REAL ESTATE ISSUES®

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Special Focus Issue: Understanding The Business of Green

Shifting the Sustainability Paradigm: From Advocacy to Good Business
Ujjval K. Vyas, Ph.D., J.D., and Susanne E. Cannon, Ph.D., CRE

Weather-Related Losses in the Built Environment: Societal Change and Climate Change
Roger Pielke, Jr.

Selling and Governing the Green Project: Owner Risks in Marketing, Entitlement and Project Governance
Paul D'Arelli, Esq.

Greening the Standard of Care: Evolving Legal Standards of Practice for the Architect in a Sustainable World
Frederick F. Butters, FAIA, Esq.

Trust, but Verify: Building Enclosure Commissioning in Sustainable Design
Daniel J. Lemieux, AIA

Expanding the Principles of Performance to Sustainable Buildings
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Blinded by the (Green) Light: The Rise of Environmentalism and a New Vocabulary–Four Perspectives
Richard Shields

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Sustainability has become the watchword for imagining a new utopia where the relationship of the human endeavor with the natural world is properly aligned to the benefit of both. But this, like all utopias, lies in the future. The present is a dichotomous public conversation between those wishing fervently for this utopia and those that ostensibly cling to an outmoded and dangerous way of thinking. It is hard to believe that this has anything to do with the practical and profit-driven world of real estate. And yet, sustainable development, sustainable building, corporate social responsibility, climate change policy, greenhouse gas emission trading, federally mandated reductions in building energy consumption and the ever-present marketing of green are just the tip of the iceberg forcing a new conversation onto those who hold, build, operate and invest in real estate assets.

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Weather-Related Losses in the Built Environment: Societal Change and Climate Change
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Economic losses due to extreme weather events such as floods and tropical cyclones have increased dramatically in recent decades. Despite concerns among many scientists about the relationship of greenhouse gas emissions to climate extremes, the major reason for these losses is population growth and the location of property in harm's way. Looking to the future, the role of societal development will almost certainly continue to overshadow projected changes in the frequency and/or intensity of storms and floods. This means that effective policies to address ever-escalating losses must focus on what, how, and where we build in regions prone to extreme events.

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Selling and Governing the Green Project: Owner Risks in Marketing, Entitlement and Project Governance
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While critical thinking about the legal issues spawned by utilization of third-party green building rating systems is in its infancy, many reasons for concern are already apparent. Owners and developers seeking green certification must have sound strategies for managing risk relating to emerging legal matters. This article discusses issues that the development community is facing regarding entitlement and marketing of green projects. The desire to publicize a project's proposed green certification and performance targets can result in expectations of tenants, purchasers, government agencies and other third parties regarding a performance outcome. Where outcomes are not achieved, parties with unmet expectations may seek recourse against the owner/developer. The article also identifies challenges inherent in providing a governance structure for mixed-use and multi-building projects. Such governance is necessary to minimize the likelihood that the certification and performance objectives of the master developer could be compromised by developers of various project components or by the end users.

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Greening the Standard of Care: Evolving Legal Standards of Practice for the Architect in a Sustainable World
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As energy costs escalate, more building owners expect their architects and engineers to provide advice related to sustainability. When owners rely on that advice to guide their decisions, unmet expectations create a new source of risk for the design professional. It is important for owners to understand the consequences of their sustainable design decisions and the degree to which reliance on the design professional's advice is prudent. Similarly, design professionals must understand the impact sustainable design principles have on client expectations and the design professional's own evolving standard of care. This article outlines the foundation for successful management of this risk for both owner and design professional.

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Trust, but Verify:
Building Enclosure Commissioning in Sustainable Design

Daniel J. Lemieux, AIA

Optimum building performance begins at conception. That is both the premise and the promise of the Building Enclosure Commissioning (BECx) process. The traditional Commissioning (Cx) process has long held that optimum building performance can be achieved through the proper design, balancing and operation of base-building mechanical systems. The BECx process builds upon that notion by: a) recognizing the rapid pace at which building enclosure systems and technologies continue to evolve; and b) mandating that a design professional well-versed in building enclosure design and failure is given an opportunity to positively influence the direction and outcome of a project. This article explores the changing role of the architect in the design and construction process, the building enclosure commissioning process itself, and examines a case study in building enclosure failure investigation and repair to illustrate the potential of the BECx process in sustainable design.

