Canadian Wood Preservation Association

Potential Impact of The Wood First Act on Preserved Wood Products

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WoodWorksBC!

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On Preserved Wood Products

Introduction

In October of 2009, the Province of British Columbia established the Wood First Act – with the purpose of facilitating a "culture of wood" for construction in the province. The Act requires the use of wood as the primary building material in all new provincially funded buildings, in a manner consistent with BC's Building Code.

There are several progressive jurisdictions around the world, which have developed policies to encourage the use of wood - countries such as Finland, France and New Zealand. However, BC is the first jurisdiction in the world that has actually implemented legislation to do so.

The Act requires the use of wood, as the primary building material, in all new provincially funded buildings, in a manner consistent with BC's Building Code. It pertains to all new buildings and any expansion that increases the square footage of an existing building. This includes projects by Ministries, Crown Corporations, School Districts, Health Authorities and local government projects that receive Provincial funding. These organizations are being asked to make a concerted effort to consider using wood whenever it can be used effectively – to keep wood to be at the top of people's minds every time they start thinking about a construction project.

Implications for the Wood Preservation and Treatment Industry

This has two significant ways that the Wood First Act will affect the preserved wood manufacturing industry. The first impact pertains to non-residential buildings. Wood materials have been avoided for some building elements, due to concerns of durability - mainly pest, moisture and ultraviolet radiation damage. To the extent that preserved wood solutions can address these deficiencies, new opportunities will arise.

The second impact is the "spill-over effect" from the legislation into the realm of non-building applications. The renewed interest in wood materials is beginning to breathe new life into wood solutions for a wide variety of other structures.

Why Encourage the Use of Wood Materials?

On average, the Government of BC invests $2-$3 billion of capital every year in new buildings (Ministry of Forests, 2009). These include schools, recreation facilities, cultural centres, social housing, health care facilities and many other types of buildings. Using more wood in these projects is a good start. It will demonstrate our own commitment.

However, the greatest impact will be recognized by encouraging others to follow our example, in other parts of Canada, across North America and around the world. In fact, BC's international reputation for providing quality wood products and solutions is quickly growing.

Regional Economic Impact

This will have tremendous economic, social and environmental benefits. British Columbia is highly dependent on the economic opportunities provided by forestry, pulp and paper and wood product manufacturing (BC Stats, Business Indicators, 2009). More than 1/3 of BC's communities generate 25% or more of their total income from forest-related industries. (BC Stats, 2006 Income Dependencies, March 2009). Many communities and First Nations, rely on generating value from the forest resources to sustain their livelihoods and support their communities. Provincially, many of the services we enjoy as British Columbians, benefit from the revenues generated from products that originate from BC's world-class forest resource.

