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WORKING LANDS ENTERPRISE INITIATIVE
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Agriculture, Food & Markets
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Assessment of *Local Wood, Local Good,* Certification Systems & Vermont Sourced Wood

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Introduction

The Working Lands Enterprise Board (WLEB) is conducting a systems analysis of Vermont's Forestry Industry to identify opportunities for strategic investments to support and grow this important sector of Vermont's economy. The goals of this work are to identify the most promising opportunities and build relationships within the sector (and beyond) that contribute to prosperity for all participants. As part of this work Yellow Wood has explored the role of "*Local Wood, Local Good*," certification systems, a Vermont brand, and demand for locally sourced wood in Vermont's forestry and wood products industry. This exploration focused on potential contributions to the advancement of the value chain market opportunities identified in this project (Furniture and Solid Wood Products, Construction, Wood Energy and Enhancing the Economic Value of Vermont's Woodlands). The information in this document is based on findings from secondary research, key informant interviews with businesses working in Vermont's forestry and wood products sector, an online survey of industry participants (with 175 responses), four regional focus groups and a series of value chain workshops. In addition to secondary research, this document reflects the beliefs and perceptions of a diverse group of people and businesses in the forestry and wood products industry from across the state.

This document is divided into three sections. The first section discusses the *Local Wood, Local Good* marketing campaign and the recommended next steps for understanding the potential value and implementation of this campaign. The second section describes the current forestry certification systems and findings on their relevance to the industry at this time. This section also looks at the current and potential impact of LEED certification on the industry and the construction value chain in particular. The third section focuses on the demand for Vermont-sourced wood (and wood that can be tracked from forest to product) within the industry.

Local Wood, Local Good

The *Local Wood, Local Good* slogan was developed by the Vermont Wood Manufacturers Association (VWMA) in 2012 in response to a lack of national messaging around wood and wood products similar to "Got Milk," "Beef, It's What's for Dinner," or "Pork. The Other White Meat" — three national branding campaigns for agricultural products. Since its development, VWMA and the Vermont Woodlands Association have worked to advance the message, including producing and distributing several thousand bumper stickers across New England. Kathleen Wanner, Executive Director of the Vermont Wood Manufacturers Association and the Vermont Woodlands Association, describes a national vision for the slogan, in which it would be adopted by organizations nationally, have an impact on consumers' purchasing decisions with respect to wood products and raise awareness of the value of our forestland.¹ While this marketing campaign would benefit businesses in Vermont's forestry and wood products industry it is not intended as a Vermont branding campaign. To date, the message has not been tested (the VWMA membership has embraced the slogan) and no funding has been sought or received for advancing the message at a local, regional or national level.

Before the *Local Wood, Local Good* campaign moves forward, it will be important to understand whether or not the slogan resonates with both consumers and those who would need to invest in its development and ongoing management. Does a *Local Wood, Local Good* campaign make sense at a national level? How many states would be positively impacted? Are there any potential negative consequences to such a campaign? (For example, many hardwood products combine native and non-native species or species that are local to one area but not another.) More work needs to be done to understand how such a campaign would resonate with national organizations such as the American Hardwood Lumber Foundation, the American Forest Foundation, The Hardwood Manufacturer's Association and the National Hardwood Lumbermen's Association. We would also suggest a conversation with the U.S. Forest Service and the U.S. Endowment for Forestry and Communities to discuss this idea and to better understand the initiatives already underway to promote U.S. hardwoods.

If there were industry interest at the national level in supporting a *Local Wood, Local Good* campaign, it would be important to conduct a branding and marketing study for the campaign that would answer questions such as:

- What does *Local Wood, Local Good* mean to consumers (how is it interpreted)?
- How is it likely to impact consumer spending? Will it be more effectively applied to some products and not others?
- What types of activities would be best suited to this type of promotion and who should carry them out?

