

GREEN BUILDINGS: WHAT'S MISSING

MAKING IT GREEN AND FAIR

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Abstract

As we begin to explore the next generation of sustainable building, we need to recognize what is presently in our definitions of sustainability, but absent in our practice. We have embraced the U.S. Green Building Council's (USGBC) LEED® Green Building Rating System, which exemplifies an economic and environmental approach to sustainable development, but, we need to recognize that something important is missing from the current discussion: equity.

As we are creating healthy and productive work environments for our tenants, we should also be concerned with the living standards, environmental health, and occupational safety of those who produce and install the products that go into our facilities; those who maintain operate and maintain them, their communities, and society as a whole.

Even as we are specifying the most up-to date and seemingly economical products for construction, operation and maintenance, we should be aware of their composition and methods of manufacture. Old formulations can be reengineered to eliminate known, hazardous components.

Equity for all must include provisions for living wages and elimination of toxics. This paper discusses what is missing in today's common application of sustainable development principles – equity; and argues that unless this issue is properly addressed, sustainable development cannot be achieved.

Keywords: Equity, living wage, toxics elimination

Introduction

Is the operation a success if the patient dies?

Building design and construction has been vastly enriched by the application of today's sustainable practices. The result, as we strive to meet "the needs of the present without compromising the ability of future generations to meet their own needs," is buildings that are healthier places to work, use less energy and water, and use recycled and less environmentally harmful materials.

With tools like the U.S. Green Building Council's LEED® Green Building Rating System, green building has moved from simple energy conservation, as in the 1980's, to a broader definition; adding to it sustainable sites, water and energy efficiency, environmentally preferable construction products, finishes and furnishings, waste stream management, indoor environmental quality, and integrated, whole-building design and construction practices.

Transformation of the building market is well under way. We have reached the point where we are confident enough to ask: what's next? How will we deal with climate change, growing populations, decreasing resources and increasing toxic chemicals, and many other problems? And, what high-performance, products, services, design approaches, and construction processes will lead us to create truly sustainable buildings, urban environments, and bioregions?

But, before we move on to these questions, we need to recognize that something important is missing from the current discussion: the patient - that is, all of the "present" generation, not just

those who occupy our buildings. We must also ask: How do our design and construction choices affect everyone in society, including those who build, operate and maintain our buildings through every stage of its lifecycle?

What is Equity?

Equity, or social sustainability, is a broad topic that includes both individual and corporate responsibility. Common in the longstanding discussion of social equity, are the ideas of people's wellbeing, quality of life, and respect. Frederick Douglass, writing in 1881 for North American Review, said: "Neither we, nor any other people, will ever be respected till we respect ourselves and we will never respect ourselves till we have the means to live respectfully."

Part of the difficulty in incorporating social equity has been defining it. There is also some resistance to discussing what we might call the "Kumbaya," or "personal virtue" questions, that must be overcome.

Generally, issues such as respect, quality of life, and well being, have not been addressed in the sustainable development equation. Considering the complexity of the subject, this is not totally unexpected. Currently, the LEED certification template exemplifies an economic and environmental approach to sustainable development. By focusing on two of the three core values of sustainability – Economy, Ecology, and Equity - the USGBC was able to bring together diverse segments of the building industry to create a national standard for high-performance buildings.

But, transforming the market must include equity, as well.

There are unintended consequences in the use of LEED as it is now being used to decide where money is spent on projects seeking certification. With a limited budget, do you risk lowering your LEED rating by paying construction workers a living wage rather than spend your money on a gray water system? Do you install mercury-free switches, even though no credit is given for reducing persistent toxics in the environment? Additional points should be given to projects that address these issues.

In some ways, the current sustainable design movement is beginning to address these issues, particularly where the well-being and productivity of the people who occupy our buildings is concerned. Sick Building Syndrome and Building Related Illness are well-documented problems that have marked effects on the health of the building occupants. Studies have shown that the health and productivity of building occupants is affected by such things as air quality, types of materials used, temperature, humidity, access to the natural environment, and ergonomics, and designers have begun to respond. LEED awards a possible 15 out of 69 points in the area of indoor environmental quality. And, furniture makers have begun to respond to an increase in repetitive strain workplace injuries by developing more adjustable user-friendly workstations.

But what is missing is the broader view. The strength of sustainable development is the recognition of externalities and the integrated nature of its design. We need to think beyond the building itself. Just as we are concerned about our building tenants, so should we be concerned about the well-being of those who build, operate and maintain our buildings - and those who produce our “green” products, and the communities in which they are made around the world.

