

House Appropriations Committee
Interior, Environment, & Related Agencies Subcommittee
Hearing on Innovation in New Wood Products and Markets

March 23, 2021

Good morning Chair Pingree, Ranking Member Joyce, and Members of the Subcommittee. My name is Stephen Shaler, and I am the Director of the School of Forest Resources at the University of Maine, a land, sea and space grant university located in the homeland of the Penobscot Nation. Thank you for the opportunity to testify about increasingly innovative wood products and their growing markets. The intent of my remarks today will be to illustrate the importance of forest-sourced products to rural communities, their role in promoting sustainability, and opportunities for carbon sequestration in wood building materials and other wood products.

The United States is fortunate to have forests covering over 750 million acres (one-third) of the land area. Maine, home to the first sawmill in North America, is the most heavily forested state in the country at 89% of the land area. The health and sustainability of our rural communities is entirely dependent on that of the forest. These forests are the economic heart of many of our rural communities – supporting forest products and outdoor recreation and tourism industries while providing vital habitat for wildlife and improving water and air quality for all life.

We live in a challenging time where the impacts of climate change on forest health is increasingly evident, whether it is through temperature, drought, fire, invasive pests, muddy roads from early thaws and heavy rain events. The need to adapt how we manage these forests depends upon the presence of markets and conversely the ability to meet increased demand for wood products from forest systems requires that the forests be healthy and sustainably managed.

There has been incredible disruption in the forest products industry over the past two decades with the closure of many pulp and paper mills that had long been among the region's largest economic engines and the biggest buyers of wood. But exciting opportunities are emerging that will ultimately diversify, strengthen and sustain the forest economy and the communities dependent

upon it. Accelerating innovation in forest products and their application is key to meeting the increasing global demand for low-carbon materials, chemicals, and fuels that can come from forests. But that innovation must occur within the context of a vibrant, interconnected network of the environment (forest), society (rural communities at the source and increasingly urban global markets at the end), and economy.

An example of a collaboration building on traditional strengths through innovation to shape the future of the forest economy and forest-dependent communities can be found in Maine in the Forest Opportunity Roadmap/Maine project, known as FOR/Maine¹.

FOR/Maine is a unique cross-sector collaboration between industry, communities, government, education, and nonprofits. They have come together to ensure that Maine strategically adapts and capitalizes on changing markets to maintain our leading role in the global forest economy and to support prosperity in our state while sustaining our natural resources. FORMaine evolved from a federal Economic Development Assistance Team (EDAT) initiated in 2016 and is currently funded through the U.S. Economic Development Administration. The University of Maine is proud to play a central role in this effort, serving on FOR/Maine's executive committee and a number of its subcommittees including those focused on emerging technologies, market attraction, workforce development and wood supply analysis. Our research, development and commercialization activities are critical to Maine and the nation's ability to add value to existing forest products and create new ones. We are increasingly seeing demand driven by industry interest for sustainable and renewable feedstocks, which actively managed forests can provide. Since 2016, over \$1.1 billion in CAPEX has been invested in Maine forest industries including pulp and paper, lumber, wood energy and wood composite facilities.

In October 2019, the University of Maine was awarded one of ten University Mass Timber Grants, funded by the U.S. Endowment for Forestry & Communities/U.S. Forest Service to support demonstration projects showcasing mass timber technologies on university campuses. The

1. <https://formaine.org>

project helped to support the conceptual design, engineering and pricing of a cross-laminated Timber (CLT) laboratory facility. To capture the full carbon picture of the project, a preliminary cradle to grave, whole building life cycle assessment was performed to examine the material carbon impact from structural and architectural elements in the timber design. The study highlighted that material sourcing is a key driver of embodied carbon and that storage of biogenic carbon in wood building materials is a clear positive attribute for the life of the structure.

The opportunities for wood product innovation in the building space extend beyond load-bearing solutions. The use of low-grade biomass and/or mill residuals (waste) for low-density wood-fiber insulation materials is one example. Wood fiber insulation (WFI), is currently being imported into the U.S., but high shipping costs have kept it an expensive niche product. Active collaboration with emerging domestic manufacturers in Maine are projecting WFI to be a cost-neutral, drop-in replacement for petroleum-based insulation boards, such as extruded/expanded polystyrene foam.

A final example is the \$1.49M investment by the USFS to build a pilot plant for production of cellulose nanofibrils (CNF) as part of a joint venture in 2011. Since inception, the University of Maine¹ has shipped cellulose nanomaterials, including those produced at the Forest Products Laboratory, to 50 countries, 305 companies, and 276 universities to support R&D and product development. Though global in reach, 60% of the samples have gone to U.S.-based organizations.

Through the involvement of dedicated people, hard work, and resulting global collaboration, the University of Maine has become a globally recognized center of excellence for the production and application of cellulose nanomaterials. It also supports a local community of UMaine researchers and startups using cellulose nanofibers in a wide variety of applications including adhesives, foams, packaging, building materials, and even bones. Many of these will replace products made with petroleum products.

1. <https://umaine.edu/nanocellulosevalley/>

To summarize, collaborations involving industry, government (local, state, federal and international), universities, and local communities are central to leveraging the maximum impact of wood innovation, as is sustained federal investment that fosters that collaboration while supporting research and development.

Thank you again for the opportunity to speak with you today and for your ongoing interest and investment that is sustaining the forest economy and the communities and citizens dependent upon it.