

## **LCA COULD BE AN ENVIRONMENTAL BOON TO PTW**

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### **Summary**

Pressure-treated wood has many desirable environmental features. How can the wood preservation industry show that its product is environmentally superior to other materials? The Treated Wood Council hopes to do this with Life Cycle Assessment, the scientific tally of cradle-to-grave environmental impacts. An extensive program is now under way to gather data on six treated wood products and compare them to data on alternative materials.

### **An Update from the Treated Wood Council**

If you listen to the environmental doomsday crowd, you would think we are going to hell in a handbasket. And it is a filthy handbasket, made with carcinogenic chemicals, encrusted with genetically modified organisms, and existing in a globally warming climate. Bleak, unpopulated landscapes are coming soon to a continent near you.

On the other hand (or handbasket), if you read magazines or watch television, you could think that nearly every advertised product is Man's thoughtful gift to Mother Earth. If we just switched to these environmentally beneficial products, our planet would not have any environmental issues.

These manufacturers may *say* that their products are environmentally wonderful. We are trustworthy wood preservers; we *know* our products are good for the Earth. How can a manufacturer prove the environmental benefits of his product? How can we wood preservers prevent purchasers from being influenced by the dubious claims of our competitors?

There are tests, certifications, and a host of ecological merit badges that purport to provide evidence. The most objective, most comprehensive evaluation right now is the Life Cycle Assessment, or LCA. The Treated Wood Council is attempting to compile credible LCAs that will demonstrate the environmental value of preserved wood.

The Treated Wood Council<sup>1</sup> (TWC) was formed in 2003. It consists of one executive director with helpers who are contracted as needed. Its members, now numbering about 440 companies, encompass preservative manufacturers, wood treating companies, lumber producers, and associated organizations. TWC's membership is broad, but its focus is quite narrow: To monitor, and where advisable to influence, legislative and regulatory actions. Legs and regs. It is not a promotional organization, and it doesn't create standards or provide a technical forum. It concerns itself strictly with government affairs.

Environmental matters may seem outside of that narrow focus. However, in building codes, government specifications, and public policy, more requirements are appearing for green building, and sometimes treated wood is left behind. The specs for many schools, post offices, military facilities, and other buildings now require green building certification. There is also a growing trend in “private regulation” – retailers like Walmart and Home Depot and manufacturers like Proctor & Gamble are establishing their own product and packaging requirements. Helping to show that preserved wood meets environmental requirements was deemed to fall within the scope of the Treated Wood Council. At a TWC committee meeting in the summer of 2007, a decision was made to pursue LCAs for treated wood products.

There are at least three good reasons for developing an LCA. It can provide (1) a measurement of the environmental impacts of a product, (2) an opportunity to reduce those impacts, and (3) a comparison to alternative products. The primary objective for TWC’s LCAs is to compare treated wood against other materials. If we have a scientifically-accepted, peer-reviewed document showing environmental superiority for treated wood, then we have a useful tool when it comes to influencing government officials, code writers, code enforcers, and specifiers.

Various environmental consultants were contacted in order to find a group that could take on the project. In March of 2008, a firm was chosen. We thought this project was perfect for funding by the Binational Softwood Lumber Council. We made friends on the Committee and we submitted our proposal, but we were rejected. As noble as our plan might have been, it was viewed as a scientific endeavor, not a promotional one, and the Binational Council is restricted to funding promotional activities. Though disappointed, the Treated Wood Council felt that the LCA remained worthwhile to its members. By reducing the number of reports, stretching out the timeline, and spreading expenses over three or four years, TWC has been able to assume the financial burden itself.

TWC is a trade organization, with diverse members holding competitive opinions and favoring different treatments. For the membership to be willing to pay for LCA studies, we had to come up with applications and preservatives that would satisfy the group and make sense in the marketplace.

Originally we planned to do 11 comparisons. We narrowed that down to six studies:

1. ACQ-treated decking, which would be compared to composite decking
2. Creosote-treated cross-ties, compared to concrete ties
3. Penta-treated utility poles, compared to steel, aluminum, and concrete poles
4. CCA-treated marine piling, compared to concrete, steel, and plastic piles
5. CCA-treated guardrails, compared to steel guardrails
6. Borate-treated framing, compared to steel studs

We are well along in developing the six LCAs.

An LCA is a significant undertaking. It requires data on all of the cradle-to-grave inputs and outputs for a product. In our case this starts with the resources needed to plant and fertilize seedlings. It continues with harvesting trees, transporting logs to mills, debarking and sawing them, obtaining preservative ingredients, transporting chemicals, operating a treating plant,

distributing lumber, and installing projects. This is carried through to the end of the product's life and its disposal. It is a tedious collection of data, with many assumptions made throughout the process – how long does the product last, what species is involved, what distance is the average piece of wood shipped, how often is it maintained, is it reused or sent to a landfill, what is the unit of comparison to the alternative product? These look at the surface layer. Deeper levels include the impacts of manufacturing saw blades to cut logs, lift trucks to carry lumber, and maintenance products to coat decking.

Issues such as these were debated in our subcommittee until we came up with an outline of assumptions. Our consultant told us what data were needed. Survey forms were sent to producers to determine numerical values. For information on upstream inputs and alternative products, we relied on the growing library of published LCA data.

