Wood, Concrete, Steel: Competitive Environment for British Columbia Wood and Wood Products in North America

Forestry Innovation Investment

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Fleishman Hillard International Communications

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1.0 Executive Summary

In the highly competitive North American building products marketplace, wood, steel and concrete are actively marketed. The continuing trend toward greater appreciation and adoption of green building standards and practices should position wood products favourably. Wood maintains a dominant position in the residential construction sector and is making efforts to expand into market segments where steel and concrete are more established.

This report reviews the messaging and approaches to marketing undertaken by the wood products, steel and concrete industries. All promote their products' respective qualities and all have adopted sustainability messaging into their marketing. Key findings of this report include:

- Sustainability and product quality messages developed for the marketplace by the steel and concrete industries have also been integrated into messaging for influencers shaping the adoption of green building standards. The marketing approaches of the steel and concrete industries appear equally geared to standards development as they do to audiences such as architects, builders and engineers.
- Steel, perhaps as a result of its more consumer-based and advertising-driven marketing initiative several years ago, tells its story in comparatively more simplistic terms which appears to have some resonance in the marketplace. Concrete too tells its story in a straightforward fashion. This is in contrast to wood – particularly when considering Life Cycle Analysis (LCA) factors and forest certification – which has a more "complicated" message to convey.
- The comparative basis by which to consider the sustainability and benefits of one product over another has not been established. This has been an advantage for steel and concrete, which can both point to attributes such as recycled content to counter any number of attributes advanced by wood. If sustainability is not an issue, fall-back messaging for steel and concrete is always greater durability and familiarity compared to wood. This situation may change with the emergence of a generally accepted LCA standard and may explain why steel and concrete are actively lobbying to influence LCA standards.
- While wood promotes its intrinsic qualities as a natural substance, steel and concrete promote the progress made in their production processes, namely reductions in the GHG emissions associated with manufacturing. These claims may be more difficult to make over time for the steel and concrete sectors as continued GHG reductions become more difficult or costly. In the longer term, this represents a potential weakness in both steel and concrete messaging and a significant advantage for wood.
- The energy efficiency of buildings is a critical factor in green building standards. The forest products industry will benefit from messaging that promotes the contribution wood makes to the overall energy performance of buildings.

Research on architects' preferences shows that while green building trends or requirements will influence architects' specification of different building materials, other factors such as

aesthetics, familiarity and ease of use continue to be primary considerations, and will continue to be important factors in successfully marketing to this audience. For the wood products sector, sustainability messaging must support and fit within the full set of practical considerations that guide specification and ultimately influence a buying decision.

Concrete and steel are actively positioning themselves in the debate over incorporation of Life Cycle Analysis in green building standards. Wood is well-positioned, but should not assume that it will 'win' this debate and will need to be solidifying its positioning on LCA and doing what it can to influence the development of LCA measurements that will be introduced into green building standards such as LEED.

Efforts to compare the effectiveness of wood, concrete and steel industries' marketing efforts is difficult when there is no obvious objective resource whereby the three industries can be compared. A key recommendation of this report is for FII to consider undertaking a more comprehensive and regular assessment of wood marketing and messaging in comparison to steel and concrete.

2.0 Introduction & Approach

Forestry Innovation Investment (FII) is a provincial agency that promotes British Columbia's forest practices and products around the world. FII's mandate is five-fold:

- Position British Columbia as a global supplier of world-class, environmentally friendly forest products.
- Maintain, create and diversify demand for B.C. forest products in Canada and in key world markets.
- Break down non-tariff trade and market barriers to ensure opportunities for B.C. forest products.
- Work with the forest industry to promote B.C.'s forest products and forest management to the global marketplace.
- Help ensure that the forest sector, through product development and strong international sales, continues to be a leading contributor to the B.C. economy.

In keeping with its mandate, FII operates programs including support for market research. In this context, FII has retained Fleishman-Hillard (Canada) Inc. ("FH") to provide market research and analysis of the marketplace for wood products in North America as this pertains to competing building products. Specifically, FH has been retained to report and provide analysis of how wood is positioned with respect to steel and concrete, with a particular emphasis on perceptions and definitions of "sustainability" as a differentiator between these various building products.

This report undertakes to identify:

- Methodologies and tactics used to promote wood, concrete and steel in North America. In preparing this report, emphasis has been placed on examining how concrete and steel are marketed. A summary of wood marketing - a subject about which FII has extensive knowledge and research – is provided for comparative purposes; and
- Key messages and positioning statements contained in the respective marketing initiatives for concrete and steel which then may be compared to wood.

This report also undertakes to assess:

- The degree to which specific tactics and messages employed by organizations marketing steel and concrete are effective; and
- How marketplace dynamics and customer preferences have influenced the direction of various marketing campaigns and may potentially affect future marketing strategies.

Concrete and steel compete with wood products in a number of market categories in North America. While this report addresses the marketing of building materials relative to both residential and non-residential construction throughout North America, research has been focused on multi-family buildings up to six storeys, institutional buildings, roofing and other major structural elements of buildings, with a particular emphasis on jurisdictions such as British Columbia, California, Illinois, Massachusetts and Georgia.

Greater understanding of how products are marketed provides FII and the B.C. wood products industry with information that may assist in better promotion and marketing in these segments. Analysis of where steel and concrete are positioned to be competitive with respect to certification and green building standards is also provided in this report.

2.1 Summary of methodology and sections of the report

Online research focused on review and analysis of the websites and online marketing properties of major trade and industry associations as well as manufacturers or producers in the wood, concrete and steel sectors; architecture, engineering and building trade websites; and, government websites containing information pertaining to land use, building and development policies. A list of organizations whose online materials were surveyed for this report can be found in Appendix A.

A variety of publications targeting the architecture, engineering and building trades were reviewed for both editorial coverage and advertising. A list of publications is provided in section 5.1 “Advertising”, below.

Media analysis included key word searches for editorial coverage in North American trade and mainstream media; Google news searches online; and, blog and social media analysis focusing on popular green building or sustainability-focused websites (see Appendix B for list of blogs and websites).

FH interviewed various forest product industry representatives and consultants in both the U.S. and Canada, including individuals representing organizations affiliated with FII. In addition, interviews were conducted with representatives of the American Institute of Architecture, the U.S. Green Building Council and McGraw-Hill Construction. An email survey was conducted with participants in the BC Wood Product Showcase exhibit to gauge opinions on the effectiveness of tradeshow promotions and messaging by the wood, concrete and steel sectors.

3.0 Context and background

3.1 Summary of factors influencing North America as marketplace for wood products

"The latest green building initiatives provide a clear indication that the trend toward green in building construction is not temporary and that demand for recycled-content, re-used/refurbished products, regionally-sourced materials, and certified wood is likely to grow in the future."
Potential Game Changers in Green Building
Dovetail Partners Inc., April 2010

While competing with cement and steel in various categories, wood commands the largest share of the market in the residential category in both Canada and the US. The wood industry actively markets to maintain and grow its share of the residential market where it is traditionally strong. Growth in institutional, multi-family, structural and applications markets bring the wood industry far more into competition with steel and cement where more often these products are seen as the incumbent, "conventional" materials. Research available to FII (and in turn FH) has indicated that in the non-residential and multi-family sectors, measures of the attitudes and perceptions of wood among decision-makers has been improving. This is obviously positive, but still largely reflective of a willingness to "know more and hear more about the product" on the part of decision-makers rather than a wholesale breakthrough in market share.

Where wood meets resistance in the marketplace is where it is seen as an "unconventional choice" and where there is little external impetus to challenge the thinking of decision-makers to consider wood as a straightforward alternative to steel and concrete.

Other barriers to greater market access in non-residential segments of the marketplace include:

- Limited familiarity which can affect skills available to design and build structures;
- Perception that if wood is unconventional, the product will also be expensive both to buy and use; and
- Concerns about durability, particularly in some US southern climates, compared to steel and concrete.

Architects, engineers and builders responsible for materials selection are guided by: preference and experience with the materials they most commonly use; codes and regulations; and their

respective values and taste. Green Building standards and preferences influence the selection of materials greatly, but this is a factor of trending values, not necessarily specific actions of environmental groups or a requirement to meet clear environmental goals such as a fixed percentage reduction of greenhouse gas emissions. The objectives of green building are, according to many builders, foremost to meet market demand; to be "seen as green" and in many cases save on energy costs. In this respect, concrete, steel and wood all have a "green story to tell", whereby no one material is fundamentally disqualified from consideration.

According to opinion research conducted by Ducker Worldwide (March 2010), architects, engineers and builders report using the same amount of wood to comply with green building requirements as previously under different standards. Some results suggest that green building may even be reducing wood usage. Contractors indicate that green building requirements may actually be leading to a decrease in wood usage, citing that compliant wood (e.g. third-party certified or locally sourced) is more expensive, harder to find and more difficult to "prove". In other words, outcomes of green building construction can be achieved regardless of the materials used, according to some builders.

According to Ducker Worldwide, "… familiarity with green building standards and rating systems is highest among architects, and architects attribute greater importance to factors related to green building than do engineers and contractors. At the same time, the ability of green attributes to directly influence material selection remains mixed. Engineers and contractors rank 'energy efficiency', 'environmentally friendly' and 'ability to meet green building requirements' as among the least important attributes affecting their decisions. Architects place higher importance on these factors. But across all audiences and regions, the following attributes were most frequently cited as the primary factors in material selection: ability to meet seismic requirements, ability to meet fire requirements, ability to meet static/dynamic load requirements, and quality products.

3.2 LEED Standards

Much effort to increase wood adoption (and overcome biases potentially unfavourable to wood and other conflicting values in the marketplace) has been directed at amending and improving codes and standards. From 2008 to 2009 there was a 200% increase in the number of non-residential projects applying for LEED status in the US. In 2009, LEED initiatives were found in 45 US states (legislation, executive orders, resolutions, ordinances, policies and incentives), according to the US Green Building Council (USGBC).

In North America, LEED is the unquestionable source of guidance on green building and the role of the USGBC is generally welcomed among building professionals. Given the prominence of LEED, and the emergence of codes and standards such as CALGREEN (California Green Building Standards Code) and IGCC (International Green Construction Code), factors affecting the adoption of wood such as locally sourced materials, reused materials, recyclability, certification for wood products should only become more commonly accepted.

An example of stimulus to greater use of wood has been the adoption of "wood first" policies. Governments in BC and Quebec for example, have announced policies encouraging use of more

wood. The BC Government "Wood First" policy requires wood to be the primary building material in all new public buildings. The province's building code has also been changed to allow six-story multi-family residential buildings, up from four stories.

Another positive step forward in the greater adoption of wood is the growing recognition of life cycle assessments. LEED has launched a pilot project to incorporate LCA into all its standards (structural/envelope assemblies will be evaluated using an approved LCA impact calculator, with credits awarded depending on the results). This has triggered opportunities for building material suppliers to influence the design of LCA tools. This is important for the forest products industry because wood typically performs better in the calculation of LCA impacts when compared to steel and concrete. However, the concrete and steel industries are engaging in advocacy and marketing activities to position their products in the context of life cycle – for example, by arguing that concrete does not deteriorate as quickly as wood and therefore has a much longer 'lifespan' that should be taken into account in the full life cycle analysis. The steel industry recently commissioned a study in which researchers performed a life-cycle assessment of a steel-framed building relative to a concrete-framed building using case studies of two similar structures in the same geographic location. The study, which has been promoted by the steel industry but not made available publicly, was recently profiled in *GreenSource* magazine. Excerpt:

> *Researchers compared two healthcare facilities in Omaha, Nebraska, built within a few years of one another, one with a steel frame and the other framed in concrete... Researchers found that the steel-framed building outperformed the concrete-framed one in all categories except primary energy demand, and the concrete production process was the largest contributor to the environmental impact of both framing systems.*

3.3 Role and Influence of Environmentalists

Environmental Non Governmental Organizations' (ENGO) efforts targeted at the wood products industry appear to have declined in recent years. This is because ENGOs have shifted criticism of the industry from wood producers to other forest products sectors, such as pulp and paper, and certification programs have taken on wider acceptance. The impact of the aggressive anti-forestry campaigns of the 1990s and early 2000s has nonetheless created lasting negative perceptions about wood among consumers and professionals in the building trade. In an interview with the head of public affairs for the Architectural Institute of America conducted for this report, he commented that wood continues to have a negative perception because people think back to the ENGO campaigns showing images of clear cut forests. Representatives of Wood Works also commented that negative perceptions persist. The legacy of ENGO activism combined with certification, which steel and concrete do not require, represents a differentiating factor in the marketplace between steel and concrete on the one hand and wood on the other.