Once demand for a national campaign and confirmation of the impact of such a campaign on consumer behavior has been established, the industry would need to determine how such a campaign would be funded and managed. One option would be to support this initiative through a checkoff program for the hardwood industry.¹ The "Hardwood Checkoff" is an active initiative being led by a group of hardwood industry leaders in the United States to develop a commodity checkoff program for the hardwood industry. With support from industry leaders and the U.S. Endowment for Forestry and Communities a Hardwood Checkoff steering committee has been developed to pursue the program. In January of 2015 the committee announced they had received permission to move forward from USDA, which will lead to the development of a revised proposal and the required referendum vote to proceed from the industry.^{2,3}

The hardwood checkoff program would join two other checkoff programs in the wood products industry (Softwood Checkoff Program and the Paper and Paper-based Packing Checkoff Program). The U.S. Endowment for Forestry is investigating the feasibility of a Timber Harvesting Checkoff program and Wood-to-Energy Checkoff program.⁴ The description of the

¹ Checkoff programs are established under federal law as commodity research and promotion programs through the USDA. Checkoff programs are funded by the industry and administered by a board or committee with the goal of increasing the success of the businesses that produce and sell certain commodities. For more information on checkoff programs, visit:
<http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateB&leftNav=ResearchandPromotion&page=ResearchandPromotion>

Softwood Checkoff Program below provides some insight into the scope of activities that could be supported by a hardwood checkoff program and the types of groups that might be involved.

Several years ago the U.S. Endowment for Forestry and Communities commissioned a study on the feasibility of using the agricultural “checkoff” program to grow markets for softwood lumber as a result of the 2006 Softwood Lumber Agreement to “advance systemic, transformative and sustainable change for the health and vitality of the nation’s working forests and forest-reliant communities.”⁵ The 2008 report found that a bi-national checkoff program would in fact be feasible and would help resolve trade tensions, grow the market, and improve business conditions for the softwood lumber industry. In 2011 the Binational Softwood Lumber Council (BSLC) established a Blue Ribbon Commission which finalized its proposal to create a softwood lumber checkoff program.⁶ The checkoff program levies an industry assessment of \$0.35/mbf to support marketing and research programs to grow demand. The program is implemented by the Softwood Lumber Board, established “to promote the benefits and uses of softwood lumber products in outdoor, residential and non-residential construction” through programs and initiatives to increase demand for appearance and structural softwood lumber products.⁷

Investments made by the Softwood Lumber Board with money from the checkoff program in 2014 included⁸:

- The **American Wood Council** (www.awc.org): for work on building standards to maintain and expand acceptance of appearance and structural softwood lumber in the marketplace.
- The **National Post Frame Building Association** (www.nfba.org): to promote the acceptance and expand the use of softwood lumber in post frame construction.
- **reTHINK WOOD** (www.rethinkwood.org): to promote the values and benefits of appearance and structural lumber products.
- **WoodWorks** (www.woodworks.org): to grow the market share for appearance and structural softwood lumber in light commercial and multi-family construction.
- **Timber Tower Project**: to research a composite building system for mid and high-rise buildings which relies primarily on softwood lumber products.
- **Appearance Product Promotion Program** (www.woodnaturally.com): to implement a communications program promoting the use of softwood lumber in interior and exterior appearance applications and develop and execute an association partnership program.
- **U.S. Tall Wood Building Prize Competition** (www.tallwoodbuildingcompetition.org): to develop the capacity to construct taller buildings out of wood.

This list illustrates the wide range of efforts that can be supported by a checkoff program to support the common interests of an industry group. All funded projects are required to establish and report on metrics that capture the impact of the funded program on the softwood lumber industry. Broad-based metrics for market development (softwood lumber sales, market share), market retention (lumber sales protected, market share trends) and codes & standards (value of market protected, value of new market opportunities identified) projects are pre-determined by the Softwood Lumber Board and required for funding. While it is too soon to

know the impact of investments made in 2014, within a few more years there may be lessons to be learned regarding impacts from activities associated with the softwood checkoff program.

Before additional investment is made into *Local Wood, Local Good* a consortium of interested parties should be engaged to ensure industry demand at the national level for such a campaign. If VWMA association is interested in a national campaign, it makes sense to begin a dialogue with the Hardwood Checkoff steering committee and its members as well as other potential supporters.

