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CHALLENGES AND OPPORTUNITIES IN FOREST SERVICE UTILIZATION RESEARCH

I find it convenient to think of wood utilization research at four levels: (1) solid wood products, (2) reconstituted wood, (3) wood fiber, and (4) molecular level. The Forest Service, along with its university and industry collaborators, is currently working at all four levels. Where does publicly supported Forest Service research go from here? My vision, imperfect as it is, suggests the following.

SOLID WOOD PRODUCTS

As the most mature of the four levels, much of solid wood research belongs in the private sector, where process improvement and product development are paramount. There remain a number of key challenges for public research, including improved external and internal defect sensing, better sawing and drying technology (especially for hardwoods), and a number of consumer-related matters such as fire safety and improved grading standards (applies to other levels as well).

RECONSTITUTED WOOD

Here, too, technology is maturing with much of the action in the private sector. The most important challenge, as I see it, is to look at composite materials as an engineered product, where a basic knowledge of the characteristics of chips, glue, veneer, mechanics, and wood chemistry are combined with process variables to produce products of predefined properties.

WOOD FIBER

Impressive gains are being made in forming wood fiber under pressure, heat, and constraint including the Forest Product Laboratory's press-dried paper and "Spaceboard." Needed now is a full-sized press to bring these technologies into commercial reality. This effort is best done in partnership with universities and industry.

MOLECULAR WOOD RESEARCH

Here the Forest Service and other publicly supported research have a large role to play to build on old and new research on the chemical characterization of ligno-cellulosic material and ways to alter it. This research is basic, risky, and long term—normally best addressed by the public sector. But it is here that wood could be converted to chemical feed stocks, to liquid energy when fossil fuels run short, and to a host of other chemical resources. This research must be accelerated now

in order to meet the almost certain needs for chemicals and energy from wood in the next century.

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