ENGO activism has also been highly influential in the certification process. FSC has been influential with the USGBC which has caused other certification schemes, like SFI, to be shut out of LEED to date. (A current initiative of the USGBC to study inclusion of other forest certification

programs is now underway.) FSC's current "monopoly" within the LEED system affects the availability of wood where LEED standards are to be followed and adds a complexity to the specification of wood for certain applications not faced by either steel or concrete, which have far fewer variations to begin with.

Steel and concrete are not without their respective environmentalist detractors. Climate change is a focus for North American ENGOs and certain groups have taken on industries which are large CO2 emitters including the cement industry. Tactics have tended to be focused on encouraging governments to adopt more stringent emission regulations and air quality standards rather than market and "product-based" campaigns. EarthJustice and the Sierra Club fought the steel industry in 2003 on emissions. More recently, Earth Justice has been involved in advocacy relating to emissions regulation targeting cement kilns in the U.S. (e.g. August 9, 2010 press release on new EPA rules).

The Natural Resource Defence Council (NRDC) promotes the more efficient use of wood and is careful not to recommend alternative building products outright. In the Council's handbook available online entitled *"Efficient Wood Use in Residential Construction - A Practical Guide to Saving Wood, Money, and Forests"* NRDC describes how wood-efficient home building (i.e. doing whatever possible to use less wood) is a "win-win" opportunity for building industry professionals and the environment: "Building industry professionals can save money and time by building more efficiently. The environment wins, too, since saving wood in residential construction conserves forests... "

The NRDC and other groups have begun to promote "wood recycling". The NRDC recently promoted the renovation of its California office on its website and printed materials. It highlights the use of only FSC-certified wood or reclaimed wood, and mentions substitution of wood with other flooring and framing materials – including cement and Chinese bamboo. Publication: http://www.nrdc.org/cities/building/smoffice/guides/materials.pdf.

3.4 Strategic considerations

Price and availability are always critical factors in a product's adoption in the marketplace. In this respect, wood may face a comparative advantage in the near term as the price of steel and concrete did not fall as far as wood during the recent recession. Government stimulus spending may have contributed to keeping building steel and concrete prices relatively buoyant compared to wood.

Over the longer term, the evolution of green building standards and values is expected to continue. Outside of residential construction (where steel is attempting to gain market share through greater adoption of products such as light weight framing and steel roofs), wood will need to overcome:

- Perception as an "unconventional product" where the experience with steel and concrete is greater on the part of engineers, architects and builders.

- Prioritization of "other values" – potentially where steel and concrete are seen to have an advantage such as durability – ahead of sustainability values.
- The willingness of decision-makers to accept that all products have sustainability qualities, but the overall performance of the structure takes precedence over the building materials themselves.
- An active lobby to neutralize (or overcome) the potential of wood in a marketplace where LCA becomes more widely recognized.
- On-going legacy of market-based ENGO campaigns affecting the reputation of wood.

4.0 Messaging and Positioning

The key messages employed by the wood, concrete and steel industries over the past five years have evolved in step with the growing prominence of green building. Positioning products around attributes and values associated with sustainability has become more and more common, however research shows that most product associations and manufacturers selling into the North American marketplace – particularly steel and concrete, and less so wood – have also continued to promote messages that relate to product aesthetics, durability and ease of use. This mirrors research reference above, which indicates that these values continue to drive product selection.

The following assessment of key messages and positioning of wood, concrete and steel in North America is based on content from a variety of sources including advertising, websites, industry-sponsored educational materials and events.

4.1 WOOD

"Wood is the perfect green building material because it is renewable, stores carbon that reduces greenhouse gases, and is energy efficient."
American Wood Council homepage

The forest product industry in North America has long promoted wood as an attractive and renewable building material. Following aggressive anti-forestry campaigns of the 1990s and early 2000s which criticized harvesting practices, the industry moved to a messaging platform that not only sought to promote the inherent environmental benefits of wood, but also to explain the benefits of forest management and describe the efforts of industry to ensure sustainable forestry practices are followed.

Appreciation for wood among architects, engineers and other building professionals has persisted, in spite of environmental activist campaigns, however evidence suggests that there are lingering negative perceptions associated with wood. The positioning and messaging of wood product associations, producers and manufacturers is responding to these legacy perception issues as well as a burgeoning green building movement in which standards do not necessarily favour wood over other materials such as concrete and steel. The messaging platform for wood products is fairly uniform across different organizations and companies

engaged in sales, marketing and communications aimed at building professionals. Key themes used to promote wood include aesthetics, natural and renewable, and energy-efficient. Nuances in industry messaging exist where individual producers or manufacturers highlight specific forest certification schemes such as FSC or promote attributes of particular applications and features.

The North American wood products industry's messaging can be summarized as follows:

Key messages	Secondary/supporting messages, context/background	Messages focused on competing products
Wood is a natural material, from the earth		
Wood is renewable and recyclable		
Wood is durable		
Wood is energy-efficient – it has naturally insulating properties		
Wood from well-managed forests is sustainable	• "Less than half of one percent of Canada's managed forests are logged in any year" / "A fraction of one per cent of B.C.'s forests is logged each year" • "The U.S. and Canada have about the same forested area as they did 100 years ago" • "North American forestry regulations are among the most stringent in the world" • Producers who source from FSC-certified forests will reference FSC in key messages	
Sustainable forestry and forest products help to reduce or prevent greenhouse gases. Wood products store carbon absorbed by trees.		
Life Cycle Assessment – when you calculate the energy required to manufacture, transport, construct, maintain and dispose of building materials, wood is superior to steel and concrete.	• This message has gained prominence recently as green building standards and codes develop, and the debate continues over how LCA may be incorporated into prominent standards like LEED • More common for lumber, less apparent among composite material producers	• Concrete and steel are energy intensive and produce significant CO2 emissions in the manufacturing process.

Competitive positioning

As noted in the table above, the forest products industry is increasingly positioning wood in comparison to concrete and steel in terms of Life Cycle Assessment (LCA). Wood has a particularly strong advantage in the calculation of embodied energy, as compared to steel and concrete whose environmental footprint for manufacturing is significantly larger. The following passage from the booklet *Tackle Climate Change – Use Wood* (September 2009), produced by the BC Forestry Climate Change Working Group and the California Forestry Association, puts wood in an LCA context: "Life cycle assessment studies show that wood has significantly less embodied energy than steel or concrete – which refers to the energy needed to extract, process, manufacture, transport and maintain a material or product... Compared to the alternatives, wood buildings are responsible for less greenhouse gases, air pollution and water pollution, and require less energy across their life cycle." Analysis of various forest product association and manufacturer websites shows that messaging related to LCA is not uniform across the industry. While the key ideas behind LCA are often promoted (particularly embodied energy), descriptions in marketing materials vary from simple to technical.

Industry stakeholders interviewed for this report suggest that as LCA becomes increasingly adopted as a measurement tool within green building standards, wood will need to be ready to confront efforts by steel and concrete to even the playing field by suggesting that their products have life cycle benefits similar to wood because concrete and steel last longer, both in terms of the life of a building and, with steel, in terms of 100% recyclability.

Wood messaging strengths

In the context of the growing opportunity around green building, the forest product industry has significant marketing and communication opportunities. As the marketplace for green building evolves due to growing consumer demand and regulatory changes which mandate sustainable building practices, the forest product industry will benefit from continuing to strongly position wood as a natural and renewable material. This message is simple, straightforward, and highly credible.

A survey by Harris Decima of architects, municipal officials and building professionals reveals that the primary motivator for building green is to achieve greater energy efficiency in the finished structure. Under the LEED standard, achieving gains in energy efficiency can lead to a project earning significant points, for both new construction and renovations. Messaging which positions wood as an insulating material that improves energy efficiency will continue to be important.

Messages related to forest management, and specifically independent certification of forestry, lend credibility to wood as a green building material. This should afford wood a particular advantage in comparison to the steel and concrete industries, which have no third-party verification of their sustainability claims. Opinion research indicates that key audiences accept that wood is a 'green' material as long as it comes from a sustainable source (Harris Decima study).

Wood messaging weaknesses

While the merits of wood are compelling when viewed in terms of life cycle assessment, the drawback of relying on LCA as a key message is that it requires a degree of detailed explanation, and may not be easily communicated in a marketing vehicle such as advertising. The LCA message, along with messages relating to carbon sequestration and the benefits of wood in the context of climate change, are more frequently used in educational materials and other marketing vehicles in which there is opportunity to present technical information (for example, continuing education programs). One forest industry researcher interviewed for this report commented that wood's messaging around sustainability has tended to be quite detailed and technical, whereas architects and builders appreciate simpler messaging. Another commented that "wood is too focused on certification rather than differentiation from other materials." A U.S.-based forest product marketing expert commented that the wood industry will nonetheless need to continue communicating and promoting evidence of the 'green' credentials of wood in response to ongoing criticism from competing material suppliers and environmental activists.

Opinion research suggests that the positioning of wood as a highly durable material may not be fully accepted among key audiences in the building professions. Similar sentiments were gleaned in FH's research for this report.

4.2 CONCRETE

"After water, concrete is the most widely used material in the world. Concrete is literally the foundation of our homes, communities, and cities. As such it has a critical role to play in the future success of sustainable development... Concrete's resilience and versatility align with sustainable values of stewardship and stability."
sustainableconcrete.org

As evidenced by the formation of sustainability-focused industry marketing groups such as the US Green Concrete Council – which plays off the influential US Green Building Council – the North American cement/concrete industry is making a collective 'green' push in its messaging. Although concrete has a multi-faceted sustainability story to tell, the industry is focusing on recycled content and the reduction of greenhouse gas emissions – namely CO2 – in its marketing efforts. Concrete is being positioned as both an efficient use of resources and a durable material that does not require maintenance.

Key points in the industry's sustainability messaging are as follows:

Key messages	Secondary/supporting messages, context/background	Messages focused on competing products
The recycled content of concrete includes a wide range of materials. (For example, fly ash or sea shells)	Recyclable – concrete is touted as being reusable after demolition, however this message is less apparent than positioning the product as containing recycled material.	

Concrete is adaptable – by changing the chemistry of concrete, producers can adjust the material's strength and durability.		Concrete is designed to be durable for the long term. In comparison, steel has to be coated to prevent rust, and wood is susceptible to pests and mould.
CO2 emissions have been reduced by replacing cement with fly ash – a byproduct of coal-fired power plants – during production.		
The concrete industry has reduced energy consumption by 37.6 percent from 1972 to 2008.	Tying into the climate change message, the industry claims to have reduced corresponding CO2 emissions by nearly the same amount over the same period. (see above)	
Concrete buildings are energy efficient.	Concrete can reduce heating costs in winter and its light colour reflects sun, resulting in reduced reliance on air conditioning in summer.	
Permeable concrete (typically associated with pavers and sidewalks) reduces storm water runoff – keeping pollutants out of the water system.		
LEED credits can be achieved using concrete, due to its recycled content and incorporation of locally sourced materials.	The average distance between manufacturing and job site is claimed to be 22.9 km. The USBGC logo is included in many of the industry's advertising materials.	
Concrete scores well on Life Cycle Assessment.	Concrete is made 'locally' – which results in reduced transportation emissions – and has a large thermal mass which improves energy efficiency.	

Many of the concrete industry's messages are promoted by the influential Portland Cement Association, which positions concrete as offering a "wide range of sustainable and comprehensive environmental benefits", as outlined on the association's 'Top Ten Reasons To Use Concrete for Sustainable Design' webpage. The association boasts of being "among the first to tackle the issue of climate change", and of remaining "at the forefront of developing global climate change policies and improving the manufacturing process."

With advocacy groups such as the American Concrete Institute as members, the Concrete Joint Sustainability Initiative (CJSI) is a multi-association industry coalition that carves out concrete's role in green building by positioning concrete as recyclable and energy efficient. Example proof points include:

- In the U.S., 140 million tonnes of concrete are recycled annually.
- Compared to 1972, it takes 37 percent less energy to produce a ton of cement.