Certification Systems

Forest Certification Systems

Forest certification systems offer a third party verification system that certifies that specific forestry practices related to the growth and harvesting of trees are being followed to ensure that forests are being sustainably managed. Chain of custody certification traces wood from its source through its use in product manufacturing by certifying all the enterprises that handle the wood along the way.

A Brief History

Forest certification programs are a relatively recent phenomenon. The American Tree Farm System (ATFS) was organized in the 1940s as the first certification program dedicated to practicing forest management on a sustainable basis in response to threats of forest fires and government regulation of private forestlands; in the early 2000s ATFS transitioned to family forest owners exclusively and formal ATFS certification with third party verification began in 2009.^{9,10} Forest certification systems as we know them today grew out of the desire, and need, to respond to rapid tropical deforestation in the 1980s and 1990s. In 1993 the voluntary non-profit organization, Forest Stewardship Council (FSC) was launched through the Worldwide Fund for Nature to develop a system for certifying and labeling forests and forest products that met a set of sustainability criteria.¹¹ In 1994 the Sustainable Forestry Initiative (SFI) was launched by the American Forest and Paper Association to promote sustainable forestry practices in the United States.¹²

There are three primary certification systems active in the United States at this time: Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) and American Tree Farm Systems (ATFS). In addition to these three, the Programme for the Endorsement of Forest Certification (PEFC) is an international organization, the endorser/certifier for ATFS; ATFS is the structure for implementing the PEFC standards. The Canadian Standard Association (CSA) is a Canadian system used by some American landowners and companies.

All five of these systems offer Forest Management Certification in which a specific area of forestland is being managed according to the certification guidelines (this certification is applied to landowner/piece of land). Chain-of-custody (CoC) certification, which tracks from the forest to the supply chain to the end user, is offered by FSC, SFI, PEFC and CSA. ATFS wood can be chain-of-custody certified through the SFI and PEFC CoC systems. CoC certification is available to companies that process or sell forest products such as primary and secondary

manufacturers, brokers, distributors, wholesalers and retailers to allow companies to label their wood products as “certified” to end users.

The Role of Certifications by SubSector / Value Chain

“Certification” means different things within different subsectors of the forestry and wood products industry. Though our work over the past seven months — including interviews with more than 30 business owners in the industry, survey resultsⁱⁱ and focus groups held across the stateⁱⁱⁱ — has shown a declining interest in forestry certification across the forestry and wood products industry in Vermont, there are several notable exceptions. These exceptions are described by subsector below.

Furniture and Solid Wood Products

Within the furniture and solid wood products industry FSC certification is the most recognized. However, the Sustainable Furnishings Council (SFC) was established in 2006 as an educational and marketing organization to promote sustainable practices among manufacturers, retailers and consumers. The SFC was established in response to consumer demand for sustainability and offers its own symbol of assurance for customers. The SFC currently has 400 members, including Copeland Furniture of Vermont, and offers LEED training for green furnishings.

Many companies that offer home furnishings (such as Crate and Barrel, West Elm, Copeland Furniture and Room and Board) as well as those providing office furnishings (such as Knoll, Humanscale and Steelcase) identify FSC-certified wood products among their offerings, indicating a response to consumer demand for products that are differentiated by sustainability and/or certification. Vermont furniture and solid wood products manufacturers agreed that currently the consumer is not demanding certified products but that many home and office furnishing companies continue to require that wood furniture, or furniture components like a desk top, they source be FSC certified.

In 2008, the Green Wood Collaborative received funding to examine the “green wood” sector in Vermont and piloted a project that aggregated Vermont-harvested FSC certified wood from small landowners for a new line of certified furniture from Copeland Furniture. Redstart Forestry worked directly with landowners and Allard Lumber to produce the wood needed by Copeland for the project. The project identified five main constraints and recommendations:¹³

1. Existing FSC standards are insufficient and do not represent the “best forest practices...” Project participants recommend a “Vermont FSC” standard that would include pre and post-harvest verification.

ⁱⁱ The Vermont Forestry and Wood Products Sector Survey was administered in the fall of 2014. The online survey received 175 responses (with a 33% response rate) from businesses throughout the forestry and wood products sector in Vermont.

