U.S. Endowment Brings Innovation to the Forest Sector

BY MICHAEL GOERGEN

At the U.S. Endowment for Forestry and Communities (Endowment) we are focused on keeping forests as forests and creating family waged jobs in communities that depend upon forests. We believe vibrant and diverse markets are essential to achieve our mission. Most landowners need markets to keep their forests healthy and financially viable.

But markets don't last forever. Buggy whips evaporated with the Model T's emergence on America's roads. Plenty of forest products markets have gone away or are on the decline. Newsprint anyone? At the Endowment we are working to bring innovation to the forest sector and develop new markets, whether traditional or non-traditional, such as finding ways for landowners to get paid for things like water, which they largely provide for free.

When specifically looking at forest products, we see opportunities in areas where there is modest investment and where our resources can make a difference in accelerating market development. A good example is mass timber construction.

In most parts of the US, building codes do not allow wood construction above six stories—a serious limitation. The Endowment and its partners are working to make taller wood buildings reality. We are working with the U.S. Forest Service's Forest Products Laboratory to demonstrate the safety of tall wood construction. From fire testing to earthquake simulations, it has been demonstrated that wood performs as good or better than traditional building materials. We are working to create the opportunity to build up to 18 stories out of wood. Several partners have joined together to showcase this research to the International Code Council, opening new markets for wood and opportunities for foresters to continue managing forests to produce high-quality saw logs. Most cross-laminated timber consists of 2x6 or 2x8 boards of spruce and fir.

While saw logs are important, we know that low-value markets are just as important. The Endowment is making investments in torrefied wood made from low-value wood and residuals (see companion piece by Joe Koerner on page 20).

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U.S. Endowment for Forestry Facts

The U.S. Endowment for Forestry and Communities, Inc. (Endowment) is a not-for-profit corporation established as part of the 2006 Softwood Lumber Agreement (SLA). The Endowment is one of three entities designated to share in a one-time infusion of funds to support "meritorious initiatives" in the US. It has been endowed with $200 million under the terms of the SLA.

The SLA designated three purposes for use of the funds, and the Endowment was charged to advance two of those: (1) Educational and charitable causes in timber-reliant communities; and (2) Educational and public interest projects that address forest management issues that affect timber-reliant communities, or the sustainability of forests as sources of building materials, wildlife habitat, bio-energy, recreation, and other values.

As a perpetual endowment, the $200 million corpus is invested in broad financial markets. If depending only on funds generated from the corpus on an annual basis, $8-10 million/year is available to advance Endowment purposes.

The Endowment targets it funds using filters of seeking systemic, transformative, and sustainable change; moving the needle on seemingly intractable problems where few others will engage; bringing together coalitions of interested parties to address areas of concern; and taking risks to use creative solutions to advance their mission.

Areas of investment concentrate in seven focal initiatives using a market-based approach: retaining and growing traditional markets such as lumber and paper; advancing non-traditional markets like water; innovation and new markets; wood-to-energy; forest retention; forest health; and asset creation (working with disadvantaged populations to broaden the forestry tent).

For more information on the endowment, visit www.usendowment.org.

We are also exploring cellulosic nanomaterials (CN), which can also be made from lower value wood. CN are the basic building blocks of trees and have unique and desirable properties at the nanoscale. A nanometer is very small, about 1/20th the width of a human hair. Strange things happen at the nano scale: gold is actually a pink or red color as a nanoparticle; silver can eliminate odors; and in the case of cellulose, the material has the strength of steel at 1/5th the weight. CN have very promising applications.

PHOTO COURTESY OF MICHAEL GOERGEN

Students at Oregon State University preparing concrete samples from the first full-scale commercial test of cellulose nanomaterial-enhanced concrete.

For example, coating fiberglass with CN can yield a car bumper that is 20% lighter with the same strength. Lighter car parts equal better gas mileage, which is good for consumers and the environment. Packaging can be made stronger and lighter. The viscosity of paints and coatings can be improved. Production of oil and gas wells can be enhanced. The most immediate market appears to be concrete. By adding a small amount of CN to concrete, a stronger product can be developed that reduces CO2 emissions by about 15%.

New, disruptive markets are difficult to open. While adding tiny bits of wood to concrete may seem like it won't make much of a difference, it's important to understand that worldwide 4 trillion tons of concrete are used. We are not trying to replace existing additives in a concrete mix. In fact, by adding CN, manufacturers will be able to use less cement in the concrete mix, saving them money. Even with the many environmental wins from using CN in concrete, it's the cost savings that will accelerate adoption. Disruption that reduces costs is the kind of disruption industry likes.

One of the biggest long-term challenges our industry faces is its lack of investment in innovation. Innovation is expensive, and our sector is not making the investments necessary to keep up. The average investment in research and development in the US manufacturing sector is 3.4% of sales. In the forest sector it is 0.5% of sales. The Endowment's investments cannot make up for this lack of investment. However, we can showcase what is possible and draw attention to assets like the Forest Products Laboratory (FPL) that are in desperate need of reinvestment and reimagination. During World War II, the lab had 725 employees; today, it has just 141, only 50 of whom are researchers. FPL successes and innovations from the 1950s to 1980s are still yielding benefits sustaining today's lifestyles. Without investments made today, what will our future look like? And what are our competitors investing in to replace forest products?

The Endowment is not looking at innovation through the lens of what's possible for the future of the forest products industry. We are thinking about the forest. We believe that markets help keep forests as forests. We invest in the markets of today and tomorrow to ensure that landowners continue to find the value in their forest that encourages management and investment that is so vital to our forestlands. Our efforts today are developing products that ensure that consumers will continue to make forest products their first choice. And those forest products will help us manage and sustain what we have on the land today. ◆

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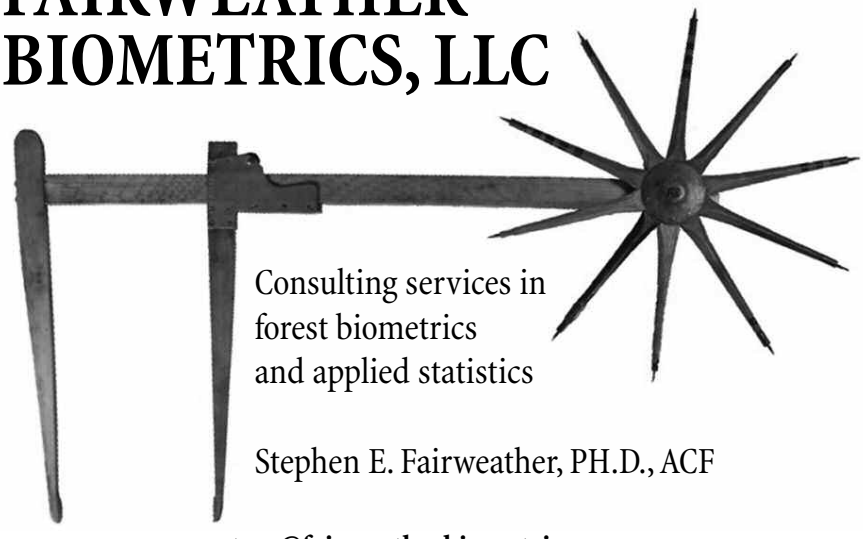

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