Certification of Building Materials: Important or Not?

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Introduction

A constant theme in green building programs of North America is certification of wood. There appears to be a near consensus that "green" credits should only be awarded when it can be demonstrated that any wood used in a structure has been responsibly produced.

The meaning of the term "responsibly produced" varies, but in the forest certification program most often specified in North American green building programs – the Forest Stewardship Council (FSC) certification program – critical elements of responsible production are identified as basic principles and are reflected in program requirements. Among these principles are compliance with laws; operation under a management plan that ensures appropriate protection of flora, fauna, water quality, soil productivity, historic areas, old trees, and more; maintenance of high conservation value forests; attention to indigenous people's rights and to tenure and use rights and responsibilities; attention to rights of workers and to the well-being of local communities; attention to who receives benefits from the forest, with the objective of ensuring that benefits are not siphoned off by large corporations or others to the detriment of local peoples and communities.

It is time for those involved in the green building movement to seriously consider whether the elements of responsible production are important or not. For example, is it really important that materials used in building construction in North America be sourced such that indigenous people's rights are protected? Such that workers are fairly paid and that child or slave labor are not used in procuring or processing raw materials? Such that local peoples and communities are not unfairly treated as local resources are extracted for use elsewhere? Such that forests, wildlife, waters, and other aspects of the environment are managed and protected with long-term sustainability in mind? *If so, then it is time to ask why such assurances of responsible production, and everything that responsible production has come to mean, are not expected for building materials in general.*

If steel used to frame a house is sourced from a mining operation that has obliterated millions of acres of tropical forests, including old-growth forests, over the past decade in accessing the iron ore, is it OK to use that steel in a "green" building? What if that ore was reduced in a blast furnace fueled by charcoal that came from the clearcutting of vast areas of tropical trees and by an industry characterized by the pervasive use of slave labor? Suppose that the cement used in an ICF wall originated in a mining operation known for excessive consumption of energy and ground water, and air and water pollution well beyond international norms. Can that cement be viewed as a green material? What if the aggregate used in making the concrete in that wall came from a river in which extraction of gravel is devastating salmon populations and increasing the incidence of flooding of river communities? Can that be considered a "green" material?

The answer to all of the questions posed above is that today it is a virtual certainty that high environmental impact, high social cost products are routinely finding their way into buildings certified as "green."

There are no requirements or incentives of any kind that a purveyor of steel, aluminum, concrete, plastic, glass, bamboo, or any material other than wood demonstrate environmental and social responsibility in management or resource extraction, despite the fact that substantial environmental and social impacts are associated with production of all of these materials.

It is now time to begin moving toward certification of all materials used in construction. The responsibility for initiating such change lies squarely with the leaders of green building programs, executives of the largest building materials distributors, environmental organizations, and environmentally concerned citizens.

Table 1
U.S. Net Import Percentages for Basic Materials Used in Construction

Material	Avg. % Net Imports, 1999-2008	Principal Suppliers	% of Imports from Developing Nations
Construction lumber	34	Canada (90%), EU, N. Zealand, Chile, Russia	<1
Bamboo	100	China, India, Vietnam	100
Cement	21	Canada (18%), China (16%), Thailand (11%), S. Korea (7%), Mexico (4%)	30+
Sand and gravel	Net exporter	Mexico (53%), Canada (41%)	59
Iron/Steel	15	Canada (17%), EU (16%), Mexico (11%), Brazil (8%)	20+
Iron ore	9	Canada (55%), Brazil (38%), Chile (2%), Trinidad/Tobago (1%)	41+
Aluminum	31	Canada (55%), Russia (17%), Brazil (4%), Venezuela (4%)	25+
Bauxite/alumina	100	Guinea (20%), Jamaica (19%), Australia (17%), Brazil (15%), Guyana (9%)	63+

Source: Data for wood from Howard and Westby, USDA-Forest Service, Forest Products Laboratory (2007) and from Random Lengths (2000-2008); metals and minerals data from U.S. Geological Survey (2009).

Sources of Construction Materials

When certification programs were developed for forests and wood, the original focus was imported tropical wood. Tropical wood was (and is) the product category most often linked to forest loss and environmental degradation, illegal activity, corruption, and social upheaval. Although forest certification programs are currently operating in all parts of the world, it is in the tropical and economically developing regions where the most significant problems remain. This is also where the greatest vigilance in raw material sourcing is needed.

