Introduction and Background Considerations

Scholars, policymakers, and the general public increasingly recognize that today's choices directly affect the quantity and quality of resources remaining for our children and future generations. The responsibility of one generation to future generations, and the rights of future generations vis-à-vis a contemporary population, are fundamental principles of sustainable development. Both the green building and new urbanist movements are important applications of sustainable development principles in the building and development sectors. Increasingly, all sustainable development activities are coming within the purview of public and private sector efforts to address global climate change.

Generally speaking, “green buildings” are facilities designed, built, operated, renovated, and disposed of using ecological principles for the purpose of promoting occupant health and resource efficiency while minimizing the building's impact on the natural environment. Resource efficiency means efficient use of energy and water, appropriate use of land and landscaping, the use of environmentally friendly materials, and minimizing the life cycle effects of the building's design and opera-
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tion. By increasing a building’s efficiency, operation and maintenance costs are reduced, as is the building's impact on the natural environment. Green buildings also produce enhanced indoor environmental quality, resulting in increased health and productivity for the building occupants. Since the early 1990s, the green building movement has grown from a few isolated pilot projects to internationally recognized standards impacting all facets of the real estate industry.

New urbanism allows for the application of sustainable development principles at the regional, neighborhood, block, street, and building levels. As the green building movement shifts its focus from individual buildings to the block, city, and region, developers and local policymakers will seek to apply principles of sustainable community design in new policies and regulations. Accordingly, new urbanist principles will increasingly lead to departures from, or the transformation of, existing zoning and subdivision codes.

The media is brimming with images of polar ice caps melting, sea levels rising and statistics showing the earth’s temperature steadily increasing. These hallmark images and statistics of climate change often are accompanied by scientists discussing the cause of these changes and how to address them. Although not unanimous, most scientists place the blame for climate change squarely on human action, and specifically on anthropogenic greenhouse gas (GHG) emissions. For this majority, the logical manner for addressing climate change is by altering human behavior to reduce GHG emissions.

With scientific evidence and popular support on their side, state and local lawmakers throughout the United States have taken it upon themselves to reduce GHG emissions. The attention of state and local lawmakers to climate change has led to the proliferation of various laws regulating GHG emissions (both directly and indirectly). As one of the major sources of GHG emissions, buildings have received much of the state and local regulatory focus. Buildings consume 39% of all energy in the United States and 72% of the nation's electricity, while producing 39% of the country’s greenhouse gas (GHG) emissions.1 Statistics show that buildings are responsible for more GHG emissions than either industry or transportation, and also show a continual increase in the level of GHG emissions from buildings. As a result, all decisions about real estate will increasingly be subject to carbon reduction considerations, and all green building and sustainable development activities will occur under the broader umbrella of climate change regulation. This regulatory framework may cause increased costs for developers not accustomed to sustainable development techniques, but the resulting energy and resource efficient buildings will greatly reduce operating costs as these regulations create a carbon premium through increased utility rates for non-green buildings.

While environmental gains have been rolled back during the first decade of the 21st century, and other components of the environmental movement are having difficulty getting attention and maintaining traction, the green building movement is growing exponentially. Several hundred million square feet of commercial and institutional buildings have been designed and built to obtain green building certification. In the residential construction sector, thousands of homes are being built to green specifications and rated by a variety of state and local green building organizations. One of this movement’s hallmarks has been centralized certification programs for larger commercial, institutional, and high-rise residential buildings and more local, decentralized certification programs for family housing and land development. Industry buy-in to both major sectors (commercial and residential) has contributed significantly to the green building movement’s success.