ⁱⁱⁱ Focus groups were held in November and December of 2014 to engage participants in the forestry and wood products sector in discussion about the positive developments, challenges and market opportunities facing the industry. The Focus Groups brought together a variety of perspectives and shared opinions and perceptions of more than 50 participants.

2. There is no entity that aggregates FSC log inventory from multiple landowners in Vermont. Project participants recommend developing a database to manage Vermont FSC standing timber inventory that would include small landowners.
3. Work needs to be done to systematically reach out to small landholders to advocate for certification, assist in the certification process and bundle small landholders to help improve returns.
4. Work with Redstart, Vermont Sustainable Jobs Fund, Allard Lumber and Copeland Furniture demonstrated that multiple firms and organizations working together closely can reduce barriers and help build new markets. More members of the industry need to be engaged.
5. Small landowners operating alone are unlikely to be rewarded in the marketplace. However, bundling small landowners to provide wood to a “Vermont Quality Wood” market may improve returns.

The Green Wood Collaborative experiment coincided with the macro-economic downturn. The Forestry Partnership, serving landowners and foresters providing FSC-certified or locally grown wood in Vermont and New Hampshire, has grown out of the project. The Forestry Partnership, which collectively manages approximately 250,000 acres, sets a third party audited standard for forest management and connects landowners with trees ready for harvest with demand.^{14,15} The constraints and opportunities identified by The Forestry Partnership and the Vermont Green Wood Collaborative should be taken into account before moving forward with value chain development that includes the use of certified, local wood.

Wood Energy

As wood energy continues to make its case as a renewable energy source, some institutions are specifying wood pellets or woodchips from FSC certified woodlots to ensure the sustainability of wood supply. For example, the recently installed wood pellet boiler system at Paul Smith’s College in upstate NY will burn only FSC certified wood pellets (supplied by Curran Renewable Energy in Massena, NY).¹⁶ Wood pellet mills for export and other bioenergy projects are continuing to be built or planned in U.S. coastal areas at a rising pace.

As the demand for pulpwood in the Northeast is expected to increase,¹⁷ wood energy will continue to compete with paper and engineered wood products firms for raw materials. It is important to note that several paper mills in the region, which are often competing with wood energy producers for low-grade wood, are continuing to demand FSC or SFI certification for pulpwood. Some paper mills pay premiums for FSC. Finch Paper in Glens Falls pays a bonus for certified wood. SFI is also accepted by some mills. Most of the paper mills in the Northeast produce a “mixed” certified product, of which around 20-30% of their purchased pulpwood comes from FSC certified lands.

Construction Materials

Sawmills and lumberyards reported there are still a few customers that want FSC lumber and are willing to pay a premium for it (up to 10%), but they are in the minority. Some Vermont firms in the lumber industry reported that wood sells faster if it is not FSC certified. Focus Group participants considered the LEED credits for wood to be a positive development in the

industry and there is a direct connection with a potential construction materials value chain and demand for LEED certification. Massachusetts and New York ranked in the top five states for LEED building in 2014 with 360 projects certified in these two states in 2014. This type of demand for LEED could influence a value chain supplying certified construction materials to the regional building industry. If a construction materials value chain identifies LEED buildings as a market opportunity to pursue, this will require a wide range of certified wood products from structural lumber to millwork and other wood finishes.

Leadership in Energy and Environmental Design (LEED)

LEED certification is a third party verification system that certifies that a building has been built to a standard that reduces energy use and adverse environmental impacts. In the newest version of the LEED certification system (v4), launched in late 2013, applicants can receive credits for the use of certified wood products through the Building product disclosure and optimization — material ingredients. The intent of the credit is: “To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.”¹⁸

Applicants can achieve one credit if the project uses “at least 25%, by cost, of the total value of permanently installed products in the project.” To achieve this credit for wood products, the wood must be certified by the Forest Stewardship Council or USGBC-approved equivalent (of which there are currently none). Products sourced from within 100 miles of the building site are valued at 200% of their base contributing cost (making it easier to meet the 25% value required to achieve the credit).

