

Technology Summary for the USDA grant to CEBC

April 2011

The Center for Environmentally Beneficial Catalysis (CEBC) at KU is a multi-disciplinary research center with expertise in the fields of chemical process innovation, catalysis and reactor engineering. This includes a main R&D thrust in novel green catalytic systems (catalysts, solvents, reactors and separations).

CEBC's technology platform is **chemo-catalytic** (using metal-based catalysts) rather than the **bio-catalytic** platform (using enzymes) used by most of today's biofuels plants. Since the CEBC technology has many common elements of petroleum-refining, it has the potential to generate a wide spectrum of new biochemicals and biofuels. CEBC's vision is for these new biorefining technologies to complement existing biofuels and crop processing facilities in rural areas.

The USDA grant to the CEBC/ADM team represents one major research initiative at KU. Additionally, CEBC is conducting research in areas such as: bio-oils upgrading, platform chemicals from sugars and alcohols from syngas. These represent additional potential for developing new biorefining technologies that can be commercialized in rural areas. CEBC plans to pursue additional R&D funds from federal agencies and industry to support these additional product targets.

Targeted Biomass Feedstocks

Targeted biomass feedstocks include lignin, cellulose, sugars and oils derived from non-food biomass derived from crop residue and specialty energy crops such as:

- Corn stover
- Sorghum
- Soybean stover
- Switch grass
- Wheat straw

Potential Products

- 1,4 butane diol
- 1,3 propane diol
- Methacrylic acid
- 2,5 Furan dicarboxylic acid
- Azelaic acid
- Aromatics (toluene, mixed xylenes)
- Plasticizer alcohol
- Butanol and mixed alcohols

These biochemicals will be further refined to produce higher value products such as plastics, packaging materials, synthetic fibers and consumer products (laundry detergents, bathroom cleaners and beauty products). In addition to these biochemicals, the technology will support development of advanced biofuels.

Kansas Locations

These biorefining technologies are in the early stages of development and will need to go through a “pilot plant to commercial plant scale-up” process. KU is implementing a strategy to evaluate the necessary biomass feedstocks, necessary industrial infrastructure and location of markets for these biochemicals. This analysis will be applied to the Kansas agribusiness industry to identify industry segments and locations that could be initially considered as candidates for commercializing these biochemicals. These could include existing:

- Biofuels plants
- Milling operations
- Biomass storage and grain elevators

Contact

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