Environmentally Preferable and Sustainable Wood

We believe there is an opportunity for wood that is marketed as being from the sustainable forests of North America. If you are like many people (like me), the whole issue of green building and forest certification is so complex and confusing it is difficult to know where to begin. You may have even resisted knowing anything about what some consider a “tree hugger” issue. But like so many things in life, the time comes when we have to deal with it. For example, more and more often commercial and governmental projects require LEED certification (or some other green rating system) and hence wood used in the project must be certified. Increasing environmental consciousness and market demand are reasons to understand these green rating systems. In addition, it is important that wood products industry representatives have an understanding of these rating systems in order to influence their application and correct any shortcomings. Wood is THE SUSTAINABLE building material, but unfortunately too many decision makers do not know, or do not believe that to be the case. The objective of this (brief) article is to give a basic introduction to forest certification and green building programs and their shortcomings. Thanks and credit to Dr. Jim Bowyer, Director of Responsible Materials Program at Dovetail Partners whose articles provided most of the information for this (often verbatim) summary. Complete references are at the end of the article.

Forest Certification Programs
The four forest certification programs used in North America include: Sustainable Forestry Initiative (SFI); American Tree Farm System (ATFS); Canadian Standards Association (CSA); Forest Stewardship Council (FSC).

Common elements of these certification programs include: compliance with local, state, and federal laws; overall environmental impact; forest management plan; monitoring and assessment; and maintenance of high conservation value forests. FSC is dominant in use, but not strictly scientifically based. The FSC certification program identifies the critical elements of responsible production as:

a. compliance with laws
b. operation under a management plan that ensures appropriate protection of flora, fauna, water quality, soil productivity, historic areas, old trees, etc;
c. maintenance of high conservation value forests;
d. attention to indigenous people’s rights and tenure and use rights and responsibilities;
e. attention to rights of workers and to the well-being of local communities;
f. attention to who receives benefits from the forest, with the objective of ensuring that benefits are not siphoned off by large corporations or
certification programs

Many green building programs require that FSC lumber (only) can qualify. Less onerous wood certification programs (such as Sustainable Forestry Initiative (SFI) and American Tree Farm System (ATFS)) that focus on sustainable forest management rather than people issues (e.g., indigenous people and workers’ rights) are not accepted by many green building programs. The irony is that most construction lumber used in the US are softwood species that come from responsibly managed forests in the developed nations (US, Canada, western and northern Europe, etc.) and its manufacture into lumber has low environmental impact compared to other non-wood building materials.

Designation of environmentally preferable building materials is not scientifically sound. Instead, it is generally based on personal bias, intuition, internal politics, and single attributes. A better approach based on data would be to use an environmental accounting system to evaluate the environmental impacts of any given product. This accounting is called Life Cycle Assessment (LCA), and uses a Life Cycle Inventory (LCI) to describe the manufacturing process, product use and disposal, and collects real data. Reporting of LCI results would include data on the embodied energy and carbon emissions in producing similar amounts of various materials (Table 1). Embodied energy is the quantity of energy required to harvest, mine, manufacture, and transport a product to the point of use. As seen in Table 1, converting wood to a product consumes less process energy compared to alternative building materials, and the smaller amounts of fossil fuel required result in lower net carbon emissions. (Also, because wood stores carbon (about half the weight of wood is carbon) wood products can actually have a negative net carbon emission.)

(continued)
Table 1. Comparison of different building materials in terms of embodied energy and net carbon emissions.

<table>
<thead>
<tr>
<th>Material</th>
<th>Embodied Energy (Million Joules/m³)*</th>
<th>Net Carbon Emissions (Kg/metric ton) **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber</td>
<td>1,380</td>
<td>33</td>
</tr>
<tr>
<td>Brick</td>
<td>5,170</td>
<td>88</td>
</tr>
<tr>
<td>Concrete</td>
<td>3,180</td>
<td>265</td>
</tr>
<tr>
<td>Concrete block</td>
<td>2,350</td>
<td>291</td>
</tr>
<tr>
<td>Aluminum (virgin)</td>
<td>515,700</td>
<td>4,532</td>
</tr>
<tr>
<td>Aluminum (100% recycled)</td>
<td>21,870</td>
<td>309</td>
</tr>
<tr>
<td>Steel (virgin)</td>
<td>251,200</td>
<td>694</td>
</tr>
<tr>
<td>Steel (100% recycled scrap)</td>
<td>37,210</td>
<td>220</td>
</tr>
</tbody>
</table>


** Source: Bowyer, J.L. 2009. Are Green Building Programs Really Leading to Green?

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<table>
<thead>
<tr>
<th>Key Word</th>
<th>2006-09</th>
<th>2009-to-date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>23.0%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Fire</td>
<td>19.9%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Children</td>
<td>17.4%</td>
<td>15.9%</td>
</tr>
<tr>
<td>Toy</td>
<td>14.4%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Choking</td>
<td>11.5%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Fall</td>
<td>9.9%</td>
<td>16.4%</td>
</tr>
<tr>
<td>Burn</td>
<td>9.8%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Strangulation</td>
<td>6.4%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Laceration</td>
<td>5.4%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Shock</td>
<td>5.3%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Bed</td>
<td>0.9%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Crib</td>
<td>2.1%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Chair</td>
<td>2.6%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