The green building movement in the United States became more visible in the late 1990s with the advent of the Leadership in Energy and Environmental Design (LEED) Green Building Rating System created by the U.S. Green Building Council (USGBC). While LEED has popularized the notion of high-performance green buildings, the roots of the present movement date further back.
I. History of Green Building

The modern U.S. green building movement can trace its origins to the oil crisis of the 1970s when Arab-Israeli conflicts resulted in a flowering of innovations in energy conservation and renewable energy systems. Owners retrofitted homes and other buildings with high levels of insulation, energy efficient appliances and heating/cooling systems, and solar energy hot water systems. As a result, the federal government began to provide tax credits for investment in solar energy and funded development and testing of innovative technologies ranging from solar air-conditioning to eutectic salt energy storage batteries. By the late 1970s, new efficiency standards were embodied in model energy codes adopted by several states. After this burst of activity, however, interest in energy conservation waned as energy prices declined.

Although many energy-efficient buildings emerged after the oil crises of the 1970s, the first U.S. buildings to consider a wider range of environmental and resource issues did not materialize until the 1980s. The earliest examples of green buildings were the result of major U.S. environmental organizations utilizing holistic approaches for the design of their office buildings. In 1985, the Environmental Defense Fund hired William McDonough to design its New York office. The design featured natural materials, natural lighting, and excellent indoor air quality—all part of a green solution for then-endemic “sick building syndromes” resulting from poor indoor air quality and related problems such as toxic mold. In 1989, the architecture firm of Croxton Collaborative designed the offices of the Natural Resources Defense Council in the Flatiron district of New York City. In this project, the designers employed natural lighting and energy-conserving technologies to reduce energy consumption by two-thirds compared to conventional buildings. The 1992 renovation of Audubon House, also in New York City, was another significant early effort in the contemporary green building movement. The National Audubon Society sought to reflect its values as a leader of the environmental movement, and directed the Croxton Collaborative to design the Audubon Society building in the most environmentally friendly and energy-efficient manner possible. The project required extensive collaboration by many building team members and provided a model of the cooperation that now characterizes the green building process in the United States.¹

The late 1980s and early 1990s saw a renewed interest in energy and resource conservation as society began to seriously consider complex global environmental issues such as ozone depletion, climate change, and the destruction of major fisheries. During this same time period, a variety of events focused increased attention on the environmental impact of building and development patterns.
First, in 1987, the United Nations Commission on Economic Development commissioned a report known as both the “Brundtland Report” and “Our Common Future.” This report defined the term “Sustainable Development” as “development that meets the needs of the present without compromising the ability of future generations to meet their needs,” and focused international attention on the threat to economic and social welfare posed by development trends.

In 1992, the American Institute of Architects (AIA) established its Committee on the Environment (COTE), which established a body to guide the architecture profession’s attention towards green building issues. Also in 1992, the United Nations Conference on Sustainable Development, commonly known as the Rio Conference, resulted in the Rio declaration on Environment and Development, and statements on forest principles, climate change, and biodiversity.

A 1993 joint meeting of the International Union of Architects (UIA) and the AIA, known as “Architecture at the Crossroads” also precipitated the American resurgence in sustainable construction. The UIA/AIA World Congress of Architects promulgated the Declaration of Interdependence for a Sustainable Future, which articulated a code of principles and practices to facilitate sustainable development.

In the residential sector, the city of Austin, Texas created a green building program in the early 1990s that marked the start of applying sustainability principles to homes and land development. Green building efforts in this sector began to spring up all over the U.S., including Kitsap and Clark counties in Washington State, Denver, Baltimore, and New Mexico. The National Association of Home Builders responded by creating a template for its member organizations around the country to adopt for the purpose of establishing green building rating systems.

The first highly publicized green building project in the U.S., the “Greening of the White House,” was initiated in 1993, and included renovation of the Old Executive Office Building, the 600,000-square-foot structure across from the White House. A wide array of architects, engineers, government officials, and environmentalists participated in the project, drawing national attention and producing sizable results, including dramatic energy cost savings (about $300,000 per year), emissions reductions (845 tons of carbon per year), and significant reductions in water and solid waste management costs. The success of the White House project spurred the federal government’s sustainability efforts and prompted the U.S. Post Office, the Pentagon, the Department of Energy, and the Government Services Ad-
administration to address sustainability concerns within their own organizations. The National Park Service also opened green facilities at several parks, including the Grand Canyon, Yellowstone, and Denali. The Naval Facilities Engineering Command (NAVFAC), the U.S. Navy’s construction arm, began a series of eight pilot projects to address sustainability and energy conservation concerns. The highly visible effort at its 156,000-square-foot, 150-year-old headquarters in the Washington Navy Yard reduced energy consumption by 35 percent and resulted in annual savings of $58,000.