This is a change from the last iteration of LEED — version 3, 2009, which can be applied through 2016 — in which a credit could be achieved if a minimum of 50% of wood-based materials and products were FSC certified.¹⁹

Demand for LEED

Over the decade, demand for LEED certified buildings has been growing rapidly at colleges and universities and is starting to be required by some state and local governments. The number of federal buildings receiving LEED certification has been increasing steadily over the past few years with a 51% year-over-year increase over the past several years, based on preference by the General Services Administration (GSA) for building to LEED standards.²⁰ The growth in LEED certified buildings on college campuses has been even more significant with 2,078 LEED-certified projects in higher education as of half-way through 2014 and more than 3,000 additional projects seeking certification. The University of Vermont instituted a green building policy in 2005, requiring all new construction and major renovations to use LEED guidelines; in 2007, the policy was upgraded to require a minimum of LEED silver equivalent.²¹

LEED is considered to be non-wood-friendly by many because it allows only FSC-certified wood to qualify (“USGBC-approved equivalent” has not been defined and USGBC has not allowed

other certification systems, such as SFI or ATFS, to be counted). Some states have passed legislation that requires public buildings using the LEED certification system to focus on the local wood credit and not use the certified wood credit as a way of supporting local forestry and wood products industries.²²

Increasing the Economic Value of Vermont's Woodlands

Certifications that apply to landowners, and Vermont's forestland base, include ATFS, FSC and SFI. Studies in the last decade looking at direct costs of forest certification to landowners estimated that costs for forest certification ranged from "\$0.51 per acre to \$3.74 per acre for initial certification, and \$0.25 to \$1.85 per acre per year to maintain certification."²³ Costs per acre were found to be inversely related to land ownership (so that smaller acreage parcels cost more to certify on a per acre basis than larger land parcels).²⁴ Group certification can help reduce both cost and complexity for smaller private landowners. Both the ATFS and FSC offer group certification options; SFI and PEFC do not offer their own group certification but both recognize the ATFS program under their certification.

As we have seen, market signals support certification in selected markets, but not across the board. While certification of forestland can open doors to markets and customers that are seeking certified forest products, the match between products available on specific certified lands and market demand is not a given. Nor is it a given that certified product will command a price premium. There are reasons to become certified other than economic returns, such as improving land management and environmental and social outcomes. However, if the motivation is, at least in part, economic, it is useful to identify the match between available products and market demand in advance of incurring certification costs, recognizing that there will be a time lag between when certification take place and when products are available during which markets may shift. Where there is clearly identified relatively stable demand this may create opportunities for multiple landowners to work together toward a "group certification" which helps small and medium-sized landowners share the cost of certification by sharing some of the administration costs across multiple landowners. It is also important to keep in mind that some studies have found that certification can reduce economic returns to landowners by limiting/reducing the acres available for timber harvest on a certified piece of property.²⁵

The Status of Forestry Certification in Vermont

In 2014, 74,000 acres of Vermont’s forestland was FSC certified, 90,000 acres was SFI certified^{iv} (by two landowners — Plum Creek Timber Company and The Conservation Foundation) and 166,000 acres were certified through the American Tree Farm System. ^{26,27,28} (Combined, this land makes up less than eight percent of Vermont’s 4.5 million acres of forest land.)

The Vermont Forestry and Wood Products Sector Survey found that the majority of survey respondents do not participate in any forestry certification programs with only 36% of businesses reporting that they do participate in a forestry certification program and 17% reporting that they participate in a chain-of-custody certification program.

The highest participation rate in forestry certification programs was by respondents who identified themselves as wood energy producers, with 44% participation, while the lowest rate of participation was in the secondary wood products sector with less than 10% participation (5 out of 53 businesses). On the demand side, fewer than a quarter (23%) of survey respondents reported their customers require forestry or chain of custody certification.