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** Still Outsourcing? **

Let the buyer beware stumps from a centuries old doctrine called “caveat emptor”. The products we purchase are much more complex and we know more about what may harm us than in earlier times. The best example is lead paint, banned for residential use in the US in 1978. Be able to offer and market quality products that are reliable and safe is another market advantage that domestic value added wood products manufacturers can use to differentiate product based on value. In recent years we have heard of many consumer product recalls with many of these products having been manufactured in China. Here is a partial listing of newsworthy Chinese products that have been recalled in recent years:

- Pet foods contaminated with melamine
- Lead paint on toys
- Toxic offgassing in wall board
- Toxic sofas in Europe
- Melamine in milk and baby formula
- Diethylene glycol in Chinese toothpaste
- Tread separation in tires

Specifically we examined problem products that originated in China. Of course China is not the only place that can make defective products. But China has become a manufacturing giant with global reach, and only those with rose colored glasses think the Chinese system is equal to the U.S. in terms of preventing and eliminating problematic products.

Since China joined the WTO in December 2001, the CPSC has posted over 1300 recalls on various Chinese products. In examining key words, lead was involved in 23% of the recalls since 2006, danger of fire in 20%, mention of children in 17%, and toy in 14% (see Table below). Some recalls contained more than one keyword, such as “fire burn”. Comparing CSPC 2009 to-date data indicate these key words comprise a smaller percentage of the total recalls.

The key word “furniture” was used only 1 time from 2006-2009. The frequency of the keywords bed, crib, and chair seems to be increasing, with 4, 7, and 6 recalls containing these words, respectively, during 2009 alone.

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** Workshop Handouts Available for Downloading **

PDF files containing materials from previous workshops conducted in conjunction with the Under Utilized Eastern Hardwood Species Market Development Project can be downloaded from: [http://www.ces.ncsu.edu/nreos/wood/Under%20Utilized%20Species%20Project/past_workshop_handouts.html](http://www.ces.ncsu.edu/nreos/wood/Under%20Utilized%20Species%20Project/past_workshop_handouts.html)

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Literature Cited


Which Way for the Economy?

It is anybody’s guess which way the economy is headed. Here are a couple of indicators:

The summary November outlook from the National Association for Business Economics website (http://www.nabe.com/pubs.htm) states the following:
• Reaffirmed October statement that the Great Recession is over;
• Expect economic growth in 2010;
• “Jobless” recovery will end in the next few months and companies will add rather than cut jobs;
• Expect a sizable housing rebound, low inflation, but a sluggish consumer upturn.

Another frequently used statistic is the number of housing starts that are reported. The US Census reported in December that single family housing starts in November were at a rate of 482,000 or 2.1% above October’s rate of 472,000, and 5.5% above November 2008 (Figure 2).

Most pundits are saying that the reduction of unemployment will lag in this recession. Let’s hope that 2010 will see employment gains, and to track NC unemployment county-to-county here is a link courtesy of Raleigh TV WRAL: http://www.wral.com/news/state/page/4879060/

Figure 2. Housing Starts of privately owned, single family housing units (seasonally adjusted annual rate). Source: Department of Commerce.

Seen on the Web

Furniture Today online magazine reported this past October that there may be a shortage of workers at Chinese furniture factories if the economy rebounds quickly. Apparently because many workers have been let go and returned to their rural homes there may be a labor shortage in the spring. Some importers are concerned about longer lead times. Read the online article at: http://www.furnituretoday.com/article/35686-China-furniture_factories_run_short_on_workers.php?nid=2373&rid=4006909

The Washington Post ran a November article concerning the impact of globalization on Hickory and North Carolina. The article mentions that the Labor Department has certified more than 90,000 North Carolina jobs were lost because of foreign competition – more than any other state. Read the article at: http://www.washingtonpost.com/wp-dyn/content/article/2009/11/09/AR2009110903705.html?wpss=rss_print

Also available to you is a pdf copy of Strategies for the New American Furniture Industry by Phil Mitchell and Harry Watt at: http://www4.ncsu.edu/~pmitchel/publication.htm

Upcoming Wood Products Workshops from NC State University

Wood Technology for the Non-Wood Technologist. Properties, products and processing of solid wood. Likely in May or June. Contact Phil Mitchell

Two workshops, one on the Finishing of Wood Products and the other on Gluing Wood will be held in February or March, the exact dates TBD. Contact Harry Watt

Directory of North Carolina’s Value Added Wood Products (Self Listing Web Page)

NC State University Wood Products Extension office is promoting companies that manufacture wood products made in North Carolina. For maximum benefit to our industry, we encourage shops and manufacturers to self-register in our online directory. Please take a few minutes to fill out the form and list your company in the Directory of North Carolina’s Value Added Wood Products Manufacturers: http://www4.ncsu.edu/~pmitchel/directory_email_form.htm.

Access the most recent directory at: http://www4.ncsu.edu/~pmitchel/vadirectory.htm.

Wood Products Extension

The mission of Wood Products Extension within the Department of Wood and Paper Science at NC State is to increase the competitiveness and profitability of North Carolina’s wood products industry, improve markets, and increase consumer understanding of wood products and their proper use. Find us on the web at: http://www.ces.ncsu.edu/nreos/wood/

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