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SESSION 2
Today's Biorefineries

Introduction to Session 2

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Session 2 focused on the transition from the biorefineries of today to the ones of the future. The various presenters provided an international perspective, offering several visions about how future biorefineries may look, what technologies they will require, and what products they will produce. One recurring high-level theme was the need to logically capitalize on the learning being accrued in our existing grain, sugar, pulp, and other plant biomass processing mills, which represent today's biorefineries. Such facilities are now being used to produce a large number of products, including starches, sugars, oils, fuels, organic acids, polymers, and power. Ethanol and biodiesel production, in particular, are experiencing tremendous growth and are benefiting from increased "critical mass" and significant economies of scale. Biorefineries based on ethanol and biodiesel production provide routes for dramatically increasing the use of renewable resources to supply fuels and chemicals for the global economy.

The first two articles in this session of these proceedings make the case that biorefineries of the future are likely to combine the use of both biochemically and thermochemically based conversion technologies, as well as apply various process intensification strategies, to develop integrated systems that produce fuels and a variety of bio-based chemical and energy products with very high overall efficiency. Kochergin and Kearney discuss the value of incorporating engineered fractal distributors into applicable biorefining separations to dramatically increase their efficiency and throughput. Eggeman and Verser highlight the important role that utility systems play in existing and prospective biorefinery operations, especially in determining

facilities' fossil fuel requirements and efficiencies. The three subsequent articles focus on specific technologies that are likely to be implemented in future biorefineries. Ekenseair and coworkers address the opportunities to extract high value products such as flavonoids from biomass before it is processed into fuels and chemicals to help to improve overall process profitability. Etoc and colleagues report on the development of simplified procedures for screening antifoams for their efficacy in controlling foam during gas sparged fermentations (e.g., aerobic submerged cultivations). Finally, de Lima da Silva and coworkers report on optimizing production of biodiesel from castor oil.