A somewhat similar situation exists with respect to basic raw materials other than wood. For instance, the worst examples of environmental and social problems associated with mining can be found in the tropical countries and developing nations in general where environmental standards, laws, and law enforcement are often less rigorous than in more developed countries. In contrast, mining operations in the United States and Canada, though responsible for substantial impacts to the environment and nearby communities, are conducted for the most part in accordance with the highest standards globally for such operations. Thus, one indicator

of the environmental and social risk associated with the unmonitored use of any material is the extent to which that material is sourced from developing regions. As shown in Table 1 (previous page), the net import figures for all common construction materials are significant, meaning that the environmental and social downside risk of using such materials in green projects is significant as well.

As indicated in Table 1, the U.S. has long been a net importer of iron and steel and iron ore (with a large proportion of the imported ore (38%) obtained from the Carajas region of Brazil). The United States is also a net importer of three of the four metals used primarily in making alloys of steel: manganese (100% of domestic consumption), chromium (62%), and nickel (17%). Molybdenum is domestically produced, but with high environmental impact. The vast majority of imported metals used in alloy production originate in developing nations.

Similar patterns can be seen in net trade flows of other essential materials. In instances in which the U.S. is self-sufficient or a net exporter there is nonetheless international trade of these materials. In the case of sand and gravel, for example, the U.S. is a net exporter, but substantial volumes are shipped into California each year from the Fraser River area of British Columbia.

Somewhat ironically, the one material for which environmental certification is almost universally promoted – construction lumber, is the material for which the net import percentage from developing regions is lowest and which carries with it the lowest risk of environmental degradation, social upheaval, illegal sourcing, and corruption.[1]

CVRD Cuts Ore Supplies to 4 Suspect Pig Iron Firms

Rio De Janeiro, Oct. 25, 2007. Brazil's mining giant CVRD (VALES SA) started cutting off ore supplies to domestic pig iron producers accused of breaching the countries environmental and labor laws. . .

. . . The company's decision came after Brazil's environmental protection agency and the labor ministry stepped up inspections this year of pig iron producers.

Many companies were accused of buying coal produced with illegal wood or made at charcoal works that use slave labor. CVRD did not provide the volume of its sales to these companies. The company, which is one of the world's top miners, has recently launched a flashy marketing campaign in Brazil stressing its commitment to environmental preservation.

Amazon's regional industry watchdog, Citizens' Coal Institute (ICC), said in August that around 12 percent of charcoal works there still use slave labor despite a major crackdown since 2004.

Brazil's Carajas region in the Amazon is one of the world's major pig iron exporting centers, with exports of around 6 million tonnes per year. The Carajas region has a total of 1,500 charcoal works, according to the ICC.

Charcoal producers have come under international scrutiny by U.S. pig iron consumers who do not like the idea that the origin of imported materials for their own products can be unethical for either labor or environmental reasons.

Reuters: Reporting by Andrei Khalip, Editing by John Picinich

[1] Construction lumber throughout the world is overwhelmingly of softwood species that are obtained from either natural forests or plantations located in temperate regions of the world. The vast majority of volume comes from the United States, Canada, western and northern Europe, and plantations in several southern hemisphere countries. Relatively low impacts associated with manufacture, as compared to alternative materials, has been well documented in a number of published life cycle assessments.

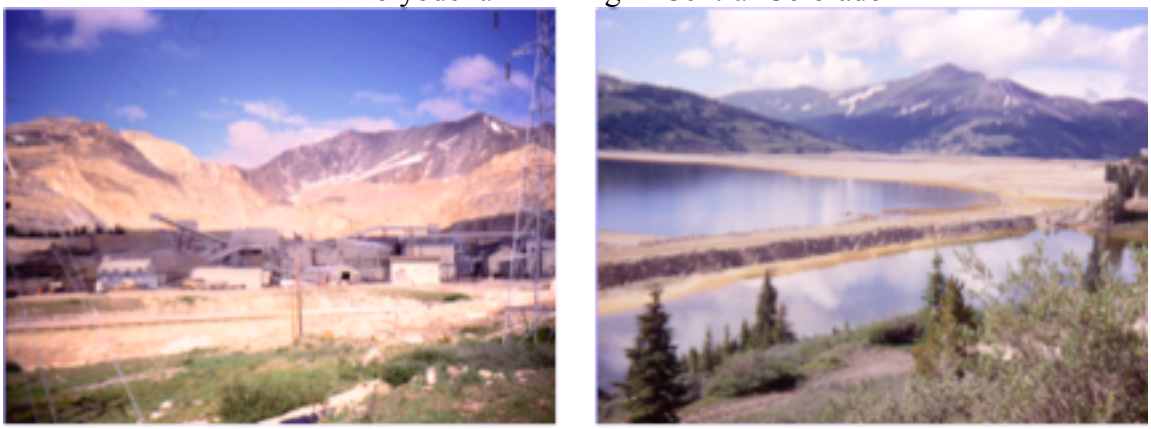
Environmental and Social Impacts of Raw Materials Extraction and Processing