When we consider the economic, environmental, and social consequences of every business decision we make, there are questions we need to ask. The McDonough Braungart Design Chemistry (MBDC) Cradle to Cradle Design Protocol identifies some of them for us. The protocol helps define the sustainability of products and services and, in its details, begins to make some of those connections to respect, well-being, and quality of life. MBDC's equity questions build upon two simple ideas:

1. Everyone should earn a living wage, and,
2. Employees and customers should be safe making and using products.

The first idea can be characterized as the “equity/wages” issue, and includes the following questions:

- Are employees treating one another with respect?
- Are our employees earning a living wage?
- Are men and women paid the same for the same work?

When we choose a building product or system, we're deciding whether the people who collect the raw materials that go into them, who fabricate, install and maintain them are earning enough for them and their families to live in dignity. And, by the manner in which we design building components, we also decide if workers will be injured by the installation techniques required.

The second idea can be characterized as the “equity/toxics” issue, and includes the following questions:

- Are employees and customers safe making and using our products?

- Is our production safe for the local and global communities?

As building designers, builders, owners and operators, we MBDC asks:

- Are employees and customers safe making and using the products we specify? And, are our tenants safe?
- Are the production and use of those products safe for the local and global communities?

When we choose a building product or system, we're deciding whether the people who collect the raw materials that go into them, who fabricate, install and maintain them, and the communities in which they live, are being exposed to dangerous chemicals and wastes. We're also deciding what will be the level of environmental enforcement and mitigation, and, whether or not to support long-term degradation – or improvement – of the environment.

There are economic, environmental, and social consequences to every business decision we make, whether at home or at work. When we buy a cup of coffee, for example, we're considering the value we get versus the price being asked. And, consciously or not – we're deciding if the people who grow and harvest the raw materials that go into them, and the communities in which they live, are being exposed to dangerous pesticides and fertilizers, and whether or not the workers who made that cup of coffee, and those who grew, harvested, processed and transported it can support themselves and their families with respect.

In the case of coffee and certain other products, we can minimize worker and community exposure to toxics by choosing organically grown. We can also choose third-party certification programs, like Global Exchange, that address the issue of wages.

These same considerations should enter into every design and construction decision we make. As we begin to understand the cornerstones of today's green building models - economical and ecological sustainability - we also need to recognize the third core value of sustainability, social sustainability, or equity. We need to remember that every building product or process has an equity component associated with it, and, in order for it to be truly green, it must also be fair.

Living Respectfully

“Economic development does not occur in a vacuum. The construction and operation of a major factory in most locations on earth in industrialized countries and especially in developing countries - will have significant impacts on lifestyles, social dynamics, and even the culture of the affected region. ... the average, long-term influences of socio-economic development on health can be at least as powerful as the pollution consequences of the related processes. Combine this finding with the reality that there are profound differences in the social influences of new economic output per year from one factor and location to another...”¹

- Greg Norris, Sylvatica

Providing people the means to “live respectfully” is at the core of the equity/wage issue. Living respectfully means earning a living wage – a wage that let's you support yourself and your family with dignity.

Stephanie Luce, an Assistant Professor at the University of Massachusetts-Amherst Labor Center, writes:

“When policymakers talk about sustainable development, the emphasis is often on factors such as the impact of new building on the environment, the use of recyclable and renewable resources, and designing communities in order to minimize excessive transportation requirements and other sources of pollution. Often, the piece that gets ignored in the conversation is labor: the labor that is required in the actual building or production, as well as the working conditions of people who inhabit the community in question.”²

Human labor itself, Dr. Luce writes, must be renewable. Workers need to earn enough money to survive, and to reproduce themselves. Economists refer to this as a subsistence wage. But subsistence wages are often not sufficient to live in dignity. What is needed is a living wage: a wage high enough to allow them to support themselves and their families in a reasonable fashion, without relying on charity, government assistance, or luck just to survive. A living wage is the amount adult wage earners take home sufficient to meet ‘basic needs,’ such as food, clothing, education, water and transportation, housing and energy, and savings.

For communities to achieve sustainable development, Dr. Luce writes, the workers in those communities must be able to sustain themselves.

Living wages provide many personal benefits. Less obvious is the potential to benefit communities by reducing dependence on government subsidies, like food stamps, Medicaid and other forms of assistance and benefit local businesses, by adding more money into the local

economy. Living wages keep families out of poverty, increase economic and workplace stability, and improve the economic health of a community.

Another type of wage is the prevailing wage, which is the minimum wage rate to be paid to laborers and mechanics employed under certain federal contracts. Its purpose is to preserve local wage standards and promote local employment by preventing contractors who bid on public contracts from basing their bids on the use of cheap labor recruited from foreign sources. The prevailing wage is set by the Department of Labor in periodic surveys of all wage rates for an occupation in a local labor market and generally is generally sufficient to enable a full time worker to support a family above the poverty line.

