United States Environmental Protection Agency New England

Sustainable Design & Building

Using Green Certified Wood

Updated January 2007

Summary: Institutions of higher learning can be leaders in creating a sustainable society; by educating future generations, and practicing the means to achieve this important goal through campus design and operations. To this end, Middlebury College championed the establishment and rapid growth of a certified wood industry in Vermont. Over the past five years, Middlebury has created demand by using nearly 200,000 board feet (bf) of green certified Vermont wood (both from the College's own land as well as family-owned forests in the state) in campus construction projects. In Bicentennial Hall, completed in 1999, seven species of wood common to the northern hardwood forest were specified by the architect. Millwork samples were created that highlighted the wood's natural beauty, its variations, coloring, and character marks. Use of the certified wood has grown with each new building project. The results are beautiful wood paneling, flooring, ceilings, and furniture. It has served to inspire building professionals and peer institutions and to strengthen the campus' connection with place in Vermont. The magnitude and long-term effects that Middlebury has affected at its own institution, and at others throughout the region, is monumental. It demonstrates how a responsible, large institution can serve as a catalyst for positive change in the region's economics and environmental sustainability efforts, as well as benefit the community and facilitate in information sharing.

Middlebury

Campus Profile

Middlebury College
Middlebury, Vermont
UG Students: 2,297
Summer Program for English & Language Students: 661
Resident Students: 95%
Students Abroad: 350
Faculty & Staff: 1,219
Campus Area: 350 Acres
Operating Budget: $130 million

Green Report

Environment Web Page http://community.middlebury.edu/~enviroc/ Question EPA's Environmental Merit Award honoring the Certified Wood Project in 2003; President McCardell established Environmental Studies and Awareness as a Peak of Excellence in 1994; received the Governor's Pollution Prevention Award; and School Recycler of the Year award from the Association of Vermont Recyclers.

Project Goals

- Tie together a conviction to achieve environmental excellence and a commitment to bettering the community.
- Ensure wise financial investing in VT sustainability oriented businesses.
- Promote on-going active learning and sharing.
- Create an openness to pioneering new approaches.

Pre-Project Considerations

- Look at the local economy to determine what type of businesses it currently supports and can support. Ensure that green certified wood for building purposes grows locally and that you have access to local green certified wood processors.
- Search for contractors, engineers, and architects with either "green" project experience or the willingness to learn.
- Start early in the process to identify wood species and quantities that will be used in the building and, if applicable, its furnishings. This will allow adequate time for utilizing local wood and/or woodworkers in the building project.

Created by Campus Consortium for Environmental Excellence through EPA funding

Steps Taken

When the new science center, Bicentennial Hall (Bi-Hall), was proposed in the early 1990s, the College's Trustees identified "green" design and construction as a top priority for the $47 million project. Following a design charette and with the Trustees' directive, the architects, engineers and project managers incorporated sustainable design, construction methods, and materials into the plan.

First Phase in Using Green Certified Wood:

- Educate all involved parties on sustainable and green building design.
- Design projects with local wood products designating species based on what the local forest can yield.
- Purchase the wood for construction from Vermont forests within proximity of the campus.
- Explore the definition of top quality wood to recognize the natural beauty of grain patterns, coloring, and sound knots – this is referred to as character wood.

Second Phase in Using Green Certified Wood:

- Certify forest lands owned by the college.
- Use local wood industry processors from sawyers to carpenters.
- Broaden incorporation of certified wood into specifications for furnishings and develop contracts with local furniture manufacturers.
- Share results with others to encourage replication and increased use of local, sustainable products in other regions.

In 2002, Middlebury College opened three new buildings incorporating local green-certified wood. The new facilities included a residence hall and a dining hall that incorporated 58,000 bf of green certified wood from five local woodlots and College land, and a Recycling Center that utilized 16,000 bf of spruce harvested from College land. The College then furnished the dining hall, classrooms, and study lounges in these buildings with tables, chairs, display cases, and sofas crafted by local businesses using green certified wood from Vermont.

