



**January 30, 2013**

## **The NABC Holds its Third Annual Consortium-Wide Meeting**

The members of the National Advanced Biofuels Consortium met in Phoenix, Arizona, on January 16 and 17 to discuss Stage II results to date and plan the final year of the three-year project whose goal is to develop technology to produce renewable drop-in transportation fuels. The group is more than halfway through the two-stage project, which focuses on R&D of different strategies to produce fuels including fermentation, chemical catalysis, hydrolysis, and hydrothermal liquefaction. This meeting was the fourth consortium-wide event; the first, a pre-award organizational meeting, was held in early 2010, and two annual meetings were held in January 2011 and 2012.

Attendance included staff from 15 of the 17 partners with more than 50 participants.

The first day opened with a general session devoted to reviewing the Stage II highlights and accomplishments of the consortium including talks from the four strategy teams, the Fundamentals & Modeling team, and the Refinery Integration team. The strategy teams and some cross-cutting teams met to hold in-depth technical discussions and share data and results. These face-to-face meetings built on the regular monthly Web and teleconference call each team holds in addition to sub-team calls for specific topics such as catalyst testing and economic analysis.

A dinner held the first evening, hosted by Amyris, BP, Pall, RTI, Virent, and NREL, provided an opportunity for networking and continuing discussions.

On the second day, the full consortium met to hear a series of excellent presentations by a panel of invited experts in commercializing pyrolysis oil at conventional refineries, the future of biobased chemicals, and corrosion issues associated with advanced biofuels.

### **Commercializing Pyrolysis Oil at Conventional Refineries: Possible Path Forward and Next Steps**

Stephen V. Arbogast     Executive Professor, C.T. Bauer College of Business, University of Houston  
J. David Paynter       Retired, ExxonMobil

*This presentation summarized research done on the full value chain costs for manufacturing and upgrading pyrolysis oil into products suitable for blending into conventional refined motor gasoline and diesel fuels. It then reported on promising preliminary results from working with "Partially Upgraded Pyrolysis Oil" and outlined a research path to confirm and extend this initial work.*

### **What is the Future of Biobased Materials?**

Brent H. Shanks         Mike and Jean Steffenson Professor, Director of the NSF Engineering Research Center for Biorenewable Chemicals (CBiRC), Department of Chemical and Biological Engineering, Iowa State University

*Increasingly, companies that are selling directly to consumers are touting products made at least partially from biobased chemicals. However, consumers have repeatedly demonstrated very little willingness to pay any extra for products with biobased content. The current petrochemical production is highly efficient and the feedstock costs are being driven down by the expanding production of shale gas. Against this backdrop, is there a path forward for the introduction of biobased chemicals? To date,*

biobased chemical development has generally been premised on targeting a single biobased chemical at a time. Unfortunately, this serial approach to biobased chemical products is both time intensive and expensive, which are hardly desirable attributes. Are there alternative technological approaches that could mitigate some of the challenges facing biobased chemical development? It is proposed that there is a need to consider development approaches that can create a more generalized framework in which a range of biobased chemicals could be produced from a common technological platform. One such generalized technological framework, being developed by CBiRC, depends on the exploitation of a common metabolic pathway leading to a diversity of intermediate chemicals that are subsequently converted to chemical products using chemical catalysts. An overview of the technical strategy being used by CBiRC to achieve a generalized chemical production platform was discussed as well as several specific examples involving varying chain length carboxylic acids with decarboxylation to olefins and biological-produced pyrones with subsequent ring opening or aromatization.

### Corrosion Issues Associated with Advanced Biofuel Production

Jim Keiser Distinguished Research and Development Staff Member, Oak Ridge National Laboratory

The potential for biomass-derived liquid fuels is well recognized as is the fact that there are issues that will need to be addressed as we work toward the extensive utilization of these fuels. Not the least of these issues is the selection of structural materials for the production, further processing, transportation, and storage of biomass-derived fuels. General observations as well as more thorough laboratory studies have shown that biomass-derived liquids can be quite acidic, and consequently, corrosive to many of the materials that are commonly used for construction of the systems used for processing and handling these biomass-derived materials.

Laboratory corrosion studies have been conducted using untreated, stabilized, and hydrotreated bio-oils, and general corrosion and stress corrosion cracking have been observed in some of these products. These oils have also been analyzed to determine their acid content. Samples exposed in operating systems have been examined, and general and localized corrosion have been seen as well as shallow cracking. This presentation addressed these issues and observations.

The meeting finished with a meeting to discuss opportunities for future collaboration among the NABC partners. Overall, the meeting provided the opportunity for the consortium members to strengthen relationships, present and discuss results, address key issues, and share their expertise with their teams and the consortium as a whole.

