

# Biorefinery Technologies Maximize The Value Of Renewable Resources

Research Foundation of SUNY



Forest biorefinery is defined as the full conversion of wood biomass into fibers, chemicals and energy. For decades pulp mills have burned or discarded wood sugars and chemicellulose, which can be used in the manufacturing of plastics, ethanol and acetic acid. Now new processes developed at the State University of New York's College of Environmental Science and Forestry (SUNY ESF) in Syracuse make it much easier to exploit these co-products.

A suite of "Forest Biorefinery" technologies were developed by Thomas E. Amidon, Ph.D., Gary M. Scott, Ph.D., Bandaru V. Ramarao, Ph.D., Raymond Francis, Ph.D., Christopher D. Wood and Jeremy Bartholomew. The technologies are designed to extract value from trees in new and unique ways. The Empire State Paper Research Institute was the primary funding source. Wood chips are pretreated with selected enzymes, which make the lignin, sugars, and hemicellulose easier to extract. Once extracted and concentrated, the sugars and hemicellulose are converted to acetic

acid and ethanol, two valuable commodities. This enables pulp mills, chipboard plants and other businesses that utilize trees (or forest biomass) to better extract economic value from their current production processes.

“ *It is estimated that the extracted lignin, sugar and hemicellulose will yield as much revenue from downstream chemical products as the fiber or fuel that is traditionally extracted yields in the production of paper products or energy.*

Acting on behalf of SUNY ESF, The Research Foundation of State University of New York is in the early stages of licensing and commercialization. Licensees and potential licensees are testing these technologies in small-scale pilot operations throughout the country. In 2007 New York State Department of Agriculture and Markets dedicated \$10.8 million to the construction of pilot and demonstration plants in New York, first at SUNY ESF and then transferring the pilot plant to Lyonsdale Biomass, LLC, a wood-burning power plant on the Moose River, Lewis County. The first full-size biorefinery is scheduled for completion in early 2009 in the state of New York.

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