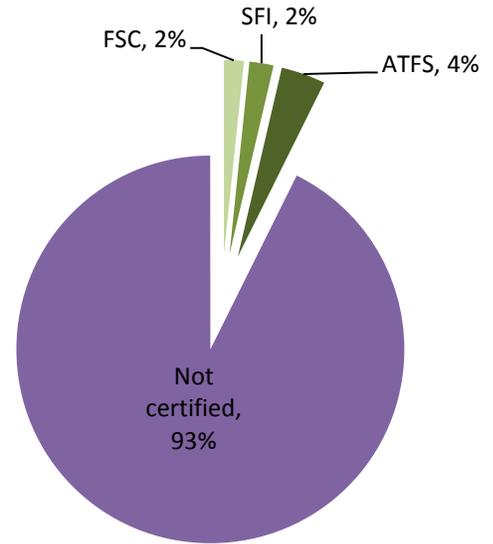


Figure 1: Proportion of Vermont’s forestland that is certified (2014).

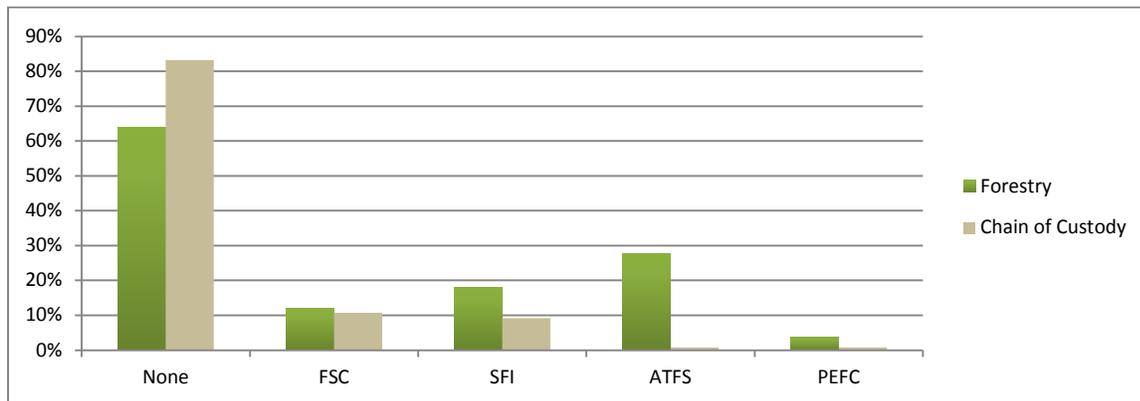


Figure 2: Participation in Forestry and Chain-of-Custody Certification by type of certification (Survey Respondents)

Barriers to Certification for Vermont Firms

When asked about barriers to participation, the majority of survey respondents (55%) reported that the market didn’t justify participation in certification programs; other barriers, in order of importance, included cost to maintain certification (40%), cost to certify (39%) and lack of time (21%).

^{iv} The SFI FM standard is endorsed by PEFC International so this timber could also be sold as PEFC certified fiber.

Vermont Wood

Our work to date has shown very limited interest in Vermont branded wood products. The Vermont Forestry and Wood Products Sector Survey found that just 9% of survey respondents, all of which produce secondary wood products, participate in the “Vermont Quality Wood Products” brand; no entity currently manages the Vermont Quality Wood Products brand and there has never been any enforcement of brand standards. Several respondents reported being members of organizations, such as “Guild of Vermont Furniture Makers” and “Vermont Woodlands Association.” These are both membership organizations (the Guild is a juried membership) and would not be considered brands. Craftspeople and/or landowners join for the benefits they receive from being a member. Less than a third of survey respondents were interested in participating in a state or regional branding initiative, suggesting that a “Vermont” brand for this industry as a whole would not be a good investment at this time.

However, we have heard from secondary producers in Vermont’s wood products industry that there is an interest in, and demand, for wood products that can be traced back to timber harvested in Vermont. Participants in the Furniture and Wood Products Value Chain Workshop stressed the importance of “the story” of the product and/or brand, which is often closely linked to Vermont. This story is also important to many of the businesses producing solid wood construction materials and custom homes for the high-end market. Participants in the Wood Energy Value Chain Workshop stressed the importance of being able to show that wood chips, pellets and firewood are sourced sustainably.

Typically, Vermont wholesalers that buy lumber on the open market do not know how much of it came from trees harvested in Vermont. For many of their customers, this is not a significant issue. However, for Vermont manufacturers and builders seeking to produce and market products from Vermont wood, difficulty identifying the origin of the wood available to them is a barrier. Some manufacturers deal with this by either cutting wood from property they own, arranging to purchase wood that has been chain of custody certified, or verifying its source by communicating directly with loggers or others, but there is no system in place that serves multiple buyers or reduces the transaction costs for secondary processors looking to increase their scale of operations.

