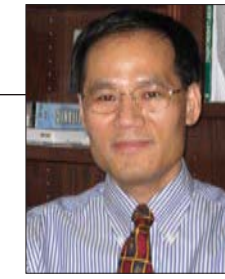
Guest Editorial

J. Y. ZHU | *TAPPI Journal* Editorial Board



Forest biorefinery: The next century of innovation

Editor's Note: *J.Y. Zhu is a scientific leader with the U.S. Department of Agriculture's Forest Service, Forest Products Laboratory in Madison, WI. He is also an adjunct professor in the Department of Biological Systems Engineering at the University of Wisconsin, Madison. A member of the* TJ *Editorial Board, Zhu organized this special issue on the forest biorefinery, which highlights ongoing research at the Forest Products Laboratory.*

– **Monica Shaw**, Editorial Director

The concept of producing cellulosic biofuel, bioproducts, and chemicals using lignocelluloses in a biorefinery has been around for over a century. Renewed interest in the biorefinery concept has more recently arisen from concerns about climate change and the depletion of fossil fuels. Much research and progress has been made in the last three decades in the area of biochemical technology, with many breakthroughs. However, the realization of the biorefinery concept remains a challenge. It is a daunting task to (1) overcome the huge barriers in developing and commercializing new technologies to the scale of several thousand tons of biomass per day, which may take several decades; and (2) to maintain the sustainability of such large scale production using natural resources.

On the other hand, the pulp and paper industry has practiced sustainable green manufacturing of biobased products from forest biomass at a similar capacity for almost a century. The industry has a wealth of experience and history of innovation in producing a variety of products, such as pulp and paper, cellulose derivatives, textile materials, specialty chemicals, and energy. For commercial-scale bioenergy efforts, there are significant benefits and potential shortcuts from riding on the success of the pulp and paper industry, with its mature and efficient production capabilities.

As the key technical resource in the forest products industry, TAPPI sees great opportunities for the industry to be involved with the research and development of technologies for the future forest biorefinery. To this end, *TAPPI Journal* decided to publish special issues in bioenergy and biorefinery research, in addition to research articles on these topics in regular issues.

This particular issue highlights some of the research activities related to the forest biorefinery at the USDA Forest Service, Forest Products Laboratory (FPL), to commemorate the century long service of the laboratory (1910-2010). We will also feature bioenergy research of other Forest Products Research Organizations throughout the world from time to time.

We hope that this special project from *TAPPI Journal* will encourage the biomass and biorefinery scientific community to look to the pulp and paper industry for bioenergy expertise gained through vast knowledge, technology, and human capital developed over the last century — expertise that can strengthen the sustainability of our society. We also hope that the pulp and paper industry can gain from the cutting edge research being carried out throughout world — and be inspired for yet another century of innovation.

The Forest Products Laboratory has a long history of contributions to the forest products industry. At bottom is the University of Wisconsin-Madison building where FPL was founded in 1910 and current home for the Department of Materials Science and Engineering. In the Middle is FPL's main building on the UW-Madison campus, built in 1932. At top is FPL's Centennial Research Facility (CRF), dedicated in 2010.