In addition, several important guides to green building or sustainable design appeared in the early to mid-1990s. The Environmental Building News, first published in 1992, remains an independent, dispassionate, and authoritative guide to sustainable construction. In 1994, the AIA first published its “Environmental Resources Guide,” followed by a more detailed version in 1996. The “Guiding Principles for Sustainable Design,” produced by the National Park Service in 1994, provides one of the first overviews of green building production. Similarly, the “Sustainable Building Technical Manual” was developed and published jointly by the U.S. Department of Energy and Public Technology, Inc. in 1996. The Rocky Mountain Institute’s “A Primer on Sustainable Building,” published in 1995, also contributed to the public understanding of sustainable construction.

II. USGBC LEED Green Building Rating System

Formed in 1993, the U.S. Green Building Council is headquartered in Washington, D.C. It held its first annual meeting in March 1994, which featured keynote speakers Paul Hawken, who had just completed the groundbreaking book, Ecology of Commerce, and William McDonough, recognized as one of the major architectural figures in the U.S. green building movement and the author of The Hannover Principles. Early articulations of the organization’s LEED standard appeared at this time, along with green building standards the American Society for Testing and Materials (ASTM) developed. The ASTM standards were eventually set aside in favor of the USGBC’s LEED assessment standard.

Four years after this initial meeting, the USGBC officially launched its first test green building rating system, LEED Version 1.0. The Federal Energy Management Program sponsored a pilot effort to test LEED Version 1.0 and evaluate 18 projects comprising more than 1 million square feet. A greatly improved LEED 2.0 was launched in 2000, establishing a ratings scale where the highest performing building could earn 69 credits. It also provided for four levels of building certification: Platinum, Gold, Silver, and Bronze. USGBC published a further refined LEED 2.1 in 2003, changing the lowest level of certification (Bronze) to the desig-
nation “Certified.” The formal name of LEED 2.1 was modified to include New Construction (NC), distinguishing it from LEED Rating Systems for other applications; currently it is known as LEED-NC 2.2. Other LEED Rating Systems in various stages of adoption or development include LEED-EB, for existing buildings; LEED-CI, for commercial interiors; LEED-H, for homes; LEED-ND for neighborhoods; LEED for Schools; LEED for Retail; LEED-CS, for core and shell; and LEED for Health Care.

The USGBC continues to develop the LEED standards. For example, on June 27, 2007, USGBC began mandating that all LEED-NC projects registered after June 27, 2007 attain at least two “Optimize Energy Performance” points, which require projects to demonstrate specified improvements in energy performance over baselines set forth in the rating system. Previously, a project could achieve LEED certification without having any energy points. At this time, the mandatory “Optimize Energy Performance” points do not extend to projects registered under LEED for Homes or LEED for Neighborhood Development. The USGBC expects that the new mandatory energy points will improve energy performance of new construction by 14% and existing buildings by 7%.

As of December 2008, 15,609 buildings have been registered under the LEED program.6 Of those, USGBC has awarded 2,024 buildings certification.7 The vast majority of these are the 1,361 buildings certified under the LEED-NC, the rating system most applicable to new buildings.

As part of its ongoing efforts to improve LEED, USGBC is finalizing LEED 2009, a new version of the rating system. This new version reorganizes the existing LEED Rating Systems, while adding several key advancements. The changes included as part of LEED 2009 focus primarily on (i) LEED Prerequisite/Credit alignment and harmonization, (ii) predictable development cycle, (iii) transparent environmental/human impact Credit weighting, and (iv) regionalization.