A variety of focus group participants expressed an interest in having access to wood that they know has been grown in Vermont. Much of the interest came from secondary manufacturers (ranging from lumber producers, to furniture makers to those serving institutions that are specifying Vermont wood for construction and renovation projects) who have an interest in, and demand for, products that are made from wood sourced in Vermont. Some participants reported they are seeing a trend away from certified wood to locally sourced wood in institutional specifications.

Some participants also identified disconnects between the timber supply, and primary and secondary processing in the Vermont supply chain to be a challenge for their business. For example, often furniture makers can tell the story of how a product was made, but can’t substantiate where the wood comes from. Buyers increasingly want to know from where the wood in the products they buy comes, and if it comes from Vermont that adds to the story that

Vermont producers can tell. Some producers want to be able to say that they're using Vermont material, but there is not a predictable supply.

Some sourcing of Vermont wood is already taking place at some institutions, such as Middlebury College, which has partnered with Vermont Family Forests (VFF) to procure wood for construction of new buildings. The partnership between Middlebury College and VFF meant that 70% of the wood in the new building was sourced from woodlots within 35 miles of campus. The college has gone on to partner with several Vermont-based furniture and cabinet manufacturers to source tables, chairs, couches and cabinets from Vermont wood for other construction and renovation projects.²⁹ The University of Vermont (UVM) has completely changed its thinking on sourcing for construction projects as a result of requiring that all new buildings and major renovations projects be built to LEED standards (which provides credit for locally sourced building materials). The University's Rubenstein School used Vermont wood finishes throughout and has an "informational wall" that tells the story of the wood and how it got into the building. This story wall is a highlight of University tours and helps UVM tell its story as a "green institution" in the green mountain state.³⁰

Institutional demand for Vermont-sourced wood products is real, however they have all resulted from special partnerships or use of wood from the institution's own wood lot, a process with high transaction costs. This confirms that there is not yet a predictable supply of wood to manufacturers looking to work with Vermont-sourced wood products.

Tracking Wood from the Source

Unlike certification, tracking wood to identify its origin in the state can be done without third party verification with a range of technologies ranging from traditional paint markings, to barcoding, to chemical verification (DNA, Isotopic sampling). While many of the most recent technological advances in timber tracking have been developed for those working to mitigate illegal logging, there are many other benefits to tracking wood for supply chain management and origin identification. Some in the maple syrup industry have been tracking syrup from tree to bottle for more than a decade. While this used to be done primarily through paperwork, and was fairly time intensive, many companies now use bar coding or Radio Frequency Identification (RFID) to do this tracking. Dave Marvin of Butternut Mountain Farms reports that his company can trace the origin of syrup in every bottle to the farm it came from in less than four hours. The company hopes to add this information to individual bottles using QR codes so that consumers can do that same tracking with their smart phones to see the farm their syrup came from, responding to demand for more point of origin transparency by consumers.³¹

Technologies

There are currently three main technologies (in addition to paint) used for tracking timber world wide: barcodes, Radio Frequency Identification (RFID) and chemical verification.

Barcodes^{32,33}

Barcodes are attached to timber to provide a unique code that can be scanned and transferred electronically to a timber tracking database. Barcodes are a relatively low-cost technology but the barcodes themselves can become detached and are difficult to maintain after processing when wood from multiple sources is being combined. In addition staples commonly used to

attach bar codes to the timber and even the material the bar code is printed on can contaminate the manufacturing process.

Another barcode tracking system is being developed through the University of Oregon³⁴ using a painted QR code^v and commercially available bar code scanner applications for smart phones. This system uses a QR code stencil and tagging paint (designed for timber and applied with a spray gun). This system removes the issues associated with detachability and contamination of the manufacturing process by staples or plastic tags. Researchers are also experimenting with mixing a microtaggant in the paint (which can only be seen under certain wavelengths of UV light) to protect against tampering.

