

BIOREFINERY OPPORTUNITIES FOR FOREST PRODUCTS INDUSTRIES

Alan W. Rudie¹

ABSTRACT

Wood residues offer biorefinery opportunities for new products in our industries including fuel and chemicals. But industry must have two capabilities to succeed with biorefineries. Most forest products companies already have the first capability: knowing where the resource is, how to get it, and how much it will cost. They will need to integrate the acquisition of woody residues for making new products while minimizing competition for valuable timber suitable for dimension lumber and other traditional products. The second capability needed requires companies to look at the overall biorefinery effort and acquire the expertise to move thermal and biochemical conversion of biomass into chemicals with a higher value than ethanol (Rudie 2009). Sugar platform chemicals, those that have glucose as a common intermediate, include ethanol for fuel, ethylene, butadiene, lactic acid used to produce polylactic acids for producing biodegradable plastic to replace polystyrene, and diols used in synthesis of polyesters and other specialty products. The thermo-chemical process first gasifies biomass to produce hydrogen and carbon monoxide and then reforms it into products including diesel or aviation fuel and methanol. The literature on the chemical and biochemical processes for these new products and the likelihood of success was recently reviewed (Rudie 2011). Forest products, including wood-based chemicals and polymers, are well positioned to be carbon neutral, sustainable, and green solutions to global problems (Winandy et al. 2008). Some of these wood-based products do not have large markets and will reward only the first companies willing to invest in their production. Most of these processes cannot be implemented without further research and without risk.

LITERATURE CITED

- Rudie, A.W. 2009. **State of the art in biorefinery in Finland and the United States.** Gen. Tech. Rep. FPL-GTR-185. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.
- Rudie, A.W. 2011. **Opportunities for the forest products industries.** In: Shelly, J. R., ed. Woody biomass utilization: conference proceedings. Madison, WI: Forest Products Society: 3-16.
- Winandy, J.E.; Rudie, A.W.; Williams, R.S.; Wegner, T.H. 2008. **Integrated biomass technologies: future vision for optimally using wood and biomass.** Forest Products Journal. 58(6): 6-16.

¹ Project Leader, U.S. Forest Service, Forest Products Laboratory, One Gifford Pinchot Dr., Madison, WI 53726. To contact author, call 608-231-9496 or email arudie@fs.fed.us.

The content of this paper reflects the views of the author(s), who are responsible for the facts and accuracy of the information presented herein.