

US SURVEY OF FEDERAL, STATE AND LOCAL INITIATIVES ON SUSTAINABLE/GREEN BUILDING PROGRAMS AND POLICIES

The design and construction of buildings has a tremendous impact on the environment and the use of natural resources. There are more than 76 million residential buildings and almost 5 million commercial buildings in the US. These buildings together use 1/3 of all the energy consumed in the US and 2/3 of all electricity (1996 data). By the year 2010 another 38 million buildings are expected to be constructed. "Typical" buildings consume more of our resources than necessary, negatively impact the environment, and generate a large amount of waste (Center of Excellence for Sustainable Development, a project of the US Department of Energy).

Green Buildings

Green or Sustainable Buildings incorporate the environment, the economy, and human aspects into the building. Green buildings are created as an integrated process. This means the site, the design, the construction, the operation, the maintenance, and the deconstruction of a building are all seen as having an effect on one another. As a result of the integrated approach, buildings are environmentally friendlier, more cost-effective, less wasteful, and offer a healthier work environment. Most green building programs are designed or organized by guidelines, usually accompanied by a checklist or a point system. Typically, the guidelines are divided into sections such as energy use, water efficiency, materials, indoor air quality, and construction waste.

Results and Discussion

A survey consisting of 22 questions pertaining to all facets of green building programs was created. A majority of the interviews took place over the phone. Some however, were conducted via email while other outcomes were a result of website research.

In total, 138 interviews were attempted. As seen in Table 1, a majority of interviews were aimed at the city level. This was not a random sample. The top 100 cities were intended to be the primary focus on this survey. Additionally, certain known programs were specifically interviewed. Results in this table reflect the total number of interviews attempted, not necessarily conducted and completed. The yes column represents whether the agency or organization that was attempted to be interviewed had a green building program. In some cases the existence of a program was determined from website research, but efforts to obtain an interview regarding the program were unsuccessful.

Table 1. Interviews Attempted

Programs in place	Yes	No	Not yet	Never heard back	Total attempted
City	14	36	11	17	78
County	6	8	3	1	18
State	14		1	2	17
Federal	7				7
Other	17	1			18
Total	58	45	15	20	138

In general, there are two types of green building programs, voluntary and mandatory. Overall, a majority of the programs operate on a voluntary basis. At the local levels, cities are starting to adopt these programs and make them mandatory for all municipal buildings. Government agencies are adopting these programs and requiring this type of building for two reasons. Either to act as a role model in order to encourage green building within the private sector, or, simply because they believe this type of building is better all around. Green buildings are perceived to be not only more responsible from an environmental perspective but from an economic perspective as well. As a result, municipalities feel as though public resources will go a lot further with green buildings.

Life-Cycle

Life-cycle analysis (LCA) and life-cycle costing (LCC) are often cited as playing a large role in the process of creating a green or sustainable building program. Although LCA and LCC are often referenced (nearly 80% of the programs interviewed do so) many programs do not seem to be going much beyond simply referencing life-cycle. Just 2 programs out of the 41 interviewed require LCA to be done while only 4 programs require LCC to be done. There are a couple reasons for this. First, this type of analysis is still fairly new and is therefore a timely and costly investment to undertake. Second, the data is very hard to obtain or collect. Most of the LCA that is being done for these programs is oriented toward energy use and indoor air quality issues. Analysis involving materials is much more situational, requiring consideration of many factors.

Nearly all of the programs are concerned about harvesting of old growth and making sure the forests are harvested in a sustainable way. As a result, the use of conventional sawn wood is typically not an option that gains many points in a green building program. Sustainable certified wood is widely recommended and always preferred when using lumber. Occasionally, the use of certified wood only is required. All but three programs in connection with which interviews were conducted, made reference to the use of certified lumber, and a majority specifically referenced FSC. One program that did not mention certified lumber was only because it is not available in that particular region, the US southeast.

In addition to certified wood being referenced, engineered wood products are often referenced as well. The respondents to the interviews indicated that engineered wood products are viewed as a positive alternative to conventional sawn wood for a couple reasons. In regard to environmental concerns, they require less harvesting and result in less waste of wood. Additionally, they are preferred by existing programs for quality reasons. The products are straighter and stronger and are often viewed as better quality than traditional sawn lumber.

There are concerns, however, regarding the use of engineered wood products. A large emphasis of green and sustainable buildings is indoor air quality issues. Adhesives, glues, and finishes that contain formaldehyde are not approved of. Many programs specifically list plywood, particleboard and other composite wood as materials to avoid based on the formaldehyde content of the glues used in them.

Perception of wood

The way green building programs view wood seems to be somewhat inconsistent. Nearly all of the programs are concerned about the harvesting of old growth and making sure the forests are harvested in a sustainable way. Therefore, the use of certified lumber is either highly recommended and preferred, or in some cases required.

Engineered wood products are almost always referenced and often are preferred as well, over the use of conventional sawn wood. In addition, many alternative materials to the use of wood are suggested in the guidelines of these programs. Also, other factors mentioned which influenced how the programs perceived wood were based on regional availability and suitability to the local climate. However, interviewees were quick to point out wood is a renewable resource, is sturdy, and is recyclable. A few also pointed out it has a low embodied energy. Overall, the programs interviewed are not totally sold on the use of wood, although they are not actively opposed to it either. It appears these programs feel the most comfortable using wood under the conditions that the wood is certified or the amount of wood is reduced through the use of an engineered product.

Conclusions/Observations

Green building programs are becoming more common, and will continue to do so. This has been happening for a couple of different reasons. Non-profits and other national organizations and agencies have been creating programs and surviving as voluntary programs. There are enough positive selling points, especially with the use of incentives, to sell this type of building program.

Suggestions and opportunities for industry

Probably the most important issue for the wood products industry to focus on is the perception of wood. There is still confusion and hesitation that comes along with the use of wood. In order to sell wood as a positive building material within these programs, it cannot be emphasized and reinforced enough that wood is renewable, recyclable and has a low embodied energy. From a sustainable or green standpoint, wood makes sense. One big hesitation regarding the use of wood is protecting old growth and harvesting in a responsible manner. The use of certified wood appears to be a solution. Engineered wood is also very popular amongst green building programs. However, because of the concern voiced by interviewees about products with toxic chemicals, it appears that engineered wood will be more likely to receive program approval if programs' fears about toxic materials can be alleviated.

Life-cycle analysis establishes wood is an environmentally positive material to use. There are hesitations and challenges for programs to conduct their own analyses on materials. Therefore, industry should either help supply data and software or have some training on LCA, or alternatively publicize results of previous studies and analyses that have already been done. Many programs focus on energy aspects a great deal. This is either because the program started as an energy program and developed from there or because immediate and concrete results can be measured and demonstrated from energy savings. From an energy efficiency standpoint, marketing of wood having low embodied energy would be beneficial.

Industry should also capitalize on recycling, reusing, and recovering wood and create a market for the reuse of it. Keeping wood out of landfills allows carbon sequestration to continue. In addition, less harvesting would have to occur, using less energy, and it would help the local economy. An example of this is in California, where an integrated wood mill was started, using only salvaged wood. The mill serves as a recycled lumber retail yard and remills dimensional lumber and manufactures products such as tables and architectural millwork.

Table 2. Reference Certified Lumber

Yes	34
Reference FSC only	14
Reference FSC and others	11
Didn't specify certifier	9
No	3
Not Yet	1
Don't Know	1
Total	39