Eventually, a binderful of data was collected and condensed to a handful of important factors. We are concentrating on seven scales: greenhouse gas generation, fossil fuel use, water use, acid rain production, smog potential, eutrophication, and ecological toxicity.

A meaningful assessment must conform to accepted guidelines. The International Organization for Standardization has established ISO standards for LCAs. We want to make sure that our findings are credible, and have been very conscious of following proper procedures. TWC has taken extra steps in order that our studies will be widely accepted. Results are not being released prematurely; we do not want to jeopardize the chances for publication.

When a draft of an LCA is completed, it is reviewed first by the LCA subcommittee. Then studies are sent to a panel of three *internal* reviewers – a university professor and two independent scientists with years of experience in wood products. Their comments are discussed, and revised studies are forwarded to an *external* review panel. Dr. Paul Cooper is a member of that panel, as are a scientist from EPA and an expert who works for a company that prepares LCAs. Once their comments are addressed, a manuscript is sent to a scientific journal. If accepted for publication, other peer-reviewers give it a further examination with more possible revisions. Only then is the study published and available for public use.

Right now, we have a lot of sound logic behind our environmental position – e.g., comparatively little energy is required for wood production since nature provides most of it, trees absorb carbon dioxide and wood products sequester carbon, preservatives extend the service life of wood. Nevertheless, we get no credit in the leading rating system for green building. Many people believe that cutting trees is harmful to the environment, and we have to endure the irritation of steel and plastic advertisements proclaiming their green attributes. Our LCAs should validate our logic. They might also help with green rating systems; the National Green Building Standard awards points for product decisions made by comparing LCA data.

When you look at an LCA summary, you see measurements for a variety of impacts. It would be unusual if data showed one product to be superior to an alternative in *all* of those measures. Just about every product has some good environmental characteristics. That's why there can be so many green-oriented advertisements for so many barely-green products. And just about every product has some characteristics that are not-so-good.

An LCA is similar to the nutrition labeling on foods. One product may be higher in Vitamin C, but lower in Iron. The same goes for LCAs. One product may require less energy, but require more water for production or it may generate more greenhouse gas.

Preserved wood is looking very good on most measures but, even if our products should surpass the competitive choices, the battle is not over. Just as the nutrition information is not the only factor used by purchasers in making a food selection, environmental burdens are not the only factors used in choosing a building product. A grocery shopper still considers taste, cost, calories, appearance, and image. Likewise, an architect is still going to weigh price, aesthetics, availability, labor, maintenance, reputation, warranty, past experience, and other factors that have little connection to the environment. Many of the factors are judgements. We will have to continue promoting our products and persuading specifiers that treated wood is their best choice. But, with our LCAs, we will have solid ground on which to substantiate our environmental arguments.

Here is where we stand (as of October 13, 2010) with each of the six LCAs:

1. ACQ-treated decking ... final report being considered for publication by the *Journal of Cleaner Production*
2. Creosote-treated crossties ... completed internal review, gone for external review
3. Penta-treated utility poles ... has completed external review, ready for submission to a publication
4. CCA-treated marine piling ... initial draft nearing completion
5. CCA-treated guardrails ... research complete, initial draft to be written
6. Borate-treated framing ... final report being considered for publication by the *Journal of Cleaner Production*

As for comparative results, we can look at the draft for one of the LCAs. Steel generates 7.5 times more greenhouse gas than the treated wood, and concrete generates 14 times more. In fossil fuel consumption, steel requires 1.9 times more, and concrete 3.5 times. The differences are much larger in acid rain, but steel and concrete generate somewhat less smog.

In another of the drafts, the alternative product creates 2.9 times more greenhouse gases, uses 14 times more fossil fuel, and generates 4.3 times more acid rain than does preserved wood. Treated wood has less impact than the alternative choice on all seven scales, which is fairly uncommon.

Our LCAs do not end with their burdens or the competitive comparison. In an effort to determine if the differences really matter in absolute terms, data was collected on the effects of poles in general and the impacts of a deck on an average U.S. family's environmental footprint. If fossil fuel use is significantly different between two products but the amount of fossil fuel used is minute for both, then it hardly matters which product is chosen. The reverse of this is also possible. If the comparative difference is tiny but that scale represents a huge impact, there could be a noteworthy improvement by choosing a product that is only slightly better.

As it is turning out, the overall impacts of a deck are not so great as to suggest that people should stop building decks. But, the scales that are most significant – greenhouse gas potential and fossil

fuel use – happen to be the scales where preserved wood has a sizeable edge, and the scales on which alternative products stack up fairly well against preserved wood – water use, smog potential, and eutrophication – are the scales that matter least.

All in all, the results of a careful, scientific evaluation are proving what we always thought.

I encourage you and your salespeople to promote the environmental features of your products – on your websites, in your literature, on fax sheets, in e-mail closings, and to your employees. We have a good story to tell, and our products are not getting the credit they deserve. We have been so busy fighting each other that we have failed to make the case for wood and, especially, for preserved wood. We are involved with an environmentally responsible product; let's make sure that others appreciate this. The LCAs should help.

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