Since the Great Depression, the Federal Government has had specific prevailing wage requirements for certain types of work performed for it:

- In construction projects, the Davis-Bacon Act requires the payment of prevailing wages and fringe benefits, as determined by the Secretary of Labor, to laborers and mechanics employed by contractors and subcontractors.
- In contracts for the manufacture or furnishing of materials, supplies, articles, and equipment, the Walsh-Healey Public Contracts Act includes prevailing wages, maximum hours, prohibitions on child and convict labor, and safe and sanitary working conditions.

The Act's purpose, according to the Supreme Court, was:

“to impose obligations upon those favored with Government business and to obviate the possibility that any part of our tremendous national expenditures

would go to forces tending to depress wages and purchasing power and offending fair social standards of employment.

“As stated in the Report of the House Committee on the Judiciary on the Bill,³

“The object of the bill is to require persons having contracts with the Government to conform to certain labor conditions in the performance of the contracts and thus to eliminate the practice under which the Government is compelled to deal with sweat shops.”⁴

- In service contracts, the McNamara-O'Hara Service Contracts Act of 1965 requires employers to pay prevailing wages and fringe benefits to employees.

Prevailing wages are a good step toward equitably supporting those who provide the Government services, but they are not perfect. In a 1999 study, it was estimated that only 32% of Government contract workers were eligible for prevailing wages. And the study found that 10% of those workers were paid below the poverty level, since prevailing wages are based on local wages.

Still, prevailing wages are a good basis for establishing equitable contract rates and should be a fundamental consideration for all aspects of design and construction. Many bio-based products are rapidly renewable, but under what conditions do the workers who harvest and process them, in the U.S., in China, India – and around the world - live and work?

The choices we make in specifying products and services at any point in their life cycle have equity consequences. This is why we need to ask, as William McDonough does, “Are those

associated with making and providing the products and services you specify earning a living wage?

The building industry alone, (not including manufacturing of the products), is one of the nation's largest industries, employing about 15 million in construction, operations and maintenance. We must be sure that all associated with design, construction, operation and maintenance of our projects are receiving a living wage.

Wellbeing

“Even in the face of scientific uncertainty, society should take reasonable actions to avert risks where the potential harm to human health or the environment is thought to be serious or irreparable.”

- The President's Council on Sustainable Development ⁵

Preventing exposure to persistent, dangerous substances is at the core of the equity/toxics issue. The reason is simple: toxics can cause severe illness, poisoning, birth defects, disease, or death.

And sustaining a healthy quality of life is vital, as well. Everyone should be safe making and using products the products we specify at every stage of their life-cycle. Wherever possible, less environmentally harmful substitutes and processes should be used. And, to the extent that no reasonable substitutes can be found, toxics should be subject to strict, plant-wide monitoring under closed-loop control, including sensor fault detection, loop performance monitoring and disturbance detection.

Toxic chemicals are widely used in manufacturing, suggesting that we must avoid strategies that simply shift hazardous materials from one place to another, rather than eliminating them. The choices we make in specifying products and services that generate toxics at any point in their lifecycle have equity consequences. We need to ask, as William McDonough does, “Are workers safe making and using the products? Are your tenants safe?” And, “Are the production and use of those products safe for the local and global communities?”

One strategy is toxics reduction and elimination, and pollution prevention. The basic ideas of toxics reduction are the same as those of public health programs: prevention, education, technical assistance, and voluntary action. Reducing the hazards of industrial processes avoids worker exposure, bringing environmental protection together with disease protection to them, their families and communities. By minimizing or eliminating the use and production of hazardous substances we also protect our air, water, soil, and food chain. And, finding alternative and substitute product for hazardous materials used in industrial processes and by consumers reduces the overall harmful effects both to human health and to the environment.

Many of these ideas can be found in the National Environmental Protection Act of 1969 (NEPA) that governs direct, indirect, and cumulative environmental impacts of Federally-funded projects. As stated in Section 101 of the Act, Congress recognized the profound impact of man’s activity on the interrelations of all components of the natural environment, particularly the influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances, and required The Federal government to use all practicable means to:

“(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”⁶

The Government's strategies today, are waste minimization, pollution prevention, technology innovation, toxicity reduction, waste reuse, and others; all aimed at the goal of not generating problems in the first place. Three major federal laws are at the core of federal hazardous waste regulation:

- Resource Conservation and Recovery Act of 1976 (RCRA) - regulates solid and hazardous wastes, establishing a “cradle-to-grave” system for tracking and permitting hazardous wastes from their point of origin to their disposal—and thirty years beyond. Land disposal of hazardous chemicals is banned, and source reduction, encouraged.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also known as “Superfund,” regulates the ways in which existing businesses dispose of hazardous waste and is intended to clean up abandoned, inoperative, contaminated sites. The Superfund Amendments and Reauthorization Act of 1986

(SARA) requires disclosure of hazardous waste sites under community and worker “right-to-know” regulations.