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Expanding the Principles of
Performance to Sustainable Buildings

James E. Woods, Ph.D., P.E.

Criteria with which to measure and evaluate actual building performance are seldom defined in objective and measurable terms. As a consequence, accountability is imprecise and risks of unfulfilled promises are incurred for the performance of buildings during both normal and extraordinary conditions. This article reviews the concepts and principles of defining and measuring building performance in terms of health, safety, security and functionality in response to physical and social forces; introduces the concepts of resilient building performance and residual risk; explores the status of the existing building stock in terms of energy utilization and indoor environmental quality; and suggests an approach to managing residual risks through a quantitative process of building diagnostics. The article concludes that assuring building performance through continuous accountability, which is similar to that used in other aspects of successful business practice, enables the owner to periodically determine if he or she has made a good investment.

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Sureties play an important role in guaranteeing building performance. Almost all governmental projects on the federal, state and municipal level statutorily require the use of surety bonds as a result of the passage of the Federal Miller Act and the Little Miller Acts adopted by the states. Sustainable building rating systems and benchmarks have been legislated in several states, towns and counties throughout the U.S. Several federal agencies also require the use of sustainable building rating systems. As sustainable building becomes fixed into the statutory and regulatory framework, the surety's role is increasingly implicated. These implications will require thoughtful and creative risk management tools for owners, project stakeholders, public works contractors and their insurers and sureties that view sustainable buildings as high-performance building assets with objective and quantifiable performance criteria.

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Green Building Representations and the
Emerging Potential for Securities Fraud Liability

Brian D. Anderson, Esq.

All public companies are required to file detailed disclosures on their activities with the United States Securities and Exchange Commission (SEC). A growing number of those companies are investing in green building practices and certification. An informal survey of recent securities filings citing to the United States Green Building Council (USGBC) and USGBC's certification program, the Leadership in Energy and Environmental Design (LEED®), reveals that some filers are including potentially inaccurate or unqualified statements regarding the benefits of green building practices and/or LEED certification. Such inaccurate or misleading statements may give rise to liability under the anti-fraud provisions of federal securities laws.

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Legal Issues Arising Out of Green Building Legislation

Stephen T. Del Percio, Esq.

Many state and local governments have enacted legislation relating to the environmental impact of building construction and operations. The resulting green building mandates and incentives often involve compliance with an independent, third-party rating system over which a local government exercises no control. Much of this legislation has been passed without consideration of broader legal ramifications, which this article explores with both real and theoretical examples. In addition to some of the more likely problems that might be encountered, the author cites federal case law to describe scenarios involving constitutional and antitrust issues that may apply. The article also takes a look at problems within the rating systems themselves that could be used in legal arguments. The author concludes that enacting green legislation without considering how it might engender litigation could ultimately work against progress in environmental conservation.

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Energy Performance in Residential Green Developments: A Florida Case Study

Pierce Jones, Ph.D., and Ujjval K. Vyas, Ph.D., J.D.

Housing plays an important role in decreasing the overall U.S. energy consumption. To promote energy efficiency in the residential sector, utilities and governments are increasingly relying on incentives linked to "green certification" protocols. Programs like USGBC LEED®, Green Building Initiative's (GBI) Green Globe or other recognized rating system account for many aspects of home energy use, but they fail to measure real energy consumption rates of buildings after certification.

This article presents data showing that in 2006, Florida's first ENERGY STAR® homes are still more energy efficient than conventionally built homes, but not by as much as they were in 2000. These results can be viewed optimistically, but also clearly point to the need for credible energy consumption data on which to build practical policies to effectuate change.