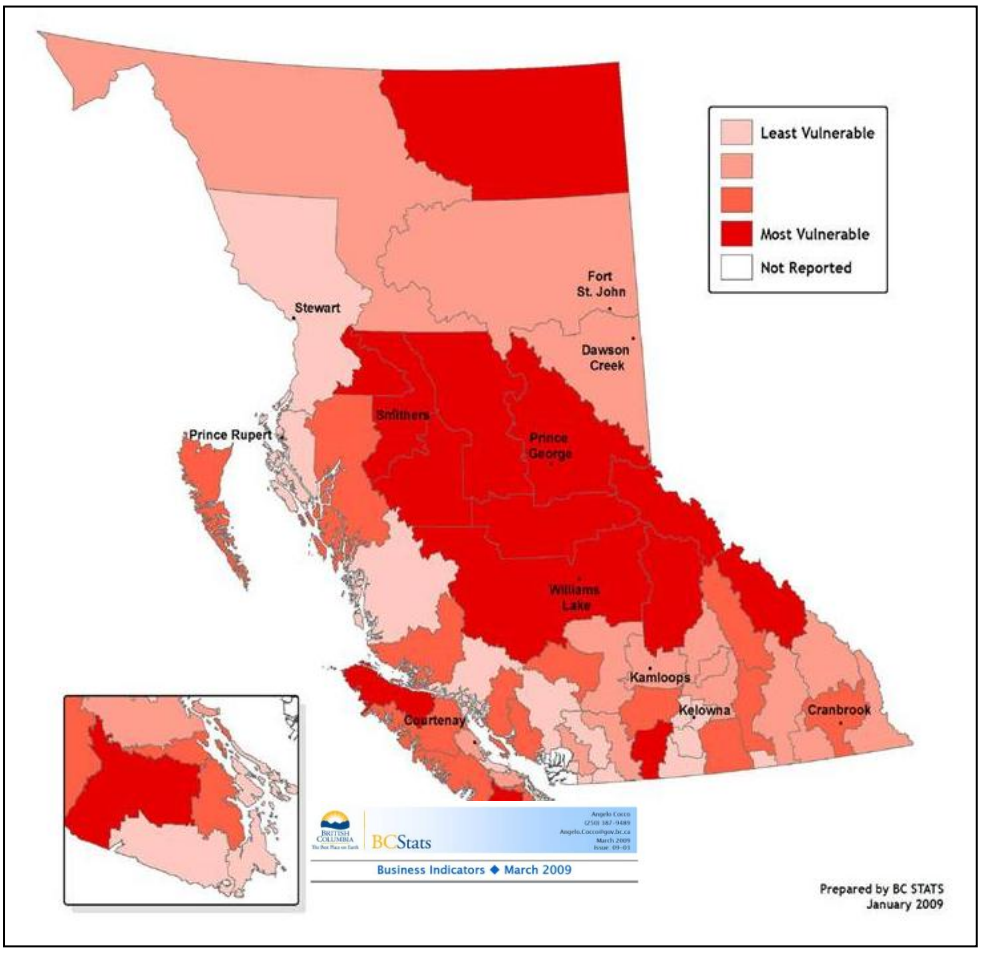


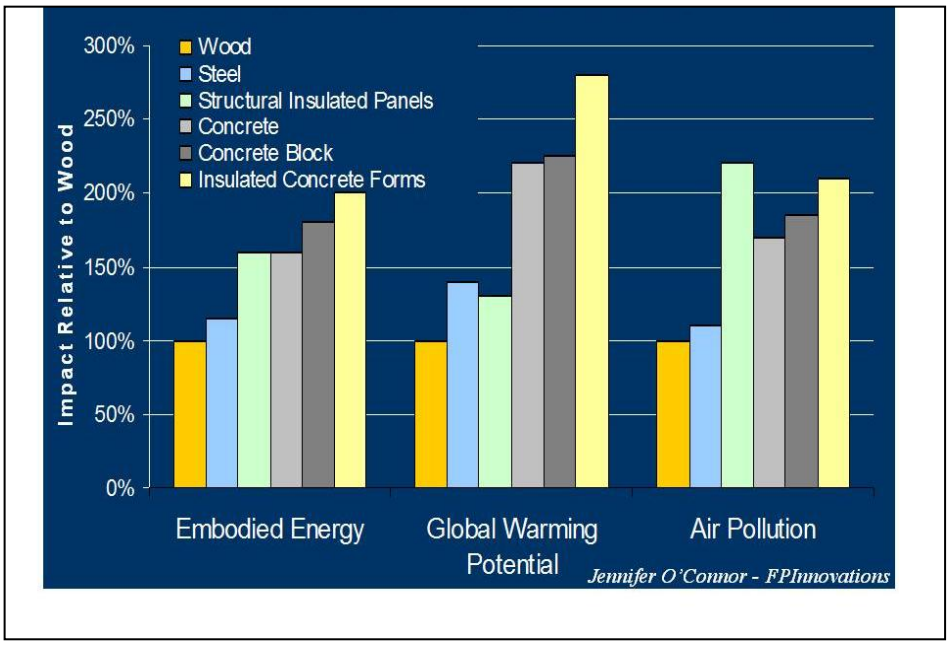
Figure 1 - Community Dependence on the Forest Industry

Environmental Benefit

Life cycle analysis, is the only methodology, that is internationally recognized as providing an accurate and comparable perspective on the true impact of various products and materials on climate change. As its name suggests, it calculates the total environmental impact of every step

in the life of a material. This includes growing or extracting all of the ingredients, transporting them to processing facilities, all of the impacts of manufacturing them, delivering final products on-site, the impacts of installation, the effects using and maintaining them for the duration of their lives, and then recycling or disposing of them at the end. This is the only fair way to compare the true environmental impacts of competing materials.