- Toxic Substances Control Act of 1976 (TOSCA) gives regulators and the general public advance warning that manufacturers are considering commercial production of a substance that may be toxic. Manufacturers submit a notification to the government along with detailed data and must win approval before proceeding.

Various Executive Orders (EO) address toxics reduction. EO 13148, "Greening the Government through Leadership in Environmental Management" (April 2000), directed the Environmental Protection Agency (EPA) “to develop a list of not less than 15 priority chemicals used by the Federal Government that may result in significant harm to human health or the environment and that have known, readily available, less harmful substitutes.” In developing the list, EPA is considering: toxicity, persistence, and bio-accumulation, availability of less environmentally harmful substitutes and processes, relative costs of alternatives, and the potential risk from chemicals used by Federal agencies. The EO directed Federal agencies to reduce the usage of these chemicals by 50% by December 31, 2006.

The first five chemicals to be identified are cadmium, lead, polychlorinated biphenyls (PCBs), mercury, and naphthalene. The Federal Environmental Executive (OFEE) notes that there are known alternatives to the five priority chemicals or products containing them. For example, electronic thermostats can be used in place of mercury-bearing switches. Solders containing copper or silver can substitute for solder containing lead, and, integrated pest management can be used in place of naphthalene.

However, many toxics remain in new and existing buildings. We're still using urea formaldehyde in foam insulation and plywood, producing dioxin and phthalates in vinyl tiles and siding; chromium and arsenic in treated wood; VOC's in paints, sealants, caulking, and adhesives, chlorine in cleaning products, and many others.

Making Better Choices

No responsible designer consciously makes bad choices. Once we recognize and accept the core ideas in this discussion: living wages and eliminating toxics, we need to ask: How can these ideas be applied to create long-term value?

Fortunately, you can affect have a major effect on the quality of life in these areas by asking questions. You can ask manufacturers: Is this product associated with any substances classified by the Environmental Protection Agency as "extremely hazardous" or "CERCLA hazardous substances?" If so, ask if use of the substance can be reduced or eliminated; or if not, if it is maintained in a controlled, closed-loop system.

The question of living wages is more difficult than choosing less toxic alternatives, but equally important. Remember that you are deciding, in some manner, whether or not the workers who produced, install and maintain the products can support themselves and their families with respect.

Consider the case of bamboo flooring. Lloyd Alter, and others, writing on the Treehugger.com website ⁷ notes that as a green building product, bamboo is a rapidly renewable resource that

matures in three years, regenerates without need for replanting, and requires minimal fertilization or pesticides. But what are the equity aspects of bamboo? There may be unintended consequences resulting from its use.

Bamboo is a huge industry. In China alone, it is estimated that 4.5 million farmers and 1.1 million processors worked full or part-time in the bamboo industry (1999), and more than 600 million people worldwide rely on income from it.⁸ But there is no “fair trade” organization that certifies that farmers and workers received a fair price for their product, so that they can feed their families and send their children to school instead of working in the fields. One major producer of bamboo, Burma (Myanmar) has been cited by the U.S. Department of State for restricting worker rights, banning unions, and using forced labor in the military-owned industrial zones.⁹

And, no organization certifies that bamboo is being managed sustainably. Because of its success as a versatile wood substitute, some bamboo expansion has come at the expense of natural forests and their biodiversity, and low-yield mixed plantations. Clearcutting has resulted in an increase in erosion until the bamboo becomes fully established. Some bamboo plantations use chemicals (pesticides, weed killers and fertilizers) which also affect the environment and the people growing the bamboo.¹⁰

Fabrication of bamboo products, such as flooring, should also be scrutinized. Almost all bamboos have formaldehyde binders, since suitable non-formaldehyde glues are significantly more expensive. Non-formaldehyde glues usually contain isocyanates, which don't off-gas when dry, but are toxic for the workers at the mill. As Dan, on the Treehugger.com website writes, “By insisting on non-formaldehyde glues ... we may be avoiding a tiny environmental hazard by

creating a much larger one for workers in other countries. That's why European flooring manufacturers generally refuse to switch to non-formaldehyde glues - they are protecting their workers.”¹¹

Design for Safety in Construction and Operation

Designers know their first responsibility is the health, safety and welfare of everyone in the workplace, including people with disabilities. What is less commonly recognized is the application of this responsibility to the workers who create the workplaces and those who operate and maintain them. This is slowly beginning to change.

