NREL	Magdalena Ramirez-Corredores; Edward Wolfrum; Kevin Kenney; Richard Elander
9:15 a.m.	9:40 a.m.	Feedstock Interface	INL, NREL, and PNNL	Daniel Carpenter
9:40 a.m.	10:05 a.m.	Feedstock - Process Interface and Biochemical Blended Feedstock Development	NREL and INL	Allison Ray
10:05 a.m.	10:35 a.m.	BREAK		
10:35 a.m.	11:00 a.m.	Development and Process Intensification of Ionic Liquid-based Lignocellulosic Conversion Process	SNL and LBNL	Seema Singh

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Day 4: THURSDAY, MARCH 9, 2017

START TIME	END TIME	FEEDSTOCK-CONVERSION INTERFACE CONSORTIUM		
		Presentation	Organization	Presenter
11:00 a.m.	11:25 a.m.	Mixed Feedstock Conversion Screening To Develop and Scale Efficient Integrated Processing through Product Transformation	<i>LBNL and SNL</i>	<i>Deepti Tanjore</i>
11:25 a.m.	11:50 a.m.	Biomass Feedstock Library	<i>INL</i>	<i>Victor Walker</i>
12:00 p.m.	1:00 p.m.	LUNCH BREAK (ON YOUR OWN)		
1:00 p.m.	1:25 p.m.	Feedstock Characterization, Performance, and Development	<i>INL</i>	<i>Magdalena Ramirez-Corredores</i>
1:25 p.m.	1:50 p.m.	Advanced Feedstock Preprocessing	<i>INL</i>	<i>Vicki Thompson</i>
1:50 p.m.	2:15 p.m.	Multi-Scale Physical and Structural Particle Mechanics	<i>INL</i>	<i>Tyler Westover</i>
2:15 p.m.	2:40 p.m.	Pretreatment and Process Hydrolysis - Pretreatment	<i>NREL</i>	<i>Melvin Tucker</i>
2:40 p.m.	3:05 p.m.	Feedstock Supply Chain Analysis	<i>INL</i>	<i>David Thompson</i>
3:05 p.m.	3:20 p.m.	BREAK		
3:20 p.m.	3:45 p.m.	Biomass Feedstock User Facility	<i>INL</i>	<i>Quang Nguyen</i>
3:45 p.m.	4:10 p.m.	Feedstock Supply Modeling	<i>ORNL</i>	<i>Erin Webb</i>
4:10 p.m.	4:35 p.m.	Biochemical/Thermochemical Platform Analyses/Analysis and Sustainability Interface	<i>NREL and PNNL</i>	<i>Susanne Jones; Mary Biddy</i>
4:35 p.m.	5:35 p.m.	REVIEWER/LEAD REVIEWER DEBRIEFING		

Peer Review Panels and Steering Committee

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Danielle Sexton	Harris Group
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CO-OPTIMIZATION OF FUELS AND ENGINES

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Philip Marrone	Leidos
F. Michael McCurdy*	Leidos
Candace Wheeler	General Motors (Retired)

FEEDSTOCK-CONVERSION INTERFACE CONSORTIUM

NAME	AFFILIATION
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Emily Heaton	Iowa State University
Philip Marrone	Leidos
F. Michael McCurdy	Leidos
Luca Zullo	VerdeNero, LLC.

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