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The Rise of Environmentalism and a New Vocabulary

Richard Shields

The United States Green Building Council's LEED® Rating System has become the benchmark for sustainable design. Its widespread acceptance and adoption as a regulatory and programmatic requirement in local, state and federal developments focuses attention on the importance of green design. But, it also generates questions as to how to measure such certifications. The new LEED-ND standard is a move in this direction. Finally, as the LEED system is becoming a requirement of governments, the careful use of LEED certification in the marketing of projects seeking or receiving LEED certification must be assured.

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Editor's Statement

BY MAURA M. COCHRAN, CRE, SIOR

"Like any professional, an architect is simply an educator."

ONE OF THE GREAT BENEFITS OF MY JOB as editor in chief of *Real Estate Issues* is that I have the opportunity to read all of the wonderful manuscripts that the members of The Counselors submit for review. Often I find that I forward them on to professional associates and to my colleagues in the firm. In the case of Fred Butters' article on "The Greening of the Standard of Care," I even appropriated (with full attribution to Fred) his comment that, "Like any professional, an architect is simply an educator." I have integrated this observation into our approach at Bartram & Cochran, and I trust that it characterizes our work with clients. Indeed, for all of us, clients engage Counselors precisely because we offer particular expertise and insights. Each of us has an obligation to ensure that we enlighten clients, dispel myths and preconceived notions, and provide expert advice that helps them realize and sustain their own objectives. In fact, I found myself sharing many of the submissions for this edition of *Real Estate Issues,* and we distribute REI as an ongoing marketing and communications tool with many of our clients.

The theme for this issue of REI was first conceived in 2007 when Susanne Cannon, director of the Real Estate Center at DePaul University, along with her associates, decided to present a conference on the business, moral, practical and legal aspects of "going green." That three-day forum created a buzz in the industry, and Susanne soon thereafter applied for a grant from CRE's James Gibson Trust Fund to create a monograph of the presentations. That effort evolved into our identifying the need for this edition of *Real Estate Issues*.

This issue includes a range of relevant topics that begins with why "green" is important, how the process is governed, how the AIA has changed its position from being educators to advocates, and other associated ethical, legal and sustainability issues. The articles enable the readers to understand the evolution of "going green," and the very real problems that can be concealed behind the "glitter" of pursuing and obtaining a LEED® certification. We all should extend a sincere *thank you* to Susanne and to DePaul University for being such thought leaders in our industry.

This is my last issue as editor in chief of *Real Estate Issues*; a job that could not have been accomplished or enjoyed as much without the very capable assistance provided by other Counselors and members of our organization's staff. In particular, I must thank Peter Burley, this year's associate editor, who will succeed me as the next editor in chief. Peter provides a reliable, steady and consistent support of the publication on an almost daily basis, and he was always quick to volunteer whenever special articles were required. REI's board is comprised of our industry's best and brightest. Its members' contribution of articles, reviews and strategic direction have elevated REI to a new level. And of course, none of this great work could be realized absent a dedicated staff. Since joining the CRE team last year, Carol Scherf has produced and edited all three issues. These issues have been the largest, most complex and best in the history of REI. My sincere thanks to all. ■

MAURA M. COCHRAN, CRE, SIOR
EDITOR IN CHIEF

To send any article and/or the complete issue of REI electronically, please visit www.cre.org and go to the Real Estate Issues web page.

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Alberti Group, LLC
Ujjval K. Vyas, Ph.D., J.D.
Principal

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Most would probably agree that sustainability is a truly laudable and challenging goal to set for ourselves, and fully worthy of our best efforts. As importantly, our efforts must be guided by serious engagement with the many complexities of realizing this goal. The articles included in this issue of *Real Estate Issues* illustrate the importance of introducing risk into the sustainability equation so that decision-makers can proactively manage it. By recognizing and managing the risks, we can achieve a positive outcome while hopefully minimizing our post-decision regrets.

This issue is designed to be a resource for professionals and stakeholders involved in the decision-making process for the delivery of sustainable buildings: real estate professionals; insurance and surety professionals; risk managers; government representatives; design professionals; contractors and project managers; pension fund managers; lenders and financial institution executives; attorneys; and consultants.