Analysis conducted by FPInnovations using The Athena Sustainable Building Institute's life-cycle inventory database clearly shows that wood building materials have by far the smallest



environmental footprint of any commonly used building material. They consume less energy,

Figure 2 - Embodied Energy of Various Wall Assemblies

use less water and create less air pollution than any other commonly used building system.

In fact, a recent review of 22 separate studies has shown that, every ton of dry wood used in construction displaces other building materials which would have created 3.9 tons more CO2 over their life cycles, than the wood products. (Sathre and O'Connor, 2008). Just to put that into context, one ton of dry wood is about 2 and ½ normal hydro poles. The average North American home contains about 16 tons of wood. So that means more than 62 tons of CO2 are avoided every time a home is built with wood.

And that's only one part of the equation. Remember that trees also capture carbon dioxide while growing. Lumber, panels and engineered wood building products made from trees, continue to hold the CO2 throughout all of the time they remain in the building – even longer if the material is reused or recycled. In fact, every ton of wood materials sequesters the equivalent to around 1.8 tons of carbon dioxide.

The great news, is that these effects are additive - the carbon dioxide that is displaced by not using more environmentally damaging materials is in addition to the carbon dioxide that is sequestered within the wood products themselves.

The research has shown that, on average, every ton of wood used in a building, prevents about 5.7 tons of carbon dioxide from being released into our atmosphere. As a result, the 16 ton home saves more than 90 tons of CO2. As you can imagine, the impact is even greater for larger buildings and other structures.

In fact, rather than directly requiring the use of wood, the Wood First Act could just as easily have favoured the building materials with the smallest environmental footprint and yielded the same result.

Impact #1: Opportunities for Preserved Wood in Commercial Buildings

The main purpose of the Wood First Act was to increase the amount of structural and architectural wood used in institutional, commercial, industrial and multi-unit residential construction. Wood was the material of choice until the middle of the last century. For many reasons, other materials have become the norm for building elements of building types which could readily be delivered using wood products in North America. Recent research has shown that, while only 19% of non-residential buildings use wood-based systems, current technology would enable more than 90% of them to be made with wood building materials (Wood Products Council, 2006).

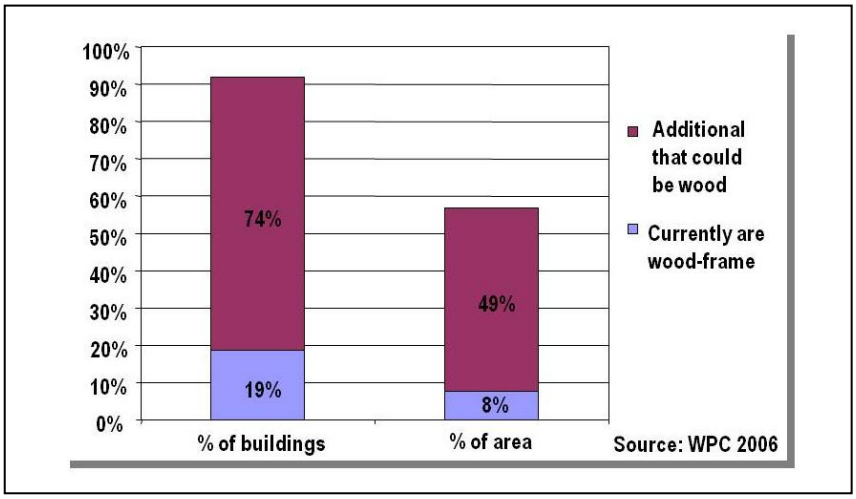


Figure 3 - Opportunity for Increased Use of Wood

The use of wood in larger, more sophisticated buildings amplifies the need for durability in the forms of moisture pest and ultra-violet light resistance, as well as dimensional stability. This is expected to expand the marketability of engineered wood products, preserved wood products, the new generation of modified wood products, and fire retardant treated wood.

