INTERNAL ARS SCIENTISTS BREAKOUT SESSION I
Break out group name: **CONVERSION AND COPRODUCTS**
Facilitator BILL ORTS
Recorder KEVIN HICKS

- **Identify problem areas (to a large extent non-overlapping and mutually exclusive) for Action Plan**

1. Need for cost effective processes for Thermochemical Conversion of Cellulosics/Biomass/Animal Wastes to Energy and CoProducts
Locations: Wyndmoor, Florence, Corvallis, Beltsville, Albany, Bushland, BioChar/Soil: Mandan, Ames,

A. Need Scalable Technologies; B. Identification of Key crop traits for thermochemical feedstock. C. Need cost effective methods for Feedstock processing: densification/ drying/size reduction, etc. D. Optimizing Process Technologies including Pyrolysis and Gasification. E. Upgrading/ clean-up of pyro-oil and syn gas and hydrogen. F. Chemical or biochemical conversion of pyro-oil or syn gas to energy and coproducts (biochar). G. Integration into biochemical process. I. Demonstration Projects. J. Economic and Life Cycle Analysis.

2. Need better processes for Biochemical Conversion of feedstocks to Energy/Fuels
Locations: Albany, Madison, Brookings, Wyndmoor, Peoria, Winter Haven, Athens, Bushland

A. Starch to Ethanol and Butanol
***Need improved quality and end uses for Distiller's Grains: P,S, Fiber, Fat, Compositional variability due to varied processes, Consistency, Flowability, other Value Added Uses; Real-Time Analysis; Standards?; Mycotoxins; Antibiotics; Improve value of feeds for monogastrics through pre- and post-fermentative processes.**
***Need Improved processes for corn to ethanol: Develop new coproducts by altering production process (granular starch-hydrolyzing enzymes, etc); Dry and Wet Prefractionation of corn prior to fermentation; Water saving processing technologies; Decreased energy and cost technologies; Utilization of corn fiber and germ in processes; Improved enzymes and biocatalysts.**
***Need to evaluate regionally specific alternative Starch-based Feedstocks: Sorghum, Wheat, Barley (especially hull-less), and others.**
B. Need cost effective technologies for converting Cellulose to Ethanol and Butanol
***Pretreatments, saccharification, fermentation, product enrichment and recovery, coproducts, inhibitors, biocatalysts, process economics, process consolidation and integration, fundamental understanding of cell wall structure.**
***Feedstocks-related issues: on-farm or at plant pretreatment technologies**
*** Identification of Key crop traits for best feedstock**
*** Reduction of water usage – treatment recycle!!**
*** Feedstock processing: densification/ drying/size reduction, etc**
C. Need economic processes for conversion of animal wastes by anaerobic digestion and utilization of resulting sludge.
D. New economic processes for Bio Hydrogen production

3. Need to evaluate potential integration of biochemical and thermochemical processes within the biorefinery.
Location: Albany, Wyndmoor, Peoria, Corvallis, Florence,

4. Need for process and economic analysis and models for cellulosic/thermochemical/starch conversion. Also Life Cycle Analysis. Wyndmoor, Albany, Madison, Peoria, Corvallis.

5. Crosscutting Major Issues:
A. Coproducts (from all feedstocks) - Peoria, Athens, Wyndmoor, Madison, Albany, Brookings,
B. Pilot Plant Scale ups facilities – Wyndmoor, Albany, Peoria
C. Need to determine bioconversion potential of Region-Specific Feedstocks
D. SEND MORE MONEY!!! All locations.