In 2009, the American Concrete Pavement Association published a concrete pavement recycling guide, a 102-page technical resource that describes "concrete pavement recycling as a proven technology and one that offers an alternative source of aggregates."

Despite concrete's progress in reducing CO2 emissions, in 2010 the industry lost a battle with the U.S. Government when the EPA mandated a 92 percent reduction in mercury and fine particulate emissions from cement kilns. According to the Portland Cement Association, the new rules will cost the industry "several billions of dollars" to become compliant.

Competitive positioning

In general, comparative analyses of concrete's green claims to those of wood and steel are generally absent in the industry's messaging – possibly because few substitutes exist for structural applications in large buildings. However, the Concrete Joint Sustainability Initiative references a 1994 report commissioned by Natural Resources Canada[1] – featuring a 'Resource Impact Index' which assesses the impact of extracting raw materials – to make the following comparisons between concrete, steel and wood:

Resource Impact Index		
Concrete	Aggregate quarrying	1.00
	Limestone quarrying	1.50
Steel	Iron ore mining	2.25
Wood	Boreal timber harvesting	2.50
	Coastal timber harvesting	3.25

When it comes to extracting resources, concrete claims a clear benefit over steel and wood. Additionally, the industry promotes limestone – a key ingredient in cement production – as an abundantly common resource.

Durability is a consistent part of concrete's messaging, and an area where the industry tends to directly compare concrete with wood. Recently, the Portland Cement Association announced an initiative aimed at reinforcing concrete's durability claims, while continuing to position the product as a green building material. In partnership with the Institute for Business and Home

[1] *Assessing the Relative Ecological Carrying Capacity Impacts of Resource Extraction*, Athena Sustainable Materials Institute, August 1994. The report is currently available online at SustainableConcrete.org and on the Athena Sustainable Materials website. The report is not currently available on the website for Natural Resources Canada.

Safety, PCA has developed new criteria for "high performance" building requirements that it says will allow local governments to adopt green building codes that also provide for disaster-resistant buildings. The High Performance Building Requirements for Sustainability 2.0 are intended to amend and append the International Code Council International Building Code (IBC).

In the area of Life Cycle Assessment, concrete is positioned as a clear winner over wood, which is typically only assessed over a 25-year life span whereas concrete structures are promoted as having a longer lifespan.

Concrete messaging strengths

When it comes to promoting sustainability, the concrete industry relies on a variety of messages: recyclability and reusability, CO2 reductions, permeability, LEED standards, energy efficiency, Life Cycle Assessment performance and energy efficiency. Thanks to steady improvements in CO2 reductions since the 1970s, the concrete industry has a quantifiable story to tell in terms of embodied energy.

As the USGBC's LEED certification program continues to gain prominence, concrete's ability to demonstrate its applicability within LEED standards and to promote examples of award-winning "green" concrete buildings will continue to be valuable marketing tools. Also, concrete is adaptable. Unlike steel, which has to be coated to prevent rust, and wood, which is susceptible to pests and mould, changing the chemistry of concrete allows producers to adjust the material's strength and durability.

Concrete messaging weaknesses

Other large, resource-intensive industries – namely chemical and fossil fuel producers – generate more greenhouse gas emissions, however concrete production is nonetheless a significant source of CO2. Although climate change remains a topical issue, major improvements in this area have largely been achieved by the concrete industry – bringing into question the industry's ability to continue leveraging this message. A senior executive with a U.S.-based forest product association who was interviewed for this report commented that the creation of groups like the US Green Concrete Council (whose name is similar to the US Green Building Council) may ultimately been seen as 'greenwashing'. Further, new EPA guidelines around the release of airborne pollutants threaten to place a heavy financial burden on concrete manufacturers.

4.3 STEEL

"If all industries were as interested in the environment as steel, the habitats for both animals and mankind would be dramatically improved."
Jan Hartke, former Executive Director, EarthVoice – from *Building a Sustainable Future*, part of the American Iron and Steel Institute's report to the 111th U.S. Congress (2008)

While steel continues to emphasize its core strengths in its messaging – durability, strength, versatility and long-term cost effectiveness – its primary key messaging now pushes

sustainability. This is driven largely by the growing prominence of the LEED rating system and other green building standards which promote the use of materials with high levels of recycled content. Where steel goes further than other recycled products is by adding that it is also 100 per cent recyclable, a term which the industry is heavily promoting.

Overall, the steel industry is very clear, simple and forward-looking in its sustainability messaging. While steel is not necessarily innovative in its product offering, sustainability is now synonymous with innovation and the industry is successful in recognizing and benefitting from this sentiment.

The American Iron and Steel Association (AISI) views steel as the future for U.S. infrastructure that they say is in crisis. AISI's website states, "in the 21st Century, steel is still revolutionizing the way we live. It is the high-strength, lighter-than-plastic frames for eyeglasses; it's the stronger, more durable frame in housing; it's the high-tech alloy used in the Space Shuttles' solid fuel rocket motor cases; and it's the precise surgical instruments used in hospital operating rooms."

The North American steel industry's messaging can be summarized as follows:

Key messages	**Secondary/supporting messages, context/background**	**Messages focused on competing products**
Steel is strong and durable		
Steel is the most recycled material on Earth	"More than aluminium, paper, glass and plastic combined"	
Steel is cost effective		90 percent of North America's old-growth forests are already being harvested, so wood's cost has increased while its overall quality and availability have dwindled
Steel's functionality crosses all industries – from healthcare to aerospace to construction	Within the U.S., steel is often positioned as an important 'homegrown' product. The industry, which engages in significant lobbying and advocacy efforts around trade and environmental policy, promotes its long history of providing jobs and opportunity in America.	
Steel is resistant to fire, insect damage and extreme weather conditions.		Implied opposites to wood's inherent characteristics
Steel is relatively light-weight, affording cheaper and more environmentally-friendly		

transport		
Steel framing contains a minimum of 28 per cent recycled steel and is completely recyclable at the end of its long, reliable life	Virtually all hazardous waste once generated by the steel industry is now being recycled for recovery for beneficial use	
The steel industry has exceeded Kyoto accords for energy efficiency improvement by more than 240 per cent	"If every individual and segment of the U.S. economy achieves the same energy improvements as the steel industry, the U.S. would exceed Kyoto accords" "Only the North American steel industry has reduced energy demands while still increasing production"	
Life Cycle Analysis demonstrates that steel offers superior environmental benefits due to relatively low production energy, recyclability, structural efficiency and process efficiencies the industry has achieved		
Greenhouse Gas Emissions per ton of steel shipped have been reduced by nearly 45 per cent since 1975	Air and water emissions are 90 per cent lower today than 10 years ago More than 95 per cent of the water used for steelmaking is recycled--often returning water cleaner than when taken from its source	

Competitive positioning

The steel industry does not generally compare steel to wood in its messaging. Where steel does address wood, the messaging is typically focused on fire, pest and mould resistance, or on criticism of wood related to harvesting old-growth forests.

It is clear that the steel industry is increasingly taking on wood in the residential construction market, by highlighting steel's cost and environmental advantages for builders and homeowners. Two claims made in steel's marketing materials that demonstrate a desire to grow in the residential construction market include:

- "With wood being the traditional material used in residential construction, 90 per cent of North America's old-growth forests are already being harvested and wood's

cost has increased while its overall quality and availability has dwindled." From the fact sheet 'Steel: The Clear Cut Alternative for Building Homes', Steel Recycling Institute

- "A typical 2,000 square foot home requires about 40 to 50 trees, about an acre's worth, to build with wood. With steel, only the equivalent of about six scrapped automobiles is needed." From the Construction page on the website Sustainable-Steel.org

Steel messaging strengths

Steel's core strength is the simplicity and clarity in its sustainability messages. Steel strongly differentiates itself from other products by emphasizing that steel is made of recycled raw materials and is also 100 per cent recyclable.

According to a North Carolina-based forest product industry representative interviewed for this report, "the steel industry has learned to play the marketing game very well. I've noticed many of them now promote that '100 per cent of our products contain recycled content" rather than 'our products contain 25 per cent recycled raw material'."

Another strength of the steel industry's messaging is its forward-looking focus – specifically, positioning the product in a confident manner as contributing to a more sustainable future. For example, the use of the tag line "Steel – The New Green," in recent promotions and events.

Steel messaging weaknesses

When steel does come under scrutiny for its possible "green washing" and simplified focus on recycling, the industry is strategic and proactive in responding to criticism; for instance, by emphasizing the improvements made by the industry in reducing emissions from manufacturing.

The steel industry is successful at combating its areas of weakness by emphasizing industry-wide improvements in energy efficiency and emissions, and is careful not to draw comparisons to wood in this respect. It is noted, however, that areas where steel still needs to improve include; efficiency of fabrication shops, water use and pollution, and energy intensive recycling.

An area of potential weakness for the steel industry (similar to concrete) is the lack of a sustainable certification standard to 'back up' the industry's green claims. According to a California-based forest product industry representative interviewed for this report, "there is no way for a specifier to ensure that one steel product came through a more sustainable means than another like there is with wood certification." Currently, however, the lack of sustainability certification for steel products does not appear to be hurting the industry, nor is there evidence that building professionals and authorities are demanding it.

4.4 Summary assessment

Wood, steel and concrete have all been successful in developing sustainability and product quality messages for a marketplace that will only continue to adopt green building standards. Steel, coming off a more consumer-based and advertising-driven marketing initiative several years ago, tells its story in comparatively more simplistic terms which appears to have some resonance in the marketplace. This is in contrast to wood – particularly when considering LCA factors and forest certification – which has a more "complicated" message to convey.

The comparative basis by which to consider the sustainability and benefits of one product over another is a moving target. This has been an advantage for steel and concrete, which can both point to attributes such as recycled content to counter any number of attributes advanced by wood. If sustainability is not an issue, fall-back messaging for steel and concrete is always greater durability and familiarity compared to wood. This situation may change with the emergence of a generally accepted LCA standard.

Steel and concrete promote the reductions they have made in the GHG emissions associated with materials production. These claims will be more difficult for the steel and concrete sectors as continued GHG reductions become more difficult or costly. In the longer term, this represents a potential weakness in both steel and concrete messaging and a significant advantage for wood. Where wood can make gains to build recognition for the contribution its products make to the overall energy performance of buildings, it will also make gains.

5.0 Marketing methodologies

Just as the wood, concrete and steel sectors have evolved their messaging and positioning to respond to market trends, each sector has also continued to expand and refine the mix of marketing tactics used to influence building professionals. For the purposes of a comparative analysis, this report reviews the five primary methodologies employed by building material suppliers for marketing purposes: advertising, earned media, tradeshows and conferences, digital (including social media), and education. In each of the subsections that follow, methodologies are defined and discussed, followed by descriptions of specific tactics used by the wood, concrete and steel sectors.

5.1 Advertising

In the late 1990s, the steel industry initiated a broad campaign aimed at promoting the innovative and sustainable properties of steel to consumers and professionals. Anecdotal evidence suggests the campaign, which encouraged builders to "save a tree and buy steel," has had a lasting impact in positioning steel as an innovative building material. Several forest product experts interviewed for this report pointed to the steel campaign as the most significant and impactful advertising ever sponsored by a building material supplier. More recently, steel has scaled back its advertising activities significantly, and neither wood nor concrete has ever waged a campaign of similar scope.

In the past two years, building material advertising programs – which tend to appear in print magazines as well as at events and tradeshows – have largely been sponsored by individual manufacturers, and regional or product-specific trade associations. In response to the growing prominence of green building, sustainability messaging is evident in advertising campaigns across the wood, steel and concrete sectors.

Research and analysis conducted for this report focused on print advertising, with an emphasis on those campaigns which include sustainability messaging. A total of 46 print advertisements were reviewed for this report – 35 from 2010, eight from 2009 and three from 2008. Sources were trade publications popular with architects, engineers and builders in North America: *Architectural Record*, *Architect*, *Canadian Architect*, *Structure*, *Green Home Builder*, *GreenSource*, *American Builders Quarterly*, *Buildings*, and *Constructor*.