Susanne E. Cannon and Ujjval K. Vyas

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FOCUS ON GREEN BUILDING

Shifting the Sustainability Paradigm: From Advocacy to Good Business

BY UJJVAL K. VYAS, PH.D., J.D., AND SUSANNE E. CANNON, PH.D., CRE

INTRODUCTION

SUSTAINABILITY HAS BECOME THE WATCHWORD for imagining a new utopia where the relationship of the human endeavor with the natural world is properly aligned to the benefit of both. But this, like all utopias, lies in the future. The present is a dichotomous public conversation between those wishing fervently for this utopia and those that ostensibly cling to an outmoded and dangerous way of thinking. It is hard to believe that this has anything to do with the practical and profit-driven world of real estate. And yet, sustainable development, sustainable building, corporate social responsibility, climate change policy, greenhouse gas emission trading, federally mandated reductions in building energy consumption and the ever-present marketing of green are just the tip of the iceberg forcing a new conversation onto those who, build, hold, operate and invest in real estate assets.

REAL ESTATE RESPONSES TO THE GREEN TREND

A Google search for "Green Building" returns more than 20 million hits while a search for "Green Real Estate" returns more than nine million. Virtually every major magazine has featured articles and editorials on sustainable or green buildings in the past two years. Sustainability has become a vibrant cottage industry and a darling in the public's eye. There is even a TV channel ("Planet Green," owned by Discovery Channel) dedicated to promulgating this ethic. What is not at all clear, though, is whether and to what

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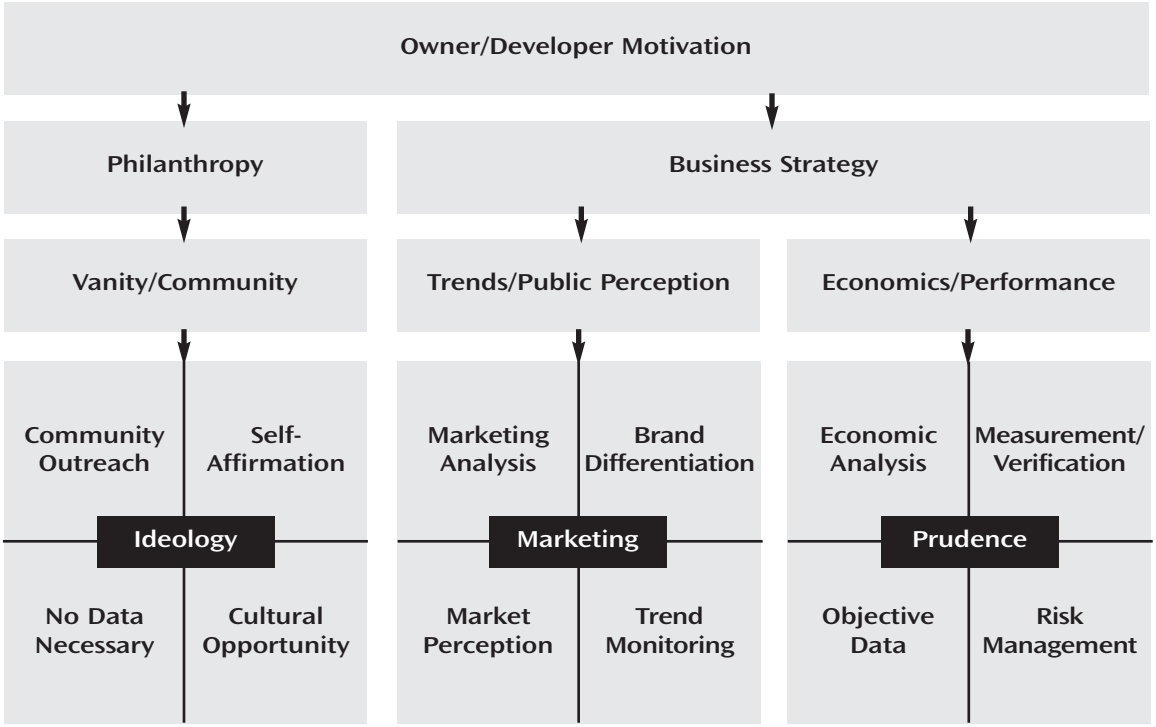
Figure 1

Three Responses to Sustainability



degree this is a fundamental change or a marketing bonanza.