Information regarding environmental and social impacts of U.S.-bound raw materials is not hard to find. Problems exist for every basic material and in virtually every supply region, although as noted earlier negative impacts tend to be most severe in economically developing regions.

A 2004 World Rainforest Movement report on social and environmental impacts of mining begins with the words "Mining is a problem, and as such should be treated." The 164 page report documents negative impacts to air, water, land, forests, wildlife, fish, plant and animal biodiversity in general, local communities, human health, and more in nine countries of Africa, seven of Asia, five of Central America, and eight of South America. A World Resources Institute report published in the same year lists 39 World Heritage Sites threatened by mining activity. Similar problems are detailed in recent reports from well respected national and international agencies and organizations, as well as in a large number of regional and company-specific reports, some of which are listed at the end of this article. Particularly interesting are a series of award winning articles that focused on gravel extraction in British Columbia and subsequent export to California, and environmental and socially devastating oil exploration and drilling in Ecuador – for production of oil for U.S. consumption (Knudson 2003).

Even where mining laws are observed and regulatory oversight provided, the impacts of mining are substantial. The production of steel, for example, involves not only mining and reduction of iron ore, but also other metals. Iron ore is by far the leading metallic ore extracted in mining; less known is that five of the next nine metals of the top ten are used primarily to make alloys of steel. As noted earlier, these include manganese, chromium, nickel, and molybdenum. Molybdenum gives steel improved hot and cold strength, added wear resistance, and higher tensile strength. Though domestically produced (the U.S. is a net exporter), the impacts of molybdenum extraction are quite high (Figure 1).

Figure 1
Molybdenum Mining in Central Colorado



At this site the ore is of low grade, meaning that less than 5 pounds of molybdenum metal is obtained from every ton of ore taken from the surrounding mountains. The result is the addition of about 1995 pounds of waste rock, in the form of fine sand, to the alpine tailing ponds for each 5 pounds of metal produced.

It is not that the mining industry is inherently evil or irresponsible. Metals and minerals are essential to mankind, and their extraction and processing is necessary. However, as is the case with virtually all basic raw materials, the enterprises involved range from very large to very small, operate over very large geographic areas, and involve hundreds of thousands to millions of players. While a great deal of activity is conducted in accordance with standards of best practice globally, a significant amount of activity is not. Because of this reality, there is no assurance of responsible production when using metals and minerals flowing through an unmonitored supply chain.

Certification Programs for Non-Wood Materials – the Foundation is in Place

In the early 1990s, as certification programs for wood were being developed, a number of players viewed wood certification as only the first of many such programs, with all basic materials to be eventually covered. Consequently, also in the early '90s, WWF-Australia developed a proposal for a Mining Certification Evaluation Project (MCEP).

Attention on the part of the environmental community to environmental and social performance of the minerals industry led to similar attention to such issues within the industry itself. Most notably, during the 1998 World Economic Forum in Switzerland, seven chief executive officers of the world's largest mining companies met to discuss sustainable minerals development. This meeting resulted in establishment of the Global Mining Initiative which led, in turn, to a World Business Council on Sustainable Development project: Mining, Minerals, and Sustainable Development (MMSD). The final report of this effort, released in 2002, discussed among a number of topics, the possibility of certification of mining operations. In that same year, at an OECD-sponsored international conference focused on foreign direct investment in mining and environmental impacts, it was announced that WWF was working with Placer Dome (a large mining company) to evaluate whether mining could be included under a similar certification model as the Forest Stewardship Council (OECD 2002, p. 163).

As the global mining industry studied and deliberated its role in sustainable development, WWF efforts to fund the MCEP continued, with the mining industry at the top of the funding request list. Finally, after a decade of effort to obtain financial support, work on the MCEP was begun in early 2003.