5.2.1 WOOD

Wood is actively advertising. Among wood product associations and marketing organizations, Wood Works, Forestry Innovation Investment and Western Red Cedar Lumber Association appear to be the most active. In many of the key publications surveyed, wood-related ads were placed by associations, individual producers (lumber) as well as value-add manufacturers of products such as flooring.

FH research shows that many wood-related ads employ a sustainability theme, either in words or images, however a consistent sustainability message is not evident across the advertisements surveyed. The following are examples of advertisements showing the types of messages typically used by the forest product industry (copies of advertisements are included in Appendix D):

- Wood is a natural material from sustainable sources / environmentally friendly.
    - FII (Naturally Wood): “We think about the forests behind our wood products so you don’t have to.”
    - Bear Creek Lumber: “Using our wood as a building material gives you an alternative to fossil fuel based products, in turn reducing your environmental footprint.”
    - G.R. Plume Company: “Formed by nature. Crafted by man.”
- Forest certification references (by name and/or use of logos – mostly commonly FSC).
    - Accoya: “Wood Without Compromise. ... All Accoya wood is produced from well-managed sustainable sources including FSC, PEFC and other regionally certified woods.”
    - Boise Cascade Engineered Wood Products: “The #1 Way to a Better 2010: FSC Chain-of-Custody Certification”

  - Collins Wood: “What’s in a name? A promise. Collins – the first name in FSC-certified forest products.”

- Aesthetic qualities of wood.
  - Western Red Cedar Lumber Association: “Beautiful, versatile, sustainable. Western Red Cedar.”
- Durable and sustainable.
  - Prodema – Made to Last Wood Products: “Our dream - more sustainable architecture. Our reality - durable, eco-efficient products.”
  - Wolmanized Wood: “Real wood protected by preservative treatment. Renewable source. Domestic production. Plentiful supply. Carbon sequestration. Low-energy manufacturer. Extended life.”
- Ease of use. Low cost.
  - Wood Works: “Design and building support for the non-residential marketplace... resources that can help you design and build non-residential structures more easily and at less cost.”

While some wood advertisements rely on images of trees and forests to express that wood is a natural material, the majority of advertisements found in FH research contain images of wood ‘in use’ – buildings either completed or under construction, finishings, or product close-ups. Many of the advertisements rely on detailed text to convey sustainability messages. The use of the colour green for text, logos and backgrounds is common. Where forest certification is referenced in the ads surveyed, FSC is the predominant program cited either within text or through the use of the FSC logo.

5.2.2 CONCRETE

The concrete industry appears to be placing a significant emphasis on sustainability in its current advertising. In terms of print ads, individual manufacturers advertise more often than industry associations in the publications surveyed for this report. Themes and messaging in concrete ads tend to be expressed in simple terms – “concrete is sustainable” – but where details are provided, the industry focuses on the reduction of CO2 emissions, including the use of fly ash, as well as the energy-efficiency of finished buildings. Several concrete advertisements feature the USGBC logo and/or references to LEED, in order to associate concrete with green building.

When compared to wood, concrete advertising tends toward a simpler approach to associate the product with sustainability. For example, Holcim, a global supplier of cement, aggregates and ready-mix concrete, has recently taken out full page ads in architecture magazines to solicit entries for its Sustainable Construction Awards. The connection to green building is implied by the company’s sponsorship of the awards. In another Holcim ad, a soaring concrete structure is branded with an ‘Envirocore’ logo, and the ad contains a claim that the builder can “reduce your environmental footprint” with concrete.

A large part of concrete's sustainability story relates to the use of recycled material and related emission-reduction benefits through the use of fly ash. While concrete associations and producers will portray this message, advertising placed by fly ash producers is also helping the industry to draw attention to this aspect of concrete's green 'story.' For example, Headwaters Resources, a fly ash producer, advertises frequently in building industry publications, touting the environmental benefits of choosing concrete with fly ash content. Headwaters ads typically feature a USGBC logo and references to LEED.

While sustainability is a common theme in concrete-related advertisements surveyed for this report, the industry is also promoting durability and safety. In a recent ad by the Concrete Masonry Association of California and Nevada (CMACN), which doesn't feature any images of concrete, a man is shown against a green background saying, "Keep me safe and sound. Build my apartment with concrete block".

Similar to wood, there does not appear to be a recurring theme or tagline being used by associations and manufacturers to promote concrete. The following are examples of advertisements showing the types of messages typically used by the concrete industry (copies of advertisements are included in Appendix D):

- Concrete is sustainable.
    - Holcim – advertisement for the Holcim Awards for Sustainable Construction: "Develop new perspectives for our future."
    - Canadian Precast Concrete Institute: "Precast Concrete... Sustainable Structures for Tomorrow"
    - Quad-Lock insulating concrete forms: "Green-R: Solution for Sustainable Construction."
- Concrete is durable / safe.
    - Concrete Masonry Association of California and Nevada: "Concrete block apartment buildings are safe and sound."
    - Canadian Concrete Masonry Producers Association: "Concrete block is stronger and safer than wood. It is a more effective sound barrier. It retains its value, yet is easy to maintain – and is environmentally friendly."
- Energy-efficiency.
    - Reward Wall Systems (insulating concrete forms): "High Energy Efficiency. Increased Safety. Enhanced IAQ. Designing with Reward ICFs will give you the building you expect, the ease of construction desired in the field, and the building performance your clients demand."

- Reducing CO2 emissions; Life Cycle Analysis.

    - Holcim: “Create high-performance structures while reducing your environmental footprint. Envirocore – Build Greener with Holcim.”

    - Headwaters Resources (fly ash producer): “Turning gray concrete green... when added to concrete, fly ash makes concrete easier to work, stronger and more durable[and] enhances the environmental performance of concrete.” Also: “How to combat global warming, reduce the production of greenhouse gases, and build a stronger infrastructure: Specify fly ash.”

5.2.3 STEEL

According to a 2003 WPN report ‘Analysis of Business Risks and Proposed Market Strategy 2004-2006’, “the Steel Alliance spent more than $40 million on advertising aimed at undermining confidence in wood and promoting steel, and set its sights on achieving a 25 per cent market share in framing within five years. The five years have essentially passed and the steel industry still has less than two per cent of the market and has pulled the bulk of its advertising spend.” Today, in the absence of broad consumer-focused campaigns, the steel industry remains active in advertising targeting builders and architects. For example, the American Iron and Steel Institute as well as the Canadian Institute of Steel Construction are currently running ads promoting Steel Day, a coordinated single-day campaign in which steel companies and promoters will host educational events and open their offices, facilities or job sites to interested professionals and members of the public for demonstrations. (See Steel Day advertisement in Appendix D)

Sustainability is featured in a variety of the steel advertisements surveyed for this report, particularly where manufacturers promote steel in association with LEED, or promote continuing education opportunities through USGBC and AIA. Even though sustainability messaging is apparent in steel promotions, the industry continues to emphasize bold statements and assertions relating to the product’s durability and safety, with slogans such as “Welcome to the age of steel” and “Safe. Strong. Structures.” The following are examples of advertisements showing the types of messages typically used by the steel industry (copies of advertisements are included in Appendix D):

- ‘Green’ steel / sustainability.
    - Butler: “We’ve been Green as long as we’ve been Butler.... Butler makes sustainable building affordable.”
    - PAC-CLAD Metal Roofing: “Think Green.”

- Energy efficiency.
    - ATAS International Inc.: “Searching for green roofing? Save energy. Save money. Save the earth. ATAS is your single source for energy efficient building envelope technology.”

  - SteelBuilt / Technical Glass: “Welcome to the Steel Age. And the start of a beautiful new era.” [Promotes AIA course on incorporating glass for increased ‘daylighting’ – for sustainable design credits]

- Use of LEED trademark and/or USGBC or AIA logos.
  - Canadian Sheet Steel Building Institute: “We have the scoop on sheet steel sustainability, including LEED credits...”
  - Aegis Metal Framing (see below)

- Durability/ strength.
  - Aegis Metal Framing: “Safe. Strong. Structures.”

5.3 Earned media

An analysis of media coverage in the past year reveals evidence of the efforts on the part of the wood industry to advance, through earned media, its message regarding the green building applications and sustainability of its products. Sustained and coordinated media relations efforts by the concrete and steel industries in the areas of green building and sustainability are less evident.

For this report, a combination of subscription-based and internet research tools were used to identify and analyze earned media coverage generated by the wood, concrete and steel industries, primarily within mainstream and trade media in North America. Searches were conducted using association names from each industry, sector-specific keywords and green building topics.

Given the growing interest in green building, emerging regulations and the impacts on industries and consumers, the mainstream news media and trade media have been active in covering issues that relate to the use of wood, concrete and steel in construction. FH research has not uncovered evidence that recent media stories discussing the sustainability of construction materials were the result of coordinated industry outreach campaigns, with the exception of wood. Within trade media (for example, publications such as *Architectural Record, Canadian Architect, Buildings* or *Constructor*) articles which highlight wood, concrete or steel in the context of green building are typically project profiles in which architects and developers are quoted, or new product profiles focusing on innovation or advances in technology.

Where media coverage is directly attributable to wood, concrete and steel efforts, coverage typically stems from incremental efforts such as news releases or op-eds. Most of the major industry associations and manufacturers provide some form of online ‘media kit’ or newsroom on their websites, which include materials such as announcements, fact sheets, images and video. Some associations are going beyond simply making information available for media to retrieve, by helping member companies to engage with news outlets – for example, by providing matte stories and reusable media materials.

5.3.1 WOOD

Earned media coverage for wood has largely been in trade publications and primarily architectural publications. Wood Works, an initiative of the Wood Products Council, has been responsible for generating a large share of the earned media for wood. The organization has been active in the area of media relations for three years with public relations resources employed in three target regions of the US: California, North Central and the Southeast. The focus of Wood Works media relations has been trade publications: architectural and engineering publications primarily. The effort has generated three feature articles in *Structures* magazine to date. The typical Wood Works format is to place by-lined articles. The organization has achieved over 100 earned media hits, reaching approximately 2.9 million people. Of particular note was the recent *Architectural Record* feature focused on the 2010 Olympics, which was a follow up to an article written in *GreenSource* as a result of an FII-sponsored tour of Olympic venues for key architectural media writers.

Wood-related stories in the last year have covered three general themes: wood in the non-residential sector; greater consideration and valuation of wood in LEED standards; and practical directions on the use of wood in certain applications, mostly non-residential. Where wood featured in a building or development has received an award or recognition, effort (with some success) has been made to generate media attention for the award. Outside of trade and professional publications, very little earned media for wood is generated.

The American Wood Council routinely issues press releases, mostly focused on regulatory issues and green building. Sustainability-oriented releases include "Support from Members of Congress for Expanding Sustainable Forest Certification Could Stimulate Market for Forest Products" (July 2010) and "AWC Recognizes High-Performance Building Week – Wood Products are an Essential Element for Green Building" (June 2010).

The Canadian Wood Council's Wood Design & Building Magazine, published quarterly, offers a dedicated promotional vehicle for the forest products industry, and focuses on content which is appealing to building professionals such as architects. This differentiates the magazine from similar publications such as the concrete industry's *Precast Inc.* magazine (see below) which does not focus exclusively on buildings and may have a higher proportion of readers from within the concrete/cement industry.

A further example of media outreach from the wood sector includes a September 2009 *Minneapolis Star Tribune* op-ed by Dovetail Partners, a non-profit environmental consulting firm that works with the forest product industry, called "Green can be an illusion in construction." Excerpt:

> *For example, LCA comparison of several common wall-framing materials -- only one of which contains recycled content -- shows the material containing recycled content to have by far the greatest negative environmental impact in terms of energy consumption, water use and total emissions, including greenhouse gas emissions, from cradle to grave. And yet, green programs routinely encourage the high-environmental-impact option solely based on the attribute of recycled content.*

5.3.2 CONCRETE

Media coverage generated by concrete industry associations is also mostly in business and trade outlets, and stories are often based on topics such as awards and scholarships – rather than construction trends. While a search of mainstream media did not uncover many examples of concrete-related green building stories, media coverage of the industry has primarily addressed product innovations and CO2 emission reductions. For example, *Bloomberg Business Week* recently published an article related to an announcement by a cement company: Novacem - Cement That Eats Carbon. "The construction materials industry emits gobs of carbon dioxide, but a British startup has devised a new cement that absorbs and stores CO2 when it's produced."