As shown in Figure 1, real estate owners, investors and professionals are responding to this emerging market force in three ways. Although reliable numbers will be hard to find, common sense, plausibility and substantial engagement with this market (unless contradicted by relevant research) serve as the basis for the generalizations that follow. It is important to understand these responses so that we can start to meaningfully evaluate the market for sustainable building assets, both individually and in aggregated forms.

A visible number of real estate companies and other real estate stakeholders have not only embraced sustainability as the model for a new future, they have essentially become converts to the cause. Most often this results from corporate executives' personal consonance with the sustainability agenda. These executives have the power to push through enterprise decision-making guided by something other than the expected risk-adjusted cost benefit analysis coupled with profit maximization and dynamic efficiency.

Development tinged with varying degrees of philanthropy is driven by mission and ideological concerns that are a luxury not afforded nor desired by most real estate professionals answering to shareholders or the bottom line. Often, public sector building activity and ownership mimic this philanthropic tinge since there is little direct fiscal responsibility. Many green or sustainable programs instituted by federal, state and municipal governments lack measurement and verification of outcomes to determine the success of implemented strategies. Without measurement and verification programs, much of the money spent on sustainability options amounts to charity.[1] In a sense, the members of this group have put good business practice aside in order to service an agenda.

A second and more widely adopted response has been to take advantage of public perception through some type of

marketing strategy. In the case of many real estate entities, this has taken the form of a kind of eco-labeling of building assets or services through green building ratings. Whether it is Bank of America's new headquarters in Manhattan, touted as the "world's most environmentally responsible high-rise office building," or 111 South Wacker in Chicago, "the world's first speculative high-rise office building to achieve Gold LEED-CS certification," both offer up sustainability as a core differentiation. The claim is that they are not just Class A office properties, but they are sustainable Class A properties. What is meant by "sustainable," however, is often left to the imagination.

The related stakeholders that are interested in servicing these two types of green real estate ventures are more than happy to respond in any way necessary to the demand for green real estate and building projects of all types. For example, *Engineering News-Record* now provides a yearly breakdown of the top 100 design, construction and engineering firms by dollar value for green construction. Large contractors like Turner Construction, Swinerton Incorporated, all the major architectural firms and even insurance companies such as Fireman's Fund are eager to market themselves as sustainable real estate advocates. This does not even begin to address the many product suppliers and other vendors seeking to hitch their horses to sustainability.

The chief operating and financial officer of a worldwide real estate organization recently said, "[w]e view sustainability as an essential element of corporate social responsibility . . . In our goal to be the real estate industry leader in environmental sustainability and energy management, we are implementing these opportunities into our own operations and those of our corporate and investor clients."[2] In the 1980s Bruce Yandle laid out the often deeply intertwined relationship between social groups, who seek to regulate a market based on deeply held personal beliefs, and market players who have little interest in the beliefs but intense interest in how the passage of the regulation might benefit them or disadvantage their competitors.[3] Becoming a member of a corporate social responsibility reporting rating system is an attempt to differentiate a set of products and services in the market. It should be noted, though, that the actual metrics used in this context are not easily accessed or available for transparent review. It is not a coincidence that both the social groups and the market players spend a large amount of influence and monies trying to create regulatory schemes that will provide ideologically correct outcomes or financial benefits from rent-seeking activities.

If all public buildings in a particular city are required to have green building rating product certification and all requests for qualifications insist on previous experience with building projects that have attained certification, a perverse policy outcome results. Instead of increasing competition among the bidders to provide a better return for public fund expenditures, the number of bidders may in fact be reduced significantly.