When the dorm, LaForce Hall, opened in the fall of 2002, each resident received an information sheet describing the environmental features and suggesting ways to reside there more sustainably. Recognizing the importance of documenting this process, the Office of Environmental Affairs asked a student to pictorially track the certified wood process from forest to ceiling panel installation. These photos were incorporated into a large display highlighting the extensive involvement of sixteen value-adding processes (sawyers, millwork shops, dry kiln operators) that hangs outside the dining hall.

The Library is the most recent construction project. In this project, the College awarded a contract to an employee-owned woodworkers' cooperative in an economically stressed area of the state for the manufacture of study carrels and stack ends from certified wood.

Designers of the new library used *Designing the Future: A Framework for Implementation of Sustainable Design and Construction Standards for Middlebury College* (Middlebury's own sustainable design framework), coupled with program specifications, to create a new library and information technology center that highlights not only energy efficiency and local materials, but information technology for the 21st century.

Participants

Executive Vice President of Facilities Planning, Dave Ginevan, and Nan Jenks-Jay, Director of the Office of Environmental Affairs, provided much of the vision for the use of certified wood in the new buildings on campus. The expertise and commitment of construction project managers, purchasers, carpenters, facilities operation managers, the college forester, campus sustainability coordinator, administrators and Trustees of the College, and building occupants all played an important part in this program.

- Dave Ginevan, Executive VP of Facilities Planning (project development and oversight)
- Nan Jenks-Jay, Director of the Office of Environmental Affairs (project catalyst and expansion)
- Tom McGinn, Project Manager, Facilities Planning (millwork specifications)
- Mark Gleason, Project Manager, Facilities Planning (millwork specifications)
- Jennifer Bleich, Assistant Project Manager, Facilities Planning (furniture specifications)
- Steve Weber, College Forester, (certification of College woodlots) added parenth here, that you might miss because it is so small
- George Whitney, Director of Operations, (furniture specifications)
- Betty Anderson, Assistant to the Director of Operations (furniture specifications)
- Norm Cushman, Assistant Director for Maintenance & Operations (Recycling Center wood specifications)
- Connie Leach Bisson, Campus Sustainability Coordinator (education, liaison with peer institutions)

Beyond the institution, development of the sustainable wood industry in Vermont required the support of architects, construction contractors, woodworkers, furniture manufacturers, sawmill and kiln operators, loggers, woodlot owners, truckers, and peer institutions. Vermont Family Forests, an alliance of regional woodlot owners who manage their forests through ecological forest management practices, provided consulting and marketing services throughout the development of the use of certified wood at Middlebury College.

Performance and Benefits

- In 1999, the College opened a new six-story science center, Bicentennial Hall. Architects, engineers, and project managers incorporated sustainable design, construction methods, and materials into the plan even though they had no previous experience in green building. The plan included energy efficiency through design, triple glazed/high-E windows, insulation, fluorescent lighting, and a heat recovery loop in the air system. Construction waste was recycled. Solar powered lights illuminate the parking area's pedestrian steps. Linoleum flooring was installed as were other products made from recycled materials.
- Bi-Hall leveraged significant change in the region. Over 30% of the building materials came from Vermont including nearly 125,000 board feet of green certified wood. Due to the large volume and the College's request that wood be certified and locally harvested and processed, Middlebury jump-started a new sustainable wood industry in Vermont. Thirty-two local businesses where involved in the process and 75% of the wood came from forests within 30 miles of campus.
- Two student projects associated with Ross Commons and the Recycling Center resulted in an article in Northern Woodlands Magazine and an exhibit documenting the wood from forest to installation. Another beneficial student outcome was an Environmental Studies senior seminar project investigating the economic, ecological, and community impacts of using local wood instead of the original architectural specification for clear cherry that would have likely come from Pennsylvania.
- Received third party certification by the Forest Stewardship Council (FSC) for wood lots on campus.
- Assisted an employee-owned woodworkers' cooperative (formerly an Ethan Allen operation) obtain financing. The cooperative is located in the economically depressed Northeast Kingdom and focuses on using local, sustainably harvested wood.

