

Wood Products

Wood products in our daily lives¹ - No matter where you are this very moment, chances are there's a product made with wood right within your reach. Perhaps it's surprising, but wood products make up 47 percent of all raw materials used in manufacturing in the United States, and that's a good thing. Wood is renewable, beautiful and durable, and its production has significantly less impact on the environment than most other materials.



WOOD = DURABILITY

A prime example of durability is Japan's oldest wooden building. This 122-foot-tall structure, built in 607 A.D., has withstood 46 earthquakes of 7.0 or greater magnitude, and is still standing strong.

A renewable, remarkable resource - Wood's carbon impact is small compared to building materials like concrete and steel. Studies have found that wood performed far better than steel or concrete in residential buildings. Wood also sequesters, or stores, carbon even after harvest, which keeps carbon out of the atmosphere.

Nearly 100 percent of a tree can be used to make wood products or energy; that's nearly every last bit of bark, needle, sap and sawdust. No part of a tree is wasted. In fact, much of the energy used at mills and for manufacturing wood products comes from bioenergy provided by wood.

It takes a tree - Did you know that each person in the United States uses the equivalent of a 100-foot-tall tree every year to meet his or her needs for building, paper, packaging and other products? So much of what we use every day comes from wood. Literally thousands of items are made from wood, and wood products make up 47 percent of all raw materials used in manufacturing in the U.S.

Renewable energy right in our backyard - Woody biomass includes wood, bark and leaves from trees and shrubs and the leftovers from harvesting and milling. All of these extra wood products are processed together and used as fuel. This renewable form of energy is used most often for generating heat and power. Woody biomass is also an innovative material in that it can be used to create adhesives, solvents, plastics, inks and lubricants.

Although using woody biomass does produce carbon dioxide, newly planted trees absorb carbon dioxide from the atmosphere. Because thinning forest stands is an important part of actively managing forests anyway, we wind up with abundant material to create woody biomass. We can responsibly recycle our forests into fossil fuel alternatives, just as our forests recycle carbon dioxide for us.

Woody Biomass Use – Forest Products Laboratory - Forests in the United States contain a substantial amount of small-diameter, overstocked, and underutilized material. The catastrophic wildfires we are seeing in increasing numbers in the western United States are caused in large part by overcrowded forests. Not only do these overstocked stands increase the risk of fire, they are prone to insect, disease, and drought damage.

¹ <http://oregonforests.org/content/k-12-resources>

Thinning these dense, overstocked stands of trees can help reduce the risks mentioned; however, the thinning process can be very costly and may exceed the value of the material removed. Using thinned material to create valuable products is one way to improve the economics of the situation and promote thinning operations that improve forest health.

Since 1993, the Forest Products Laboratory (FPL) has focused some of its research effort on small-diameter and thinning material, identifying potential uses, and providing technology that can help rural-based communities create successful businesses from the by-products of ecosystem management.



Lumber and Newsprint from Forest Thinning² - Our national forests are so overcrowded that the growth of many trees is suppressed. Initial research has shown that small-diameter (suppressed-growth) trees have narrower annual rings, more uniform fiber cell structure within the rings, and a higher volume of mature wood. The pulp and paper industry has become increasingly reliant on availability of residuals from sawmill operations. Less refining energy was required to produce pulp from forest thinning than from conventional wood supplies.

Standing Dead Trees - Cooperative research involving FPL and industry showed that log home manufacturing provides a high-value use for logs cut from standing dead trees killed by insects and wildfires and is an excellent source of local employment.

Small-Diameter Ponderosa Pine - The FPL conducted a study investigating the use of small-diameter ponderosa pine lumber in glued-laminated (glulam) timber members. The objective of this work was to develop an efficient glulam combination utilizing small-diameter ponderosa pine for all laminations. The experimental results suggested the allowable properties of the glulam combinations using two separate lamination grades were generally higher than the currently available single-grade combination in the glulam standard.



Forest Thinnings for Bio-composites - Engineered wood composites are a classic high-value, large-volume use for small-diameter trees and underutilized species. FPL research has developed new engineered composite products and process technologies to manufacture them. This work has shown that suppressed-growth, small-diameter trees from overstocked fire-prone forests can be used to offset costs associated with hazardous-fuels removals.

Summary

These are a few of the examples of how Research and Development (R&D) is being used to find cost-effective uses of the low-valued forest biomass that must be removed from the nation's forests to restore their health and condition. In addition to hazardous fuels reduction, these R&D activities contribute to expanding markets for forest products, providing sustainable benefits to the American public, and restoring, enhancing, and sustaining the nation's forests.

² http://www.fpl.fs.fed.us/research/research_emphasis_areas/introduction.php?rea_id=5