The National Concrete Masonry Association provides support to member companies to conduct their own marketing by providing a range of collateral, including pre-written 'matte stories' for print media. Member companies are encouraged to distribute the articles to local papers and radio stations, and use the materials in newsletters. Sample matte stories include "Say Sayonara to Stick Built" and "Busy Buildings Staying Strong, Thanks to Concrete."

The National Precast Cement Association publishes a bi-monthly magazine called *Precast Inc.*, which "features articles about the latest industry technologies and developments, perspectives on current industry events, profiles on leading precast concrete companies and case studies of various manufactured concrete applications." While this publication has the appearance and trappings of genuine media, it cannot be compared to the value generated from stories carried in independent publications. The magazine, nonetheless, guarantees the industry regular profile, control of its message, and regular distribution.

An example of successful building material promotion is a July 2009 *National Post* blog from a civil engineer touting the benefits of "green concrete". Although generated by an individual, the posting conveys sustainability benefits of an entire sector. The author has obviously been educated in the benefits of green concrete and is applying his knowledge and promoting himself as an "expert". Although it is not possible to determine whether the concrete industry was directly involved in securing this op ed, the article itself demonstrates that building material suppliers can benefit from having third party experts "in their corner" and willing to put themselves into the media to comment on the products. Excerpt:

> *Today, fly ash and silica fume together with slag, which also has hydraulic properties, are the main waste materials used to replace cement in concrete. Doing so reduces the amount of CO2 produced per cubic yard of concrete. The other major benefit is that these materials also improve most of the durability characteristics of concrete.*

Concrete industry representatives referenced in news stories about the construction industry appear well-coached and are in a position to speak on behalf of their entire sector. For instance, a Portland Cement Association economist quoted in a January 2010 article about the strength of the residential construction market was able to promote the use of concrete for both residential and commercial projects. Excerpt:

Any optimism on home building should be tempered on a number of counts, said Ed Sullivan, chief economist for the Portland Cement Association, whose members provide concrete used in residential and commercial projects.

The association has its own economist who is being promoted effectively to media as an expert commentator. This tactic appears to allow the association to build relationships with media, generate coverage and build credibility for the industry in the context of broader topics around residential and non-residential construction.

News releases continue to be a primary tactic for the concrete industry's media outreach. Examples include an American Concrete Institute announcement about a low-environmental-footprint conference, and Holcim Canada's promotion of pervious concrete and the ability of concrete to qualify for LEED credits. It is difficult to determine whether these releases have resulted in news stories. Having said that, once produced and distributed, they become part of the permanent record and "searchable documents" that are available to stakeholders and others on their respective organizations' websites.

5.3.3 STEEL

The Steel.org website has a variety of media resources about the steel industry – news releases, op eds, and media contacts. Materials span a range of topics related to steel, and do not generally focus on sustainability. Effort is made to promote to the media speeches by various steel industry executives and to position steel spokespeople at trade events where media is present.

The association has also produced b-roll about the steel industry for media (see below). This tactic is different from tactics employed by wood and concrete sectors which have largely targeted print. By generating visual content, the association makes readily available content that can be repurposed for TV and digital mediums and recognizes the trend in online communications whereby audiences are increasingly consuming video.

AISI RELEASES B-ROLL DEPICTING MODERN, HIGH-TECH STEEL INDUSTRY

Valued Tool for Members and Media Covering the Steel Industry
This video tool depicts the new, high-tech steel industry. With the industry's transformation over recent years, AISI members and media alike will find the reel, entitled "North American Steel Industry B-Roll," of value to accurately portray the steel industry. The reel features selections of steelmaking processes and steel applications that display the industry's imagery as clean, technologically-advanced, innovative and environmentally-friendly. All clips are taken from various AISI member producer companies in North America. To obtain a copy of the B-Roll in DVD, VHS or beta format, please contact...

AISI routinely issues press releases (online at Steel.org) which seek to promote steel in the context of environmental performance and green building, as well as topical issues such as catastrophic weather events. For example:

Homeowners, Environmentalists, All Hail the Metal Roof
08/19/2008 - Belfair, WA – Hailstorms can result in widespread damage to homes. In a major hailstorm, the roof literally takes a beating. Hail can break, split and cause tear-off damage to traditional roofing materials, resulting in big repair or replacement costs. Homeowners looking for eco-friendly solutions have discovered that metal roofs can protect homes from many extreme weather events while reducing their carbon footprint.

Hurricane Season Here Again: Update on Rebuilding Efforts in U.S. Gulf Coast
06/18/2009 - Washington, D.C. – With the 2009 Atlantic hurricane season, which runs from June to November, upon us again, any one among 35 million Americans who live in regions most threatened by Atlantic hurricanes (or those who love them), is sharply attuned to being prepared for the worst. The North American steel industry, through both collective and individual company efforts, made a commitment to help rebuild the Gulf Coast region in the aftermath of Hurricanes Katrina and Rita "better and stronger" – and three and a half years later, positive results are being reported at a number of different levels.

Steel industry maintains leadership as energy efficient sector
12/11/2009 - Washington, D.C. –The United States steel industry has reduced its energy intensity per ton of steel shipped by approximately 31 percent comparing 2008 to 1990, the American Iron and Steel Institute reported today. This figure has fallen slightly from 33 percent in 2007, due to a large drop off in production starting in the fourth quarter of 2008, when the U.S. economy went into a free fall. "With processes as tightly controlled as those in steel mills, productions disruptions and repeated startup and shutdowns significantly impact energy performance" said Thomas J. Gibson, AISI president and CEO.

In 2008, AISI launched the "Sustainable Steel" website but it has since been taken down and is no longer active: "The Steel Recycling Institute has launched a new Web site, sustainable-steel.org, that provides a central clearinghouse for consumers and federal, state and local policymakers on the sustainable benefits of steel."

5.4 Trade shows and conferences

Research for this report focused on the three largest, and arguably most influential, events in North America which draw attendance from architects, engineers and other building professionals:

- American Institute of Architects annual convention and design exposition (AIA);
- Greenbuild, the annual conference and tradeshow hosted by the U.S. Green Building Council; and,
- International Builders' Show hosted by the National Association of Home Builders.

The analysis provided below is primarily informed by online research as well as interviews and a survey conducted with various professionals in the forest product industry. Representatives of each of the tradeshows either declined to provide detailed information about the nature of building material suppliers' involvement in their events, or did not respond to requests for information.

Wood, concrete and steel organizations (associations and manufacturers) continue to have a presence at each of the three major tradeshows, including exhibits and other involvement such as sponsorship and speaking opportunities. Organizations have used the events not only to market to and engage with building professionals, but also as a platform to make media announcements.

An informal survey of participants in the BC Wood Product Showcase exhibit indicated that each of the three sectors (wood, concrete and steel) place a significant emphasis on sustainability and green building in their tradeshow exhibits. Views were mixed on whether one sector has been more successful in conveying green messaging, however a number of individuals commented that wood is successfully portrayed as a natural material with a credible sustainability story, whereas similar efforts by concrete and steel often have the appearance of 'greenwashing.'

Two forest product professionals interviewed for this report commented that major building industry tradeshows in the past five years have featured a growing number of exhibits and conference content on the subject of green building and environmental performance. However, exhibits which tend to receive the most attention on the tradeshow floor are those which offer the most innovative and unique displays or giveaways – regardless of their 'green' content. In this respect, organizations promoting new technologies or applications may 'outshine' some of the more traditional displays offered by the wood, concrete and steel sectors. According to a U.S.-based forest product consultant, "architects, by and large, are not opposed to wood but they want to know what's new and exciting about it. They want to know 'what makes it easy for me to tell my customer to avoid the big steel-and-glass modern approach and use wood instead.'"

It should be noted that in addition to participation in the three major tradeshows, building material suppliers are also engaging in smaller or regional conferences and events, and some host their own events in which building professionals are invited to participate; for example 'Steel Day' (see below).

An Atlanta-based wood sales representative commented that the concrete and steel industry have increasingly placed salespeople at events targeting the commercial (non-residential) sector. "They attend a variety of conferences as well as events related to commercial building. I rarely see salespeople for wood manufacturers involved in local events hosted by AIA, CSI or the Structural Engineers Association."

5.4.1 WOOD

The North American forest product industry is actively marketing at the major building tradeshows, typically in the form of shared industry exhibits which promote the aesthetic

qualities and sustainable attributes of wood. In addition to timber producers and value-add manufacturers, forest certification organizations such as FSC, SFI and CSA host exhibits aimed at educating building professionals about sustainable forest management.

A survey of participants in the BC Wood Products Showcase revealed that one of the most successful aspects of the exhibit is the presence of expert and knowledgeable booth staff. One participant commented that it is critical for exhibitors to be able to engage conference delegates in technical discussions; in this respect, the coordinated displays mounted by the wood industry appear to be effective. Views about wood's messaging at the major tradeshows were mixed. Whereas one survey participant commented that wood tells a more authentic sustainability story compared to steel or concrete, another participant was critical of the wood industry's sometimes disjointed messaging, and the tendency to focus on promoting the geographic origin of products - "waving the Canadian flag to Americans" – as opposed to focusing on the natural benefits of wood. Two survey respondents commented that the wood industry's sustainability messaging at major tradeshows is often multi-faceted or too complex; for example, promotion of renewability, energy efficiency and forest certification. Respondents felt this may put wood at a disadvantage when compared to concrete and steel exhibits which use simple messages (e.g. "Steel – The New Green") or focus on a single theme (e.g. recycled content).

The forest product industry appears to be having some success in placing 'wood-friendly' content on the conference agenda at some of the major building industry events. For example, the recent Canada Green Building Council annual conference in June 2010 featured a panel entitled "The role of forests, wood and green design in mitigating climate change."

5.4.2 CONCRETE

A review of the exhibitor list for the upcoming AIA 2011 national convention shows that major cement manufacturers may have a stronger presence on the tradeshow floor compared to concrete industry associations. For the 2011 event, both Holcim and Lafarge will be exhibiting independently.

Similar to wood, the concrete sector has been represented in conference sessions at the Canada Green Building Council annual conference. The June 2010 event featured a case study entitled "Energy Efficient Design with Concrete Buildings" presented by the Director of Engineering for the Cement Association of Canada.

The Portland Cement Association used a press conference to increase its profile at the 2009 Greenbuild conference. In partnership with the charity Habitat for Humanity, PCA presented media and delegates with details on an initiative to build a LEED Platinum-certified concrete home in Arizona:

> **Home earns highest 'green' certification due to concrete applications**
>
> PHOENIX, Nov. 12 /PRNewswire-USNewswire/ -- The Portland Cement Association, in partnership with Salt River Materials Group and Habitat for Humanity, today held a press conference at the 2009 Greenbuild International Conference and Expo to educate attendees about Habitat for Humanity's first concrete home in Central Arizona. Selected

from more than 200 entries, the home will appear on the U.S. Green Building Council's "Contemporary Desert Living" tour, which showcases sustainable homes that embrace the region's culture. The home receives the coveted "Net-Zero" energy designation -- it consumes the same amount of energy that it produces on a yearly average -- is LEED(R) Platinum certified and exceeds Energy Star(R) certification requirements. Constructed with concrete walls and outfitted with concrete finishes inside and out, it showcases the versatile and sustainable applications of the world's most widely-used building material.

Recently, the National Ready Mixed Concrete Association has introduced the International Concrete Sustainability Conference – 2010 events are happening in Boston and Dubai. The conference "provides learning and networking opportunities on the latest advances, technical knowledge, continuing research, tools and solutions for sustainable concrete manufacturing and construction." Conference delegates include researchers, academics, students, engineers, architects, contractors, concrete producers, public works officials, material suppliers and concrete industry professionals.

5.4.3 STEEL

The steel industry has invested significantly in events which help to position steel as a green building material. In terms of the major tradeshows surveyed for this report, most notably the steel industry has stepped up its presence at the Greenbuild event by becoming a major sponsor. This has afforded additional promotional benefits and visibility at the event, and therefore steel is perceived to have a larger presence compared to wood or concrete. The move to become a sponsor of Greenbuild is consistent with the steel industry's broader strategy to become more engaged with the U.S. Green Building Council. Rick Fedrizzi, President of the USGBC, was invited to be the keynote speaker at the May 2010 NASCC Steel Conference. In his presentation he told delegates that "steel's role is critical in the green building movement and you've got an important seat at the table."