- Worked with more than 60 small certified forest lot owners and businesses in Vermont to log, haul, mill, and prepare wood - often resulting in value added, higher returns for these local businesses and service providers.
- In May 1999, the Trustees endorsed a resolution, recommended by the Environmental Council approving guiding principles for sustainable design and construction "that embodied the philosophy and spirit of the College and…outlined the College's environmental goals pertaining to construction, renovation, operation, and maintenance of campus facilities."
- Developed a set of design guidelines (*Designing the Future: A Framework for Implementation of Sustainable Design and Construction Standards for Middlebury College)* with a committee that included staff from Facilities Management, Facilities Planning, Environmental Affairs, faculty, and students serving on the Student Government Association's Buildings subcommittee, and a consulting environmental architect. Middlebury's sustainable design and construction standards were put into practice and applied to every project after Bicentennial Hall. Middlebury's sustainable design standards, which reference Leadership in Energy and Environmental Design (LEED), will become part of the College's Master Plan given to all consultants.
- Received strong support from and worked with Middlebury College's Board of Trustees, the Cornerstone Project (Middlebury College is a founding member), Vermont Family Forests (VFF), Forest Stewardship Council, architects, construction companies, regional woodworkers and handlers, media, alumni, administrators, students, government officials, and peer institutions.
- Middlebury's Environmental Affairs cooperated with VFF to produce the report *Bicentennial Hall: Local Wood from Well-Managed Family Forests* tracing each step and identifying how to make the process more efficient and locally grounded. The report guided many changes in this fledgling industry and gave others the confidence to participate.
- Influenced professional consultants (i.e., architects, engineers, contractors, etc.) working with the College who agree that they have transferred learning and sustainable concepts from Middlebury to other clients' projects worldwide.

Financial Info

The US Bureau of Economic Analysis estimates that, for every additional $1 of millwork or veneer produced about $2.40 worth of output is directly or indirectly required. For the Bicentennial Hall project, this amounted to about $3.5 million for architectural woodwork alone. As the process becomes more mainstream and localized, more and more of this multiplier may be captured by the local economy.
Vermont Family Forests summarized some of the economically beneficial outcomes of utilizing locally-grown certified wood for Bicentennial Hall -- the landowners received a premium for their timber, loggers were paid 60% more for doing excellent work, Middlebury received its wood at just about 5% above the market norm, and the forest was left in excellent condition.

Lessons Learned

Middlebury learned many lessons from the Bi-Hall project. They realized that the College was in some ways ahead of others in its desire for sustainable building design. Their consultants, whose experience was with science centers, libraries and residential halls, not green architecture, realized this as well. Middlebury was asking for something consultants were not yet prepared to deliver. Everyone in the process learned together how to implement this type of program.

By working directly with the forest or producers, and not a lumberyard or catalogue for products, it required the college to start much earlier in the process and to be more thoughtful about meeting completion deadlines.

Middlebury has also found that through its imperative for sustainable design and construction that it can influence professionals from local carpenters to international architects about the importance of local economies and environmental quality as it also leverages large-scale change in the region.

For Further Information

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Forest Stewardship Council (FSC)
http://www.fscus.org/
http://www.fsc.org

Vermont Family Forests
http://www.familyforests.org/

Cornerstone Project
http://www.vsjf.org/sustainable_forestry/cornerstone_project.shtml

Commentary

Thank you to Nan Jenks-Jay, Director of Environmental Affairs at Middlebury College and Connie Leach Bisson, Campus Sustainability Coordinator for their writings and input into this Best Management Practice.

A project manager on one of the recent Middlebury College construction jobs involving Vermont certified wood with character marks pointed out that "people working on the project were initially taken aback, but by the end realized that it takes a better eye, more creativity and a higher level of craftsmanship, so came away with a real sense of pride in what they had done."