Radio Frequency Identification (RFID)^{35,36}

RFID includes chips/transponders attached to timber that contain an ID number and other information that is wirelessly transmitted between the tag and a RFID reader. The RFID system is relatively expensive, and application and reading requires trained staff and connection to the internet or a mobile phone network for tracking. A project looking at applicability of RFID for tracking in the Nordic timber supply had success making some adaptations to traditional RFID processes and equipment to track round wood, poles and sawn timber boards. This project found high success rates by ensuring the transponders were inserted into the logs (so as not to be knocked off in processing) and developing transponders made of a material that does not contaminate the pulp wood process. The study found that using external transponder tags on sawn timber was problematic as many of the tags were lost during processing.

Chemical Verification³⁷

DNA sampling and Isotopic sampling do not require any direct physical tagging of the timber. DNA sampling can be taken from the wood at any stage in the supply chain and is compared against a map to determine the material's area of origin. DNA sampling is relatively expensive and requires samples to be taken on order to build geographic maps and databases. Isotopic sampling uses a similar process but is traced to isotopes found in the soil to link it to a geographic region.

Vermont Wood / Traceability & Value Chains

As mentioned previously, we heard from players in multiple wood products subsectors that there is demand for wood inputs (lumber, flooring, furniture parts, etc.) that can be traced back to Vermont. A system that is able to provide secondary producers with a supply of Vermont wood inputs is likely to meet demand across a wide range of value chains.

There may be an opportunity to pilot a project, possibly using more advanced technology, that connects builders and manufacturers with a market-driven demand for Vermont wood back to landowners, loggers, foresters, mills and lumber wholesalers that work together to generate traceable supply. Kevin Boston and Chris Knowles, of Oregon State University College of

^v QR Codes — short for Quick Response Code — is a type of barcode that uses black modules on a white background in a square grid to store data. QR codes are used for product tracking, inventory management and general marketing. There is free software available for developing QR codes and many free applications for smart phones for reading QR codes.

Forestry, feel their barcoding system (using QR codes and tagging paint) is ready to pilot in a Vermont-based traceability project.³⁸ This system is very low-cost, fast, easy, durable, and has a low barrier to access. Piloting this project in Vermont would include the manufacture and distribution of a QR code stencil for logs and a smaller stencil for lumber and other wood products and could likely be piloted with a small group of potential early adopters, such as those participating in *The Forest Partnership* or others that participated in the Green Wood Collaborative.

Conclusions

1. Before moving forward with *Local Wood, Local Good*, outreach to national organizations is required. It is possible that elements of *Local Wood, Good Wood* may fit into other ongoing efforts in the hardwood industry, particularly the hardwood checkoff program that is currently in development.
2. Forestland and forest product certification is a relatively new phenomenon and one to which the market in the U.S. is still adjusting. At this time, market signals support certification in selected markets (such as wood furniture for national home and office furnishings companies), but not across the board. By and large, the additional costs to the landowner and to chain of custody businesses of full FSC certification cannot be passed on to the buyers because the market will not support it. Investments in certification only make sense as part of an economic development strategy when markets demand it, and, ideally, when customers are willing to pay to cover its cost. The opportunity to connect Vermont's certified forest resource with market demand is best considered on a case-by-case basis.

Connecting Vermont's certified land base with market opportunities will depend on the characteristics of the materials the land base has to offer and the status of market demand. Given the uneven development of market demand, a push for increased certification based on an argument related to economic returns does not appear to be justified at this time; however it makes sense to continue to look for the highest and best use of wood from certified acreages. If one or more subsectors of the industry choose to strengthen demand relationships with buyers that require a particular certification such as FSC, it may be possible to create incentives to increase the volume of certified land.

3. There is a trend toward valuing transparency and traceability in value chains, including in the forestry and wood products industry. This coincides to some extent with an increase in consumer interest in product origins and, particularly, in support for "local" products. Finding ways to lower the transaction costs of traceability while increasing the reliable supply of Vermont-derived raw materials to secondary producers could help Vermont's forestry and wood products industry close the gaps between landowners and primary and secondary processors, open up new markets and entrepreneurial opportunities, and add value to the state's economy.

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