The steel industry is also engaging the structural engineering community through events. The American Institute of Steel Construction (AISC) is a major sponsor of *Structural Engineers Magazine*'s annual event, Buildings Conference and Expo. The AISC will present a workshop during the conference. Steel associations also engage building professionals in various industry events and conferences such as the MetalCon annual conference, "the single resource for anything you've ever wanted to know about using metal in construction. It's a tradeshow that educates professionals on how to integrate metal into traditional and sustainable construction."

Steel Day is a "worldwide event that encourages architects, engineers, contractors and specifiers to learn about steel design and construction by visiting steel facilities for free educational programs and networking activities." The event, which takes place at numerous venues in the United States (www.steelday.org) and Canada (www.steelday.ca) on September 24, 2010, was recently promoted in a full page advertisement in *Constructor* magazine. No sustainability or green building messaging is apparent in the promotion of the event.

The steel industry has also used conferences to showcase how the industry is addressing environmental issues; for example, the Green Steel Summit in Washington DC in May 2010. Hosted by Steel Business Briefing Ltd., a steel industry news and information service, the event

addressed strategies for steel producers, suppliers and consumers to deal with changing regulations related to carbon dioxide emissions and other legislative issues.

5.5 Digital

The internet is a key marketing medium for the wood, concrete and steel industries. Research conducted for this report reveals significant content, promotions and interactions related to green building exist in the online space. Building material associations and manufacturers continue to provide marketing and educational content targeted to the building trades online, and increasingly, social media platforms are being used by manufacturers and product associations to engage with key audiences. Much of the social media space dedicated to green building relates to residential construction; there are fewer examples of social media engagement related to non-residential development, with the exception of online content promoting award-winning projects.

Sustainability-focused online marketing is evident in the following areas:

- Association and manufacturer websites generally include 'green' messaging, and contain downloadable materials and resources related to green building, for architects, builders and developers.
- Online advertising includes Google ads and display ads, such as 'banner' ads. Some organizations have taken advantage of search engine optimization (SEO) to improve Google search rankings around sustainability-related terms such as 'green building' and LEED.
- Social media platforms have emerged that explicitly promote the sustainability attributes of building materials and products, however there is limited evidence of significant interaction between suppliers and architects or engineers online. Social media interaction in the building trades is occurring most often on platforms created by design and construction associations, on popular blogs and on the websites of trade publications.

Construction and design-related websites and interactive forums have the potential to become fertile ground for building material suppliers to convey key messages and engage with target audiences. For example, *GreenSource* magazine has an active online forum where building material suppliers engage in and respond to online discussions. The exchange below illustrates a typical interaction, and demonstrates the potential benefits of monitoring for criticisms, responding where appropriate, and identifying opportunities to proactively contribute to discussions with key messages and technical information. In the excerpts below, an individual working for a wood supplier took the initiative to respond to a steel industry representative in order to promote the overall benefits of wood:

> Forum comment by American Steel Industries / Metal Buildings Manufacturers Inc. representative:

> *Wood is not as recyclable as steel. Metal buildings can be disassembled and reassembled. Steel roof paneling reflect the heat sun rays away, reducing 80 percent of the building's heat. With a steel roof a consumer has the option to add solar panels. There is no roof more energy efficient than a steel roof. Metal buildings are stronger, longer lasting and greener than wood. No animals or trees are killed in the making of a steel building.*
>
> Reply from wood company representative (Lee Lumber, Chicago):
> *I'd like to start by saying that forest and trees are renewable natural resources when harvested properly. Wood too, is recyclable, and is even biodegradable and durable - sometimes lasting for centuries. While trees are renewable, each ton or iron ore, coal, and limestone is forever gone. According to Building in Wood to Meet Environmental Objectives wood is a more environmentally sensitive building material than steel. When comparing the (2) types of buildings from the raw material to the construction site - steel building materials consume 3x as much energy as wood and 16x as much as clean water - steel also produces 3-1/2x as much carbon dioxide (a gas that contributes to the greenhouse effect) as does wood.*

Further evidence that social media platforms have the potential to become active arenas for discussions about product benefits – particularly within the context of sustainability – is this 'wall' posting by a following of the American Concrete Institute's Facebook page:

> *Green Concrete as the name suggests is eco friendly and saves the environment by using waste products generated by industries in various forms like rice husk ash, micro silica, etc. to make resource-saving concrete structures. Use of green concrete helps in saving energy, emissions, waste water. Green concrete is very often also cheap to produce as it uses waste products directly as a partial substitute for cement, thus saving energy consumption in production of per unit of cement. Over and above all green concrete has greater strength and durability than the normal concrete.*

Architects and students appear to be the most engaged in social media channels where green building is discussed – ahead of engineers, developers and construction professionals. Increasingly, architects are tapping into forums to connect with peers and promote their work. An example of such a forum is Architizer, a beta site described as 'the largest crowd-sourced database of architecture online'. Architizer profiles more than 10,000 finished and proposed projects, and allows developers to search for architects. Whereas architects have traditionally marketed themselves through more traditional vehicles like print magazines, this website brings architects and developers together online in an interactive setting.

There is little evidence of architects and engineers using social media sites to research building materials and make specification decisions, however they continue to rely on manufacturer websites to obtain information to aid in decision-making and sourcing. An American Institute of Architects 2009 member survey asked architects how they research new products. Whereas publications and websites ranked first and second, respectively, it is interesting to note that 'word of mouth' is third on the list. This suggests that over time as online forums gain credibility as resources for architects to obtain referrals and 'word of mouth' recommendations about

products, these social media channels may become increasingly important for building material suppliers.

Excerpt from AIA 2009 survey:

Q. How do you find out about new products? Top 10 in order of most selected (multiple answers were permitted):

1. *architectural publications*
2. *manufacturer websites*
3. *word of mouth*
4. *sales rep*
5. *manufacturer continuing education (CE) seminars*
6. *catalogue and binders*
7. *manufacturer CE articles published in magazines/online*
8. *trade shows*
9. *third party websites*
10. *direct mail*

An April 2010 article in *Architectural Record* points out that social media sites don't typically generate business leads for architects. However, design firms are successfully using web 2.0 platforms to generate interest in their projects – primarily from journalists and fellow architects – and the article stresses that social media may play an increasingly vital role in winning new business. The writer points out that "social media is so new to the profession that it may take a few years before the benefits can be measured, but some firms are investing now with high hopes for future rewards."

As illustrated by the charts below, representatives of the wood, concrete and steel industries are marketing products via social media platforms – in particular Twitter, Facebook and YouTube. However, only a few associations in each sector have made a significant foray into the social media space. In sections 5.5.1 through 5.5.3 below, the most active organizations in social media, for each sector, are described followed by summary charts detailing industry association activities.

5.5.1 WOOD

The Society of American Foresters (SAF) is active on Facebook and Twitter, and engages not only with industry professionals but also any individual with an interest in forestry – as is evident through a Facebook wall conversation with student considering Forestry as a career. The SAF also uses social media to connect to related industries such as land management or pulp & paper; educational groups such as graduates and SAF affiliates at schools; media such as Forestry Source; and people interested in sustainability. However, there does not appear to be significant engagement with the construction industry.

Although lacking a Facebook presence, the International Union of Forest Research Organizations is active on Twitter. Followers include environmentalists, forest industry representatives and educational groups. Overall, they do not appear to have a strong connection with construction groups.

The American Wood Council's first tweet was in Spring 2010, and the account – which only shows only 10 tweets – has nonetheless generated a few construction industry followers. The account does not show two-way engagement.

The Wood Works campaign has enhanced its media relations efforts to include pitching stories to prominent bloggers. Similarly, the American Wood Council – through monitoring of online content – recently uncovered a blogger interested in fire resistance of building materials, and has proactively contacted the blogger with information about wood.

Organization	Facebook	Twitter	YouTube	Social Media (other)
American Forest and Paper Association	3 Likes		Y	
American Wood Council	7 Likes	12 Followers	Y	
Southern Forest Products Association			Y	
Society of American Foresters	1,472 Members	179 Followers	Y	LinkedIn
Engineered Wood Association	408 Likes		Y	
Canadian Institute of Forestry	207 Members		Y	MySpace
Canada Wood Council			Y	
Coast Forest Products Association			Y	Blog
International Union of Forest Research Organizations	Presence, but no likes	311 Followers	Y	

5.5.2 CONCRETE

With certain associations leading the way, the concrete industry is making a clear push into social media. For instance, Facebook and LinkedIn logos are prominent on the American Concrete Institute (ACI) home page. However, both Twitter and YouTube are absent from the institute's social media platforms. The institute is engaged on Facebook with fellow concrete industry professionals, builders, educational organizations and students, and conversation topics include sustainability as well as concrete uses, product developments and research. The ACI has nearly 7,000 Facebook friends – making this particular digital platform a powerful tool for reaching building trade professionals and the public alike. The association is also active on LinkedIn, with approximately 3,800 members.

Primarily engaged with members of the concrete industry, the National Precast Concrete Association (NPCA) is relatively new to the 'web 2.0' space. For instance, the association has fewer than 100 Facebook friends. The NPCA uses a range of social media platforms to announce new projects that use precast concrete. The association's Facebook page has a strong emphasis on sustainability, and includes advice for companies transitioning to social media marketing.

The Portland Cement Association engages online with builders, architects, green building organizations, environmental groups and educational groups, and provides advice related to concrete construction.

The concrete industry's attempt to position itself as green (or to be seen as making green improvements) has captured the attention of the blogosphere. However, a 2006 Treehugger blog post questioning why the Cement Association of Canada was sponsoring the Green Building Festival in Toronto shows that online influencers can push back against perceived 'greenwashing'.

Name	Facebook	Twitter	YouTube	Social Media (other)
American Society of Concrete Contractors	1 Member		Y	
American Concrete Institute	7181 Likes		Y	LinkedIn
Portland Cement Association	331 Likes	1,644 (ConcreteThinker)	Y	
American Coal Ash Association	33 Likes		Y	"Share" button on homepage
National Ready Mixed Concrete Association	175 Likes		Y	LinkedIn Picasa Web Album
National Concrete Masonry Association	2 Likes		Y	
National Precast Concrete Association	96 Likes	242 Followers	Y	LinkedIn Flickr
American Concrete Pavement Association	11 Likes			
National Stone, Sand, & Gravel Association	Page with 17 Likes; Group with 42 Members		Y	
Concrete Sawing & Drilling Association	244 Likes		Y	
Concrete Network	12 Likes	498 Followers	Y	"Share" button on homepage

5.5.3 STEEL

The steel industry is engaging in social media, as is evident by a presence on Twitter, Facebook and YouTube. In terms of 'green' messaging online, steel is focused squarely on recycling – both in terms of recycled content and the capacity for steel to be recycled after its use.

The Steel Recycling Institute (SRI) is one of the most active steel organizations in the web 2.0 space. For instance, SRI has a dedicated social media newsroom, which links to the organization's YouTube channel. However, there is little evidence of reader engagement on the site, which is used primarily as a hub for social media news releases. SRI's @EnviroMetal Twitter account has approximately 1,600 followers. Despite a significant following, @EnviroMetal has received few mentions, and a scan reveals little evidence of sustained dialogue with other Twitter users. EnviroMetal's Facebook page, which contains a video about recycled steel framing for use in residential construction, is at an early stage of development and shows approximately 130 fans. A lack of wall post comments leaves the impression of a one-sided conversation.

SRI's parent organization, the American Iron and Steel Institute (AISI), also has a social media presence. Although not focused solely on sustainability issues, AISI's blog includes a posting that criticizes new EPA regulations to limit greenhouse gas emissions in steel production. AISI's YouTube channel has fewer than 30 subscribers, however its Twitter account is better connected, with close to 400 followers. AISI's Facebook page, which does not focus on sustainability, has 380 fans.

According to its description, the American Institute of Steel Construction's (AISC) blog 'WhySteel.org' offers "unrivalled access to educational articles, newsletters [and] discussion forums" and provides "tips and ideas on convincing those in the design and development community that there's always a solution in steel." However, the blog appears inactive – given the most recent blog entries and news updates are dated 2009. By contrast, the AISC's Facebook page is quite active, having attracted more than 1,600 fans. The page is focused on education, and students consistently respond to wall updates. AISC's Twitter account, @AISCEducation, has approximately 900 followers, and is also used primarily as a resource for students and educators – plus an avenue for promoting the organization's student design contest. Although some educators follow the account, retweets and followers are mostly from other steel industry organizations.