Or take the creation of expedited permitting policies, based on obtaining the same kind of green building rating product certification, that can be found in a number of cities including Chicago and San Francisco. An attribute of this policy is the creation of a green unit in the city planning or development office, staffed by individuals who provide the expedited permitting and plan review at minimal or no cost to the developer choosing to "go green." Since no measurement and verification are necessary, the developer's decision to pursue sustainability is reduced to a simple cost-benefit analysis involving the carrying cost of the project and the (comparatively) small additional upfront cost of getting an eco-label for the building. Because there is often little or no correlation between the eco-label and the most important sustainable attribute, energy consumption, the developer is simply reducing his carrying costs by paying for a third-party rating scheme mandated by the city.

This is good for the city as publicity and political good will; it is good for the owner, who gains a bottom line advantage for the project; and it is very good for the third party being paid for the certification as a result of this legislated revenue stream. However, the building may not perform better and thus any benefit to the populace at large is forgone. From a business standpoint, this group is reaping some financial benefit but they are missing the opportunity to profit—in the best sense—from sustainability by going beyond marketing.

The third response to the green conversation finds many in the real estate industry looking for actual performance improvements, either in terms of the building itself or in terms of the financial benefits of investing in or acquiring buildings with sustainable characteristics. This group is not made up of converts and is leery of committing to a social agenda (though it should be noted that some of these professionals are hedging their bets by engaging in some green marketing, if convenient). This group under-

stands how sustainability can be taken to its full business potential, but it wants to apply the same due diligence to this strategy that it would to any other. While these owners and developers have had less public visibility, this is by far the largest segment, which means most of the money is still on the sidelines, waiting for adequate information that can back up bottom-line decisions.

SOLVING THE INFORMATION PROBLEM

The significant value in engaging sustainability for the long-term benefits can only be realized by dealing with the core issues of risk and return—issues that need to be decided based on facts, not claims. It is our contention that the sustainability arena suffers not from a lack of information, but from a lack of the *right kind* of information.

First there is a problem of quality. The current information stream has become polluted with advocacy and lobbying rather than useful metrics. When it comes to sustainability, many developers and owners "don't know what they don't know," and the ones who "know what they don't know" aren't sure where to turn for credible information. The series of articles in this special issue attempts to bring to light the scope of the task and the often hidden risks in all phases of the sustainable building enterprise, from new construction to marketing to managing long-term performance.

As many of these essays suggest, sustainability that does not seek outcome-based assessment will have limited long-term value. Transforming the building stock of the U.S. without the context and metrics for determining success or failure is a recipe for disaster or self-delusion. In the same way that real estate was changed by the coming of modern investment strategy, it is our hope that the current energy market and sustainability may cause a salutary sea-change in the measurement of building performance, providing an expanded context for asset valuation.

Many of the studies to date are not methodologically sound and/or the data pools are too small. In addition, there has been a cascade effect as major players have jumped into the game in an effort to "keep up with the Joneses."

"An availability cascade is a self-reinforcing process of collective belief formation by which an expressed perception triggers a chain reaction that gives the perception increased plausibility through its rising availability in public discourse. The driving mechanism involves a combination of informational and reputational motives: Individuals endorse the perception partly by learning from apparent beliefs of others and partly by distorting their public responses in the interest of maintaining social appearance. Availability entrepreneurs—activists who manipulate the content of public discourse—strive to trigger availability cascades likely to advance their agendas. Their availability campaigns may yield social benefits but they sometimes bring harm, which suggests a need for safeguards."[4]

In order to move past this cascade effect, it is important to maintain a certain degree of skepticism and to acquire information not primarily produced by availability entrepreneurs.