This will expand traditional uses of treated wood products into much larger structures. Building elements such as sill plates, lower storey framing, exterior cladding, and hard landscaping should increase if they are pursued effectively. The Wood Enterprise Coalition – in conjunction with FPInnoviations, WoodWorks/Canada Wood Council and BC Wood will be publishing an "Appropriate Use of Wood" guide in the form of a Matrix of the Building Elements for Building Types that are likely to be affected by the Wood First Act (ie. they are built with some portion of funding from the Government of British Columbia).

The matrix reflects both the BC Building Code and the current state-of-the-art in wood design and engineering. As new wood designs are created and new wood building materials are developed, the matrix will be updated to reflect the best practices available to the building community.

In addition to summarizing the degree to which wood solutions can be employed for the different building elements of various types of buildings, the matrix will enable users to "drill-down" to example projects, case studies, technical bulletins and other resources that they may wish to draw upon to realize wood in their projects. The Matrix will be included in the upcoming Wood Enterprise Coalition web-site at: www.wecbc.ca. It is expected to become a "living document" which will be continuously adjusted and updated as new project examples come to fruition, new building materials and systems become available and new equivalencies with wood are approved.

The Appropriate Use of Wood Matrix was developed in two streams. First, for projects typically initiated by provincial government ministries, a working group was formed by the Ministry of Forests, with responsible members from each sector. The working group developed the categories and initial wood use guidelines that are shown for health, education and advanced education buildings. These are in the process of being reviewed.

Secondly, projects typically initiated by local governments, such as town halls, arenas, libraries and cultural centres, an expert panel consisting of architects, engineers, code consultants, building officials and technical experts from the WEC were consulted. The initial wood use guidelines in the matrix for these projects were developed by the panel.

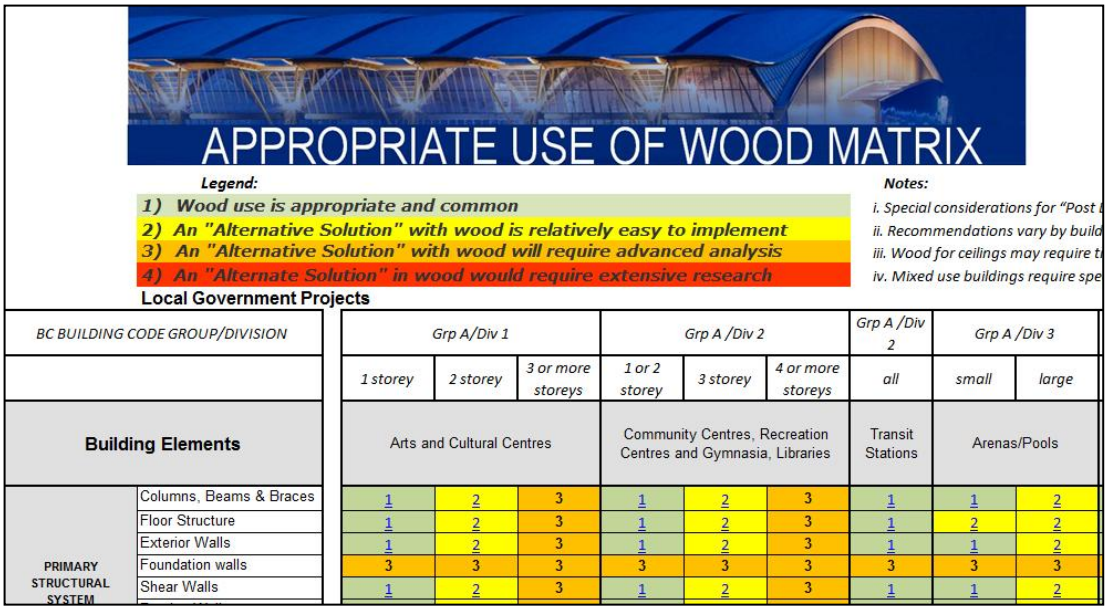


Figure 4 – Screen Capture from the Appropriate Use of Wood Matrix Web-Page

The Matrix will show where wood can be used easily, or where additional analysis, testing or code work would be required to achieve a wood solution with appropriate performance. Where

the limitations to wood use are durability, dimensional stability and/or combustibility, new opportunities for preserved wood materials will become available.