Name	Facebook	Twitter	YouTube	Social Media (other)
Steel Recycling Institute (part of AISI – below)		1,601 followers	Y	Social Media Newsroom
American Iron and Steel Institute (AISI)	384 Likes	376 Followers	Y	"Share" button on homepage
American Institute of Steel Construction	1633 Likes	896 Followers (AISC Education)	Y	
Association for Iron & Steel Technology	57 Likes	56 Followers (AISTech)		LinkedIn

Metal Construction Association			Y	
Metal Building Manufacturers Association	5 Likes			
Steel Framing Alliance	27 Members		Y	
Cold-Formed Steel Engineers Institute	21 Members			
United States Steel	17 Likes		Y	
Steel Manufacturers Association				
Metal Roofing Alliance	5 Likes	262 Followers (InvGradeRoofing)	Y	
Cool Metal Roofing Coalition				

5.6 Education

"[AIA] continuing education courses are part of a growing national awareness about the importance of sustainable building. Indeed, there is a kind of informal continuing education going on across the architecture field, outside the boundaries of the professional requirements."
Fredric M. Bell, Executive Director, New York chapter of the American Institute of Architects
New York Times, August 20, 2009

For North American building professionals such as architects and engineers, possessing a working knowledge of green building is not only desirable, it is becoming necessary. Post-secondary institutions, continuing studies providers and industry associations offer a wide range of courses, certifications and degrees that recognize the growing need for building professionals to continuously upgrade their understanding of sustainable building practices. In 2009, the *New York Times* published an article chronicling the American Institute of Architects' recent implementation of a policy requiring all members to take four hours of continuing education courses in sustainable design every year. ('Return to class as green design advances')

Building material suppliers are becoming increasingly engaged in the delivery of education, particularly continuing education and training for building professionals. Often, continuing education courses are promoted in the context of providing information and guidance for building professionals on how the use of a particular building material can assist in obtaining points toward LEED credits, or other green building certification or standards.

For the purposes of this report, analysis has focused on the following channels being used by associations and manufacturers of wood, concrete and steel in the area of educating building professionals:

- Continuing Education courses offered in partnership with organizations such as CBGI, USGBC and AIA for professionals working toward LEED certification;
- Workshops, seminars and 'lunch and learns' for building professionals actively seeking information about a particular product, including in the area of green building; and,
- Technical information and tutorials offered directly on corporate websites, including resource libraries, data sheets, how-to guides and LEED calculators.

The Canadian Green Building Institute (CGBI) and the U.S. Green Building Council (USGBC) are the most widely recognized providers of green building education, providing access to LEED certification and professional certificates administered by the Green Building Certification Institute (GBCI). Both the CGBI and the USGBC offer access to third party educational providers to help "round out" building professionals' green building training. All third party educators must pay an annual fee to either the GBCI or USGBC in order for the institutions to continue to approve their courses. Some courses are offered by post-secondary institutions (e.g. "LEED Construction Management" – University of California) with a fee charged to students, while others are offered by independent companies and trade associations (e.g. "Designing with Insulated Concrete Forms" – Amvic Inc.) for no charge.

The American Institute of Architects' recent course directory offers a glimpse into how building material and technology suppliers have successfully integrated themselves into the Continuing Education sphere. For example, Lehigh Cement offers "A Concrete Solution to Green Building" course, while the Wood Products Council presents "Using Wood to Achieve Solid Building Performance". Most recently, Forestry Innovation Investment has sponsored the continuing education article "Wood Rates: How Wood Products Stack Up in Green Building Systems" which appears in the September 2010 issue of *Architectural Record* magazine. While the AIA provides a variety of courses, a review of the 2005-2010 course offerings reveals that concrete producers and associations seem to present themselves most often in regards to sustainability-related courses. In offering sponsored educational programs, building material associations and manufacturers are expected to provide accurate, technical and unbiased information. Architects expect that they will not pay for sponsored courses or workshops, so there can be substantial costs for sponsors to host events.

McGraw-Hill is a U.S.-based company that publishes some of the building industry's most popular magazines. The company employs a team of researchers and offers a range of educational services, all of which cater to the building trades. In addition to offering sponsored educational articles in its publications and online, McGraw-Hill sells continuing education opportunities to trade associations and manufacturers in which McGraw-Hill will create and deliver materials in print or online, administer tests and grant credits to building professionals. According to McGraw-Hill advertising account executive Bill Madden, "continuing education units seem to be the best way to educate architects about the use and applications of a building material. We have been publishing these courses since 1997 and the tests taken just keep growing every year. This year we will top 75,000 test takers. "

From 2005-2010, wood and concrete courses ranked consistently in the Top 20 most popular continuing education courses offered by McGraw-Hill. Courses in the category of "wood" ranked 4th most popular, while "concrete/cement" ranked 13th. It is also interesting to note that in the Top 5 most popular courses of 2008, courses on wood ranked 3rd and 4th with steel and concrete noticeably absent. [See McGraw-Hill CEU rankings in Appendix D] As of January 2011, McGraw-Hill's Architectural Record magazine will cease to be the publication through which AIA offers its members Continuing Education materials for credits in green building design. When interviewed for this report, AIA representatives declined to say how the institute will administer continuing education materials after January 2011.

While continuing studies courses help to target the already-practicing building professional, colleges and universities are also providing building material suppliers and associations with an opportunity to influence up-and-coming building professionals. For example, the American Concrete Institute offers a scholarship for students in North America whose studies relate to concrete (typically in engineering and architecture studies) and the National Precast Concrete Association also offers a scholarship to any student enrolling in an academic field relating to building or construction. A senior official in the Canadian forest product sector, interviewed for this report, commented that "future engineers and architects are a target audience for the wood, concrete and steel industries. I'd give an A grade to concrete and steel, and C to wood – we're just not doing a good enough job addressing the need to target students in universities. They are coming out of university with a bias toward concrete and steel."

5.6.1 WOOD

Forest product industry leaders interviewed for this report say that initiatives by the wood industry to engage building professionals directly with educational initiatives, particularly in the area of green building, are proving successful. Most notably, experts cited Wood Works, a campaign to promote the use of wood through a variety of channels including awards, competitions, workshops, an annual "Wood Solutions Fair" and a number of 'Lunch and Learn' special presentations provided free of charge to building professionals. The program has been active in several regions across the United States.

The American Wood Council (AWC) provides unique pages on its website tailored to each user group of building professionals, including engineers, architects, building officials, educators, fire fighters and builders. Depending on the user group the AWC will mail out complimentary brochures, guides, construction manuals and teaching guides.

The Western Red Cedar Lumber Association (WRCLA) provides website visitors with detailed physical properties of Red Cedar and engineering guides that come with a conversion calculator and downloadable 'span calculator.' The WRCLA also offers a number of courses – the Architect Advisory Series – which architects can take for credits towards their AIA sustainable design hours.

In a similar vein, the Naturally Wood website offers Green Building Toolkit including a variety of electronic tools and guides to aid in building with wood including an FII presentation template "Building Green with Wood" that details information about wood and sustainable design. The presentation can be repurposed and branded by any organization wishing to use the

information for its own educational or promotional purposes. Links to wood-related scholarships and design awards are also featured. Additionally the Frequently Asked Questions section of the webpage is very thorough, covering regional building codes, fire safety and durability queries. The Canadian Wood Council website features a similar range of technical information including a link to WoodWorks software, US and Canadian engineering software for wood design.

5.6.2 CONCRETE

The concrete industry is active in a range of promotions aimed at connecting with building professionals and post-secondary students. The industry's educational materials tend towards a particular emphasis on product resilience and sustainability.

The Georgia Prestressed Concrete Institute (GPCI) provides educational tools and seminars typically held around the noon hour and offering a complimentary lunch. GPCI has also developed a classroom presentation and curriculum for use in post-secondary institutions with the option to tailor the presentation to fit the needs of the specific course.

The National Precast Cement Association (NPCA) offers a variety of scholarships to undergraduate students enrolled in a civil engineering and construction-related curriculum. The foundation is sponsored primarily by NPCA members and its philosophy is, "to introduce the features and benefits of precast concrete products and create a more educated specifying community." In the area of green building, the NCPA provides a LEED calculator on its website (http://www.precast.org/sustainability_leed_calc.php), allowing architects and builders to determine how many LEED points can be obtained by using precast concrete products that contain recycled material such as fly ash and rebar.

On its ConcreteThinker.com website, the Portland Cement Association offers a comprehensive Green Building Resources Library of information, resources and materials including guidelines to "green your concrete", disaster resistance case studies, recyclability and links to concrete experts and 'thinkers'.

The U.S. Green Concrete Council publishes *The Sustainable Concrete Guide – Strategies and Examples*. The guide is $75.00 and includes chapters on carbon footprint, thermal transmission (i.e. heating and cooling efficiency), stormwater management and 'resilience with climate change'.

Cement maker Lafarge offers an online interactive Product Guide for LEED Project Certification, which enables building professionals to enter the postal code of their project in order to obtain information about specifying Lafarge products based on LEED credit categories. Each product listing includes a description of the product and an explanation of how that product can help contribute to achieving points in a particular LEED credit category.

5.6.3 STEEL

Based on research conducted for this report, the steel industry appears to be less active compared to wood and concrete in pursuing continuing education opportunities, however the

industry does offer training to building professionals. Large associations including the Steel Framing Alliance and the American Institute of Steel Construction offer comprehensive courses on the sustainability of steel and also offer steel facility tours.

The Cold Formed Steel Institute (CFSI) holds educational seminars at a national level with regional representatives that coordinate unique workshops at the request of specific companies. CFSI seminars are provided at a nominal fee and have established themselves within the building community by attending events like the Structural Engineers of GA and providing, “a task group to help overcome potential hurdles with cold formed steel”.

The Steel Framing Alliance provides a range of user-friendly information online in the form of free reports and case studies in which the user can access detailed cost comparisons of construction projects using steel versus competing products such as wood.

6.0 Comparative analysis

The wood, concrete and steel industries are all active in promoting the attributes and sustainability of their products. All have adopted sustainability messaging into marketing initiatives and no industry is absent from the various marketing channels – earned media, advertising, trade shows, digital, education – surveyed for the purposes of this report. In this respect, there is little comparative difference among the industries and none have embarked (as steel did several years ago) on a dramatically new marketing campaign or positioning. Economic recession in North America and the associated impact on construction makes it difficult to accurately discern whether one industry’s marketing initiatives may be performing better against another, but from the perspective of the individuals interviewed for this report, all appear to be holding their own.

What differentiates each industry is the nature of their respective messaging, particularly in the area of sustainability. In the most general terms, wood is marketed as a natural, sustainable product that offers a degree of recyclability. Concrete is promoted as having a large measure of recyclable content and potential and the industry is actively touting its performance in reducing CO2 emissions in the production process. Steel emphasizes its high degree of recyclability and is also promoting steps the industry has taken to reduce energy and CO2 emissions in production. From a comparative standpoint, the only common sustainability claim among all three products is recyclability which steel aggressively promotes as its primary advantage.

Green building trends are growing in prominence and all building material industries are aggressively positioning to ‘win’ the battle for recognition of their respective products in the evaluation systems of the major green building standards such as LEED. The decisions being made by USGBC on LEED, other rating systems, standards and codes established by governments, will have considerable influence on the market for wood and other building materials. The policy makers and green building leaders who will ultimately influence these standards are among the most important audiences for wood, concrete and steel marketing efforts in addition to architects, engineers and builders. Concrete and steel are actively looking

to be 'at the table' for decisions on green building standards development as well as marketing their 'green' messaging to the broader building and development industry.

Because no set of common standards has yet emerged whereby the sustainability claims of wood may objectively outpace that of concrete and steel, it appears that all that steel and concrete require is to have some sort of green messaging. This may change as a standard life cycle assessment standard emerges, and also speaks to why materials producers appear to be equally focused on standards as they are on the marketplace. In the meantime, even though buyers and influencers are receptive to more sustainable building products, they appear not to want to delve too deeply into differences between the various claims of sustainability. This favours steel and concrete particularly when they advance simple and often bold sustainability messaging and then move to their traditionally strong message platforms of durability, longevity and product familiarity.

