

**Chemical Conversion via Modular Manufacturing: Distributed, Stranded, and Waste Feedstocks
Workshop Agenda**

Revised: October 28, 2015

NOTE: Speakers and panelist not yet confirmed are listed as invited.

December 2 - Evening

- 4:00 pm Welcome/Introductions (**Accepted:** John Holladay, PNNL)
Review of Workshop I (**Accepted:** Robert Brown, ISU)
Workshop Objectives/Guiding Principles/Big Idea Concept (**Accepted:** Cynthia Jenks, Ames Laboratory)
- 4:30 pm Panel Discussion: What are Federal Agencies Planning in this Area?
(**Accepted:** Jonathan Male, DOE-EERE-BETO **Invited:** DOE-EERE-AMO; USDA; NSF-ENG-CMMI; DOD-AF)
- 5:30 pm Keynote State-of-Technology Presentations
- Expert presentation on modular manufacturing (**Accepted:** Mark Gaalswyk, Easy Energy Solutions)
 - Hydrocarbon conversion at reduced scales
 - Market Realities/Project Finance/Applications (**Accepted:** Brian Baynes, Flagship Ventures)
- 7:00 pm Keynote Dinner Speaker— Biomass Sources, Characteristics, and Challenges
(**Accepted:** Bruce Rittmann, Arizona State University)

December 3 - Morning

- 8:00 am Moderated Panel Discussion: Federal agency drivers, including feedstocks, logistics, products (**Moderator:** Mark Petri, **Invited Panelists:** DOE-EERE-BETO; DOE-EERE-AMO; ARPA-E; NSF-ENG-CMMI; DOD)
- 9:00 am Keynote: Economics of Waste Conversion
- 9:30 am BREAK
- 9:50 am Panel Discussion: Feedstock issues, including feedstock preparation, feedstock logistics, feedstock separation, experts on waste, residues, stranded gas (**Invited:** USDA; **Accepted:** Thomas Tarka, NETL; **Accepted:** Kevin Kenney, INL; **Accepted:** Chuck Hamstra, City of Phoenix)
- 10:40 am Breakout session expectations
- 10:50 am Moderated Group Breakout Session 1
- Topic Area 1: Discuss and recommend 2-4 target feedstocks based on overall impact and technical feasibility or economical difficulty (**Moderator:** Robert Brown; **Scribe:** Jill Euken)
 - Topic Area 2: Discuss modular chemical processing and identify (**Moderator:** John Holladay; **Scribe:** Mark Wright)
 - Scaling inflection points (size of process),
 - Manufacturing inflection points (number of units),
 - Manufacturing technology needs
 - Topic Area 3: Discuss advantages and disadvantages for possible products, including crude intermediate, chemical intermediate, finished fuels, etc. (**Moderator:** Mark Petri; **Scribe:** Cynthia Jenks)
- 11:40 am Present results of breakout sessions and discuss

December 3 – Afternoon

- 12:15 pm Box Lunch while en route to Roeslein/Red Bud for optional tour of Roeslein & Associates Facilities
- 1:15 pm Presentations and tour of Roeslein ([Accepted](#): Rudi Roeslein, Roeslein & Associates)
- 4 pm Return to hotel
- 5:00 pm Social hour
- 6:00 pm Dinner
- 7:00 pm After Dinner Speaker—Manufacturing scaling economics, include emerging manufacturing technologies that may impact current economics or feasibility ([Accepted](#): Jack Hu, Michigan)

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December 4 – Morning

- 8:00 am Technical Challenges Presentations and Discussions (speakers to discuss pre-selected conversion areas)
- Steam reforming, solvent liquifaction (**Accepted**: John Holiday, PNNL)
 - GTL (**Accepted**: Dane Boysen, GTI)
 - Pyrolysis (**Accepted**: Robert Brown, ISU)
 - Fermentation (**Accepted**: LanzaTech)
 - Anaerobic digestion (**Accepted**: Jan Allen, Impact Bioenergy)
 - Discuss why this would work
 - Barriers to technology
 - Technical holes that national labs and universities should be focusing on
 - Barriers to implementation
 - Commonalities to barriers
 - Best approaches
- 9:30 am BREAK
- 9:50 am Instructions for table discussions
- 9:55 am Table discussions about appropriate conversion technologies for selected feedstocks (include emerging technologies that may impact current economics or feasibility)
- Discuss engineering paradigm shift for designing for modularity
 - Opportunities for process intensification and modularization for various technologies
 - Identify technology needs to reduce cost of manufacturing process equipment, process intensification components, skid components, and module assembly
- 10:45 am Table discussion session sharing
- 11:30 am Wrap-up and discussion of next steps
LUNCH
- 1:00 pm Workshop concludes