A special attention must be drawn to six-storey residential construction in BC. The recent building code changes in BC enable the construction of residential buildings using wood building systems up to 6 storeys. The careful analysis and study that preceded these changes included specific requirements for the durability and stability of materials to be used for certain key elements, especially for moisture control and fire retardancy. At time of writing there were 68 mid-rise projects either under construction, in design stage or being contemplated. The first, Library Square in Kamloops is nearing completion. A three building complex in Richmond is also already under construction, at a reported savings of 12% ($6 million) over the original concrete design.

Impact #2: Spillover of Wood First into Other Structures

Although the Wood First Act applies specifically to new government-funded buildings and building expansions, the impact of expanding the culture of wood is spilling over into other areas. For example, the new branch of the Bank of Montreal in Gibsons, BC is a noteworthy glulam, timber-frame structure, even though it is entirely a private sector endeavour. Significant spillover is also occurring in other areas where wood solutions either exist, or are possible.

Many of these provide direct opportunities for preserved wood product manufacturers as the preference for wood solutions grows. Here are a few examples:

Road Bridges: There are hundreds of examples of timber bridges in North America. Although steel and concrete components have attracted the majority of the market share in recent decades, there is renewed interest in the use of wood for a variety of bridge components. For example, the Ministry of Forests recently commissioned 6 portable timber bridges for its ongoing operations. A noteworthy example is the world's first Heavy Traffic (60 ton class) bridge in Sneek, Netherlands (right). All of these projects rely on treated or modified wood products.

Figure 5 - 60 Ton Bridge, Sneek, Netherlands

Figure 6 - Kingsway Pedestrian Bridge, Burnaby, BC

Pedestrian Overpasses: As rural and urban centres increase their use of wood in local projects, opportunities for wood in complementary structures are arising. Many communities are increasing their infrastructure for pedestrians and cyclists. For example, the architects of the Kingsway Pedestrian Bridge in Burnaby, BC, (left) selected wood simply because they felt it was the best material for the application.

Transit Shelters: Similarly, transit shelters, such as the one below planned for Kelowna, BC, are being developed using wood materials. This enables communities to further reduce their environmental footprint by using renewable wood to when providing low-carbon travel options.

Figure 7 – Harvey Ave. Transit Stop, Kelowna, BC

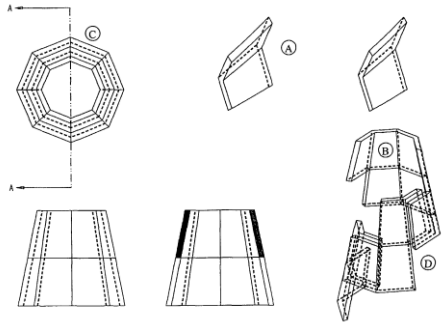


Figure 8 - WIPO Patent WO 03/069099 A1

Industrial Structures: In addition to civil opportunities, there is renewed interest in the use of wood for industrial applications. With new materials and systems being adopted, such as cross-laminated timber, previously unforeseen applications for wood are emerging. For example, several designs have been developed for towers for large, industrial wind farm installations (left) that can be made from wood panels. Of course, issues such as external protection and internal fire-resistance provide opportunities for treated and preserved wood manufacturers.

Conclusion

British Columbia's Wood First Act was developed to demonstrate leadership in applying innovative wood solutions. While the direct targets of the legislation were government funded buildings in BC, the true aim is to broaden the impact. It also includes non-government projects, projects in other jurisdictions in Canada, and around the world. Finally, it aims to increase the presence of wood building material and systems beyond just building construction. All of these effects will provide increased opportunities for the wood preservation, treatment and modification industry.

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