By comparison, wood messaging tends to be more complex. When the industry gets into comparisons with concrete and steel, the tendency is to defend based on somewhat more complicated measures that are difficult to portray effectively in marketing materials or to non-technical audiences. This is partly a result of the very different nature of the wood products industry compared to steel and concrete. For example, wood stewardship and production is covered by a variety of certification systems. While the promotion of wood products that fall under recognizable certification programs is a good sustainability message unto itself, certification is a complexity that steel and concrete do not need to deal with.

Wood continues to encounter the 'baggage' associated with previous ENGO campaigns. Negative perceptions about forestry linger and as a result the industry appears to often "defend" itself in its marketing and messaging by placing emphasis on forest certification. This messaging has some challenges. Partly it is defensive and complicated to explain. More so, the promotion of certification schemes when compared to steel and concrete feed the perception that forestry requires stringent oversight to mitigate environmental damage. There is also ample evidence of different certification programs (most notably FSC) criticizing other certification programs that they deem to be inferior, thereby contributing to doubts about the ability of the industry to manage forests in a sustainable fashion. The concrete and steel industries have no similar baggage to overcome, and are therefore in a better position to rely on simpler claims about their green credentials.

Concrete and steel are also benefiting from attitudes about sustainability and green building standards tied to the measurement of energy efficiency as a key indicator of a green building. Steel and concrete are messaging and marketing effectively on this score. Wood does not always elevate building energy efficiency as a priority in its messaging and when it does, messaging is often associated with how wood may be adapted in the building process to create energy efficiency. Concrete and steel market, albeit in more simplistic terms, "intrinsic values" such as their insulating and reflective qualities respectively.

In the area of marketing approach, efforts coming from wood appear to be more fragmented than those of concrete and steel. This does not mean the wood products industry is generating conflicting messaging, but is more a reflection of greater consolidation and uniformity in the

steel and concrete industries whereby marketing efforts seem to be coming from fewer and larger sources. This helps contribute to greater consistency and simplicity of messaging, and potentially benefits in terms of realizing economies of scale in marketing expenditures. (e.g., steel industry association sponsorship of the Greenbuild conference).

Research indicates that the marketing spend on display advertising is diminishing among concrete and steel sectors. All sectors, however – wood, concrete and steel – are placing increasing emphasis on marketing activities that enable direct engagement of key audiences (architects, engineers, builders). For example, the growing emphasis on hosting technical workshops and continuing education courses that allow building professionals to obtain credits toward green building certification. All sectors appear to be taking advantage of continuing education modules offered by major publications, in which sponsored articles both educate audiences on green building applications, and promote the sponsor's material or product. In general, education seems to be growing as a marketing channel for wood, concrete and steel, particularly given the increasing appetite from building professionals to gain skills and credentials related to green building.

Concrete and steel also appear to be pursuing "thought leadership" – engaging third parties, experts, researchers and educators to make the case for their industries' green credentials and other messaging. This appears to be less evident with wood. This also may be a reflection of the influence third parties have on the setting of standards.

Based on the findings of the competitive analysis, the following measures are recommended for consideration:

- Research on architects' preferences shows that while green building trends or requirements will influence architects' specification of different building materials, other factors such as aesthetics, familiarity and ease of use continue to be primary considerations, and will continue to be important factors in successfully marketing to this audience. All sustainability messaging therefore must support and fit within the full set of practical considerations that guide specification and ultimately influence a buying decision.

- Concrete and steel are actively positioning themselves on the LCA debate. Wood is well-positioned, but should not assume that it will 'win' this debate and will need to be solidifying its positioning on LCA and doing what it can to influence the development of LCA measurements that will be introduced into green building standards such as LEED. As mentioned above, the absence of fixed "goalposts" that define precisely how one product is more green or sustainable than another appears to suit the concrete and steel industries. Conversely, an objective means of comparison should benefit wood products.

- It is difficult to analyze the effectiveness of wood, concrete and steel industries' marketing efforts given the lack of an obvious objective resource whereby the three industries can be compared. Furthermore, efforts to compare the success of the forest product sector against competitors is particularly difficult when there is no centralized source from which to make comparisons. Given the significant changes going on in the building and development industries related to economic conditions, the LCA standard development process, and the

increasing demand and requirements for green building, FII and other forest product organizations would benefit from a more comprehensive and regular assessment of wood marketing and messaging in comparison to steel and concrete. While this report may provide insight and potentially a benchmark for the industry to track progress in marketing within North America, the creation of an ongoing market monitoring program is recommended. Such a program could potentially involve:

- Monitoring the messaging and positioning of steel and concrete (and potentially other sectors such as plastics/composites) on a regular basis.
- Monitoring media and social media for evidence of each sectors' messages on key topics such as green building, and for examples of advertising and direct engagement with audiences.
- Identifying building professionals in key geographic markets (or other sources of intelligence) who can provide insight on a regular basis regarding the efforts of competing sectors to influence architects, engineers and builders – both in terms of messaging and marketing tactics.
- Using the information gathered from monitoring to inform and enhance wood marketing efforts, and to inform ongoing research and surveys aimed at gauging the effectiveness of forest product industry marketing.
- Development of a standardized matrix in which steel, concrete and wood marketing positioning and messaging may be regularly compared.

7.0 Appendices

Appendix A

Organizations whose online materials were surveyed for this report:

American Institute of Architects
Alliance for Environmental Technology
American Coal Ash Association
American Concrete Institute
American Concrete Pavement Association
American Fiberboard Association
American Forest & Paper Association
American Institute of Steel Construction
American Institute of Timber Construction
American Iron and Steel Institute
American Shotcrete Association
American Society of Concrete Contractors
American Wood Council
American Wood Protection Association
Architectural Woodwork Institute
Association for Iron & Steel Technology
Canadian Concrete Masonry Producers Association
Canada Green Building Council
Canadian Wood Council
Cement Association of Canada
Center for Advanced Cement-Based Materials
Center for Environmental Innovation in Roofing
Cold-Formed Steel Engineers Institute
Concrete Foundations Association of North America
Concrete Homes Council
Concrete Network
Concrete Sawing & Drilling Association
Construction Owners Association of America
Cool Metal Roofing Coalition
Forest Products Society
Forest Resources Association
Forestry Innovation Investment
Hardwood Manufacturers Association
International Packaged Concrete Manufacturers Association
International Wood Products Association
Metal Building Manufacturers Association
Metal Construction Association
Metal Roofing Alliance

National Association of Home Builders
National Concrete Masonry Association
National Hardwood Lumber Association
National Lumber and Building Material Dealers Association
National Precast Concrete Association (NPCA)
National Ready Mixed Concrete Association
National Roofing Contractors Association
North American Wholesale Lumber Association
Portland Cement Association
Royal Architectural Institute of Canada
Steel Erectors Association of America
Steel Framing Alliance
Steel Manufacturers Association
Structural Building Components Association
The American Institute of Architects
The Engineered Wood Association
The Hardwood Council
U.S. Concrete Industry Associations
United States Steel
Western Red Cedar Lumber Association
Wood Component Manufacturers Association
Wood Works

Appendix B

Popular websites and social media channels for building professionals

A basic online audit conducted for this report uncovered examples of green building and architecture blogs and online forums that are popular with design and construction professionals. Many of the websites run digital advertisements for building material suppliers and associations:

- Construction.com (online forum) – The site's key discussion topics include 'green building projects' and a forum 'for young architects', and guest commentators include trade journalists and engineers. Recent sustainability-related discussion topics include 'Steel vs. Wood' in the Sustainable Products & Building Materials Category.
- Building Green – Targeted at architects, this site has an active user community and online forum and features sustainability-related postings, including a blog focused on product reviews. The site also offers the GreenSpec Product Guide, which lists over 2,200 environmentally preferable products selected by editors. Access to the site is by subscription. Building Green does not accept advertising.
- Inhabitat –With a tagline "Green design will save the world", the site is "devoted to the future of design, tracking the innovations in technology, practices and materials that are pushing architecture and home design towards a smarter and more sustainable future." In 2006, the blog featured a series called "Green Building 101" that is still being promoted on the site today. Inhabitat has over 40,000 fans on Facebook and was recognized as one the top 12 sustainability blogs by Time Magazine in May 2009. The founder of the blog hosts the annual Green Gadgets conference.
- Sustainable Cities Collective –Described as "an online community for urban sustainability professionals," this site is popular with architects and includes some features on green building.
- Jetson Green – a popular architecture blog focusing on green innovation primarily in the residential context. The site publishes case studies, product profiles, book reviews, news updates, and opinion articles.
- Archinect – Developed in 1997, Archinect's goal is to connect architects from around the world, and the site has become a popular online destination for design students, architects and educators. Although discussion topics generate a significant level of reader engagement, few of the discussions focus on sustainability.
- ArchDaily –Founded in March 2008, ArchDaily is touted as "the online source of continuous information for a growing community of thousands of architects searching for the latest architectural news…" The following tag cloud from the site's homepage shows that concrete, wood and steel are topics frequently used on this site in blog and forum posts (note: the formatting below reflects the appearance of the tag cloud on the

ArchDaily website – the larger the text, the more frequently the term is cited in the website content):

AD Project Insights Australia Austria Brazil Brick California Canada Chile China Concrete Denmark France Germany Glass Italy Japan Mexico New York Norway Ordos 100 Portugal Shanghai 2010 Slovenia Spain Steel Stone Sweden The Netherlands USA Wood

- The American Institute of Architects –The AIA website includes the Architect's Knowledge Resource, which is described as a "place to find solutions, share your expertise, and connect with colleagues".
- American Society of Civil Engineers - This site, which contains a section on sustainability, encourages members to be engineering advocates through such topics as an ASCE public relations training program, 'changing the way you talk about engineering', and connecting with local journalists.
- Buildipedia - This community site is run by a team of architecture, engineering and construction industry professionals and is aimed at presenting a wide variety of information resources, tools and discussion forums on various topics related to development, including green building. The site's Knowledgebase project has catalogued thousands of articles, photos and videos about various aspects of building.
- NAHBGreen – the home of the National Association of Home Builders Green Program online, this website offers builders, remodelers, developers, and other home building professionals a variety of services to learn, incorporate, and market green building. Visitors are encouraged to join the NAHBGreen group on LinkedIn, a social media channel geared to professionals.

Appendix C

ARCHITECTURAL RECORD
CONTINUING EDUCATION

Most Popular CEU Courses

TOP 5 COURSES OF 2009			
SPONSOR	**COURSE TITLE**	**NO. OF TESTS**	**CATEGORY**
James Hardie Building Products	Intrinsic Materials: Modernism, Sustainability and Fiber Cement Panels	2,420	Finishes
• Guardian Industries Corp. • MechoShade Systems, Inc. • Pella Windows & Doors • Technical Glass Products (TGP)	Daylight Savings: Window Systems Deliver Light and Reduced Energy Costs	2,179	Doors & Windows
Umicore Building Products USA Inc	Essential Zinc: Building For The Future	1,905	Thermal and Moisture Protection
GE Appliances	Smart Appliances for a Sustainable Smart Grid: Hot Water Hybrids Save Energy and Conserve Water	1,890	Residential Appliances
JELD-WEN® Windows and Doors	Renovating an Historic Structure for LEED Platinum Certification	1,815	Doors & Windows

TOP 5 COURSES OF 2008			
SPONSOR	**COURSE TITLE**	**NO. OF TESTS**	**CATEGORY**
GE Appliances	Hot Water on Demand: Natural Gas Tankless Hot Water Heaters Fit your Energy Budget	2,924	Residential Appliances
Dow Corning	Specifying Silicone Sealants: Providing Weather Sealing and Flexibility Between Building Components	1,894	Thermal and Moisture Protection
Hardwood Council	The American Hardwood Advantage: Carbon-neutral Materials for Today's Zero Tolerance Goals	1,878	Wood
JELD-WEN® Windows and Doors	The Case for Certified Wood	1,846	Doors & Windows: Wood
Big Ass Fans	Large, Low Velocity Fans: Making Energy Efficiency a Breeze	1,824	Mechanical: Fans

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