A little over three years after initiation of the MCEP, a final report of the evaluation of the potential for mining certification was published (2006). The MCEP effort was informed by developments relative to wood certification, and resulted in identification of fundamental governance issues and development of a draft set of principles and criteria regarding mining certification. Contentious issues were also identified, including references to indigenous people; issues related to free, prior, and informed consent; issues related to flexibility in adapting a global standard to diverse operating circumstances; auditing costs; and mechanisms for enabling the participation of small and medium-sized enterprises.

As part of MCEP, six field trials were conducted: four in Australia, one in New Zealand, and one in Brazil, with the purpose of testing proposed audit processes.

A central finding of the MCEP was that a mine certification program is feasible. The report concludes with the observation that:

> *"The task of creating a working certification scheme still lies ahead and progress will largely depend on the efforts of those who choose to champion the idea. A broadly-based coalition of stakeholders offers the best prospect for success. The essentially Australian-based nature of the project means that an international debate is a critical next step in any evolution of a certification scheme for mine sites. The MCEP has created a platform and arguably an imperative for that debate."*

An earlier commentary by a senior policy analyst, Industry Canada (Shinya 2002) noted that there is no guarantee that the adoption of a certification program will satisfy industry critics. He also questioned the usefulness of certification of metals in situations in which a number of different materials are brought together in a single product, such as an automobile (or a building), when the other materials are not subjected to certification. He concluded "Nevertheless, a well designed and administered certification program has the potential to harness market forces in a manner that promotes sustainable practices in the minerals industry."

So, an imperative for mining certification has been created, and a foundation for rapid development and implementation of a mining certification program that has the potential to promote sustainable practices is now in place. Needed now are champions, a coalition of stakeholders, further debate, and action.

The absence of activity to this point on the part of what would seem to be obvious champions and involved stakeholders in a mining and metals certification effort is a bit puzzling. Why, for example, is the North American green building movement not actively involved in mining certification efforts? Ditto big box building materials retailers? None of the North American green building programs requires certification of any material other than wood, nor is there any discussion or action along these lines within the leadership of any of these programs. At the same time, Home Depot, a firm that has widely touted the inclusion of certified wood in its product offerings as well as its efforts to encourage certified wood availability, has been completely silent regarding other materials despite widely known environmental and social problems linked to them. Influential organizations such as green building programs and large retailers need to step forward and embrace broader certification efforts beyond wood if real progress toward sustainability is to be achieved.

Certification of Non-Wood Materials: How to Move Forward

Certification of building materials is no longer an abstract concept. Certification of wood is well established, as are mechanisms such as source separation and chain of custody for ensuring the veracity of certified content.

At this point, formal efforts to certify mining operations span sixteen years, and it appears that progress has stalled. When the certification of wood reached this point, stakeholders within the United States and Europe stepped forward to provide incentives for progress.

The giant UK retailer B&Q began requiring in 1995 that its principal suppliers provide FSC certified lumber and wood products, creating overnight a powerful market incentive to potential suppliers. Home Depot followed suit four years later. Then, as green building programs began to take shape, the use of certified wood, and specifically FSC certified wood, became an almost universal component within them. It is undoubtedly the case that certified wood would not have the prominence in U.S. and European markets that it does today absent such actions; it is even possible that attempts to create a certified wood market and industry would have failed by now without them.

It is now time to move rapidly toward certification of industrial materials in general. Just as was done to push development of certified wood products, B&Q, Home Depot, Lowes, and other firms that promote themselves as environmental leaders now need to unambiguously state an intent to carry only third-party certified construction materials and to establish timetables for the supply of certified metal products, cement, plastic and other products to their distribution centers. Similarly, green building programs need to aggressively modify their standards to require or promote the use of certified construction materials.

The Bottom Line

There is no question that there are significant environmental and social problems linked to extraction and processing of every basic material used in building construction. It is also a reality that problems tend to be greatest for those materials that are extracted and processed in regions in which regulatory oversight is less developed. Moreover, because of a total lack of oversight as to where materials other than wood originate or how they are produced, there is little doubt that some of the materials finding their way each day into "green" buildings are anything but green.

Attention to environmental concerns, indigenous peoples rights, workers rights, well-being of local communities, and so on in materials selection is either important or it isn't. Period.

Whatever the excuses may have been to this point for not moving forward to require certification of all materials used in buildings, there is no justification for further delay. Development of mining certification programs that focus on observance of laws and regulations; active use of environmental management plans; protection of riparian areas, soil and water quality, biodiversity, and environmentally sensitive areas, including forests; attention to indigenous rights, workers rights, and community well-being; and third party oversight is overdue. The time for action is now.

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