Many in the area of occupational safety and health are looking at ways construction worker safety and ergonomics can be improved. Research by the Occupational Safety and Health Programs of the Labor Education Research Center at the University of Oregon, suggests that addressing safety and health hazards in the design and planning phases of construction projects can yield significant improvements in safety and health outcomes for construction workers. Studies include working with concrete laborers involved in the placement of pumped concrete to identify work tasks high risk for strain and sprain injury and potential for intervention to reduce those risks, and training for pulp and paper workers to address chemical and noise hazards in the pulp and paper industry.¹²

A Good Definition:

In a report to the Vancouver, Canada, City Council, the Director of Social Planning, in consultation with the Manager of the Sustainability Group, defined four guiding principles of social sustainability:

“1. Equity – when individuals have access to sufficient resources to participate fully in their community and have opportunities for personal development and advancement and there is a fair distribution of resources among communities to facilitate full participation and collaboration. Inequities can be minimized by recognizing that individuals and groups require differing levels of support in order to flourish, and that some individuals and groups are capable of contributing more than others to address disparities and promote fairness of distribution. Lower levels of disparity in societies result in longer life expectancies, less homicides and crime, stronger patterns of civic engagement and more robust economic vitality.

“2. Social inclusion and interaction – both the right and the opportunity to participate in and enjoy all aspects of community life and interact with other community members; where the environment enables individuals to celebrate their diversity and react and act on their responsibilities. Social exclusion limits the levels of involvement and impedes optimal healthy development of individuals and the community as a whole.

“3. Security - individuals and communities have economic security and have confidence that they live in safe, supportive and healthy environments. People need to feel safe and secure in order to contribute fully to their own well being or engage fully in community life.

“4. Adaptability – resiliency for both individuals and communities and the ability to respond appropriately and creatively to change. Adaptability is a process of building upon what already exists, and learning from and building upon experiences from both within and outside the community.”¹³

Conclusion: Making It Green and Fair

Sustainable facilities are those that balance economic prosperity, environmental quality and social equity, today. They:

- are developed through an integrated design process that considers the interrelationships among all building components and systems and their connection to society and the environment, to achieve maximum cost and operational efficiencies.
- avoid the unintended consequences of our choices.
- reduce the need for environmental mitigation by eliminating toxics and minimizing waste.
- increase worker safety and well-being, and,
- create long-term value.

There is nothing that prevents us from considering social sustainability, except perhaps, the will to do so. Just as the Government is not “compelled to deal with sweatshops,” and is taking positive steps to reduce generation of toxics in the environment, so should all of us who are involved in the built environment and the World.

So, how do we bring social responsibility and society into our built environment? We do it by creating long-term value through our choices. We remember that every purchase we make - every business decision - has economic, environmental, and social issues associated with it.

Fortunately, for many products, today, you can affect the quality of life in these areas by making informed choices.

GSA is meeting equity goals of paying prevailing wages and incorporating toxics reduction and pollution prevention at no additional cost

You can call for a living or prevailing wage to be paid to those associated with the design, construction, operation and maintenance of the goods and services you specify and that people are safe making and using them.

As Ray Anderson writes in his book, ““Mid-Course Correction,” voluntarily participate in EPA and Department of Labor programs; share your vision and internal framework for sustainability with suppliers, and press them to follow and document sustainable practices, and favor those that do.”¹⁴

Let’s make the built environment green and fair

“[Green building] practitioners, while maintaining the need to be practical and profitable in the conventional sense, are following Einstein’s insight that no problem can be solved by the same consciousness that created it. So rather than trying to be “less bad” or more efficient within the framework of conventional design, they are innovating, enhancing the

positive impacts of human activity and leaving the world a better place for having been here.

“The impact of this shift is growing. In the realm of product design, we see safe, healthful materials that can be perpetually recovered and re-manufactured, effectively closing the loop on material flows. We see buildings designed to generate more energy than they consume and green-roofed manufacturing plants that create habitat, restore landscapes, and cost-effectively filter storm water while also providing safe, comfortable places to work. We see public facilities with operations that approach the effectiveness of natural systems which also offer delightful, refreshing places to meet, confer and learn. From this perspective, one can ask, not “How can I meet the minimum standards for building design?” but “How can I enhance the economic, ecological and social health of those who construct, work in, and live near my facility?””¹⁵

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