III. The GBI Green Globes Building Rating System

Developed in part by ECD Energy and Environment Canada, the Green Globes environmental assessment and rating system represents more than nine years of research and refinement by a wide range of prominent international organizations and experts. The genesis of Green Globes was the British green building rating system—the Building Research Establishment Environmental Assessment Method (BREEAM)—initially developed in 1992. BREEAM was first used in Canada in 1996 when the Canadian Standards Association published BREEAM Canada for Existing Buildings. In 2004, the Green Building Initiative (GBI) acquired the rights to distribute Green Globes in the United States. GBI also committed to continually
refining the system to ensure that it reflects changing opinions and ongoing advances in research and technology, as well as involving multiple stakeholders in an open and transparent process. In 2005, GBI became the first green building organization to be accredited as a standards developer by the American National Standards Institute (ANSI) and began the process of establishing Green Globes as an official ANSI standard.

On July 9, 2008, international real estate financial and professional services firm Jones Lang LaSalle (JLL) announced its acquisition of ECD Energy and Environment Canada—the developer of the technology underlying Green Globes. Under the terms of the acquisition, GBI will continue to operate Green Globes independently from JLL.

IV. Government Incentives and Requirements

Although new laws regulating buildings vary widely, they typically apply green building standards to new construction and substantial renovations. Generally speaking, early enactments addressed public sector buildings through green building mandates and private sector buildings through green building incentives. Since the early enactments, new regulations have become increasingly broad, including mandates by several local governments applying green standards to private sector buildings. Based on the political atmosphere surrounding climate change issues, the application of mandatory green building standards to the private sector will not only continue, but may eventually encompass existing private sector buildings.

Although the trend toward regulating private sector buildings is clear, the origin of future regulations is still an open question. While state and local governments took an early lead in addressing climate change, the future bodes well for regional pacts and federal regulation.

V. Conclusion

The high-performance green building movement in the U.S. has already had an enormous impact on how buildings of all types are being designed, built, and operated. The hallmark of this movement has been multisector collaboration between the government, building owners, architects, engineers, builders, and the construction materials industry. As a result of the orchestration of this wide-ranging collaboration, the USGBC has emerged as the leader of the effort to produce a new class of buildings that respond to higher energy prices, human health concerns, and global environmental problems. This movement will likely continue to
strengthen and gain even more influence, and certification standards will continue
to develop as new technologies emerge. Attorneys practicing in the development
arena should continue to seek information about emerging trends in green build-
ing and sustainable development.

Notes

1. An excellent detailed overview of the history of the U.S. green building movement can be found
in the “White Paper on Sustainability,” published by Building Design & Construction magazine in
November 2003, and available at www.bdcnetwork.com. This white paper also contains other im-
portant background information about the green building movement and suggests an action plan to help
improve and ensure the quality and outcomes of green building design and construction.

2. World Commission on Environment and Development, OUR COMMON FUTURE (Oxford University
Press 1987).

3. BuildingGreen, Inc. publishes Environmental Building News and also produces a range of other
useful products, including the GreenSpec Directory. Its publications are all also available online by sub-

4. The “Environmental Resource Guide” is a thorough guide to the environmental and resource
implications of construction materials. The first version was published by the AIA in 1994; the second,
expanded version was published by John Wiley & Sons, Inc., in 1996.

5. The National Park Service’s “Guiding Principles of Sustainable Design” can be found online at
www.nps.gov/dsc/d_publications/d_1_gpsd.htm.


7. Green Building by the Numbers, USGBC, August 2008, available at http://www.usgbc.org/Show-

8. For information on local government green building initiatives, see the Government Green Build-
ing Programs Inventory maintained by the University of Wisconsin-Extension. This resource can be
accessed online at http://www4.uwm.edu/shwec/GovtGreenInventory.pdf.