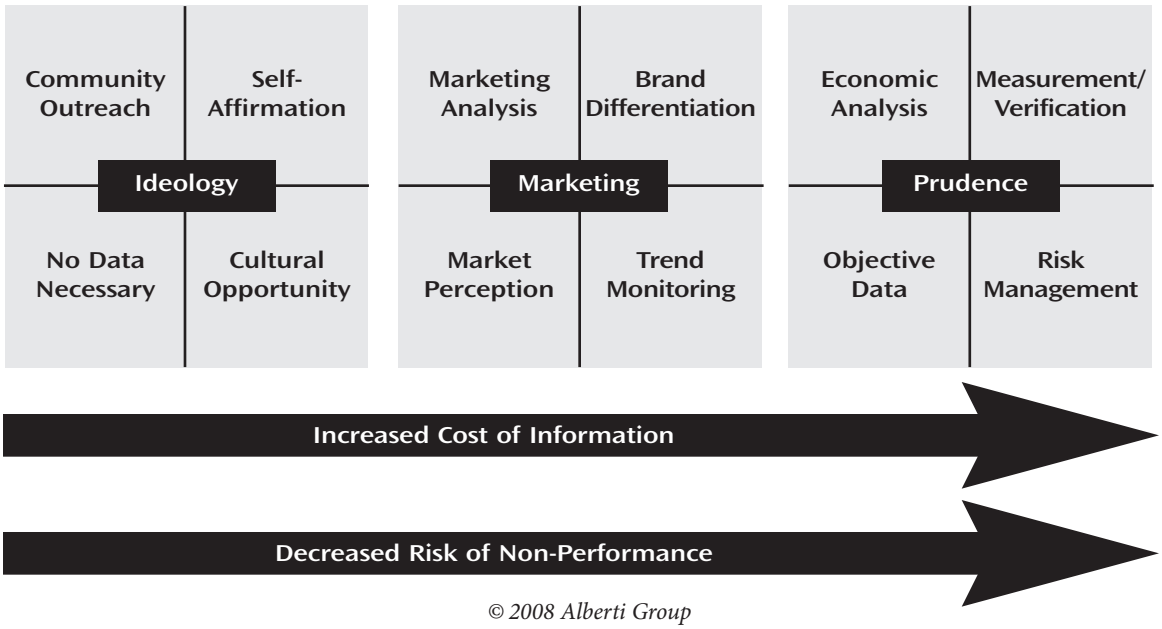
It is clear that studies are needed that can survive close scrutiny and then become the basis for good decision-making: economic studies to make sense of the morass of anecdotal, intentionally and unintentionally skewed claims; technical studies in building sciences, building information systems, epidemiology, toxicology and productivity to help prove out the actual performance of buildings; and risk management studies to determine the contractual, regulatory and risk transfer mechanisms that must be in place to assure an appropriate level of manageable risk. As an example, the following sidebar examines the types of data and methodology that could apply to valuation of green commercial buildings.

The second part of the information problem is cost. Given the complex, intersecting nature of the many different types of expertise required to assess sustainability initiatives or options, the transaction costs alone function as a significant hurdle for decision-makers requiring objective, credible information. At the moment, the cost of acquiring the quality information is high. Because of this, and because it is easier to see some marketing return in the short term, most analyses stop far short of the kind normally expected for business decisions with longer time horizons. The political or public goodwill that can be generated is adequate return for most players. This kind of return will diminish quickly as all players in the market claim to be sustainable. The sometimes deceptive attraction of green building rating system products is linked to their capacity to decrease initial information costs.

In time, the cost of quality information should decrease and the nature of the advocacy market will become more obvious if building performance becomes the touchstone. The current asymmetry of information will decrease as

Figure 2

Due Diligence vs. Risk



the market grows and as owners begin to demand more to properly realize the benefits of performance-based outcomes. This is a common path that businesses have to take when wrestling with technology or process adoption. At what point it becomes effective, in business terms, to come onto the adoption curve, will depend on many things and each business must look to the context in which it operates to make informed choices.

It is important to remember that the increased cost of information is worth incurring as a risk-minimizing strategy. In a polluted marketplace, the premium for more serious due diligence is a hedge against both the potential for building inventory non-performance and a collapse of the marketing bonanza (see Figure 2). The core value of sustainability remains aligned with the core competencies of successful businesses and a temporary distortion, either up or down, should be seen as an anomaly in a long-term position. Someday, hopefully before utopia, sustainability will become business as usual, but until then it is best to ask hard questions, demand credible information, and seek measurable results. "Good business" is the best way to achieve good outcomes. ■

An Example of the Solution: Minimal Protocols for Valuation of Green Commercial Buildings

The decision to purchase or lease commercial office space characterized as "green" for one's employees or tenants' use comes either from a belief that there is a moral imperative to consume fewer resources and to provide a healthier workspace, or from a belief that the market will reward you for making that decision, or from a belief that expenses to operate the building or your business will be lower.

In a simple model, where value is calculated as a perpetuity—the capitalized difference between income and expense—many have posited that if tenants are willing to pay more rent to occupy space with a "green" designation, or if expenses are actually lower to operate the asset, value should increase.

One method of discerning the impact of the combination of personal choice, marketing effort and actual changes in resource consumption on market value or rent is to develop a hedonic pricing model that permits us to identify the factors affecting the value of the property and to determine the weights on those inputs. Hedonic pricing models are based on the assumption that consumers have utility functions that value certain attributes of properties. By gathering data on a large number of transactions and properly identifying the attributes that give the perceived value, we can effectively create weights for the attributes. That is, how much is value a function of physical characteristics (including method of construction, materials, age or other factors); how much is it a function of location (sometimes proxied as distance from the central business district, but probably best done by identifying its submarket); how much is dependent on environmental aspects of the location (including air quality and aesthetics, for example); and finally, how much is related to the building achieving a "green" designation.

Getting to the weights requires gathering large numbers of transactions and conducting linear regression analysis, with the result that value, or rent, is a formula that in simplified form might look like this:

Sales Price or Rent= b1(location variable) + b2(physical variable) + b3(environmental variable) + b4(green variable)

There are a number of issues involved in doing the work properly. First, it is possible to over-or under-specify the model by putting too many or too few factors into the list of possibilities that create perceived value. One way to manage this problem is to try to use relatively homogenous properties in the model so that we focus on the key differences. That is, in studying the impact of school district reputation or air quality on house value, we might try to compare properties in very similar neighborhoods in terms of their physical attributes and location so that the resulting equation has only a few, very important, separate variables. Without these important variables the results will not be valid. There is a long history of hedonic pricing models in the housing literature, suggesting that view, proximity to transportation, quality of construction, and neighborhood characteristics affect value.

Office rent is likely to be dependent on location (characterized by its leasing submarket, which probably captures accessibility and a number of factors that are somewhat comparable to the socio-economic variables used in housing research), age and condition of structure, vertical location within the building, and its design aesthetic and building efficiency. If designating a building "green" has an impact, we should be able to determine that by including it in the analysis and letting the regression model calculate its weight.

We rely on good data, measured objectively, to do the pricing model. Unfortunately, office market data and pricing are very difficult to find. The relatively few early efforts to determine the value of designating a building green have run up against this problem. Several researchers have used the CoStar database,

with mixed results. The basic problem is that CoStar is a product designed to facilitate transactions; it was not designed as an academic research tool. Brokerage firms and property owners voluntarily provide data; CoStar compiles the data and makes it available by subscription. It is a tremendous resource for brokers and for vendors, and it provides very useful variable information for the right-hand side of our simplified equation. For example, location, age and other physical attributes are all tracked. However, since it relies on owners and brokers to self-identify attributes, it is vulnerable to error on whether buildings are properly characterized on dimensions of quality and whether it is "green." In a recent test of the quality of the data, we looked at the California office market and discovered that only a handful of recently built properties were classified as having LEED or ENERGY STAR® status, but after extensive follow-up we identified a much larger list. In order to make the hedonic pricing model an unbiased estimate, we need to work with accurate data.

Further, the left-hand side of our equation, or dependent values, are missing or masked. For example, the actual lease terms are not divulged. Instead, brokers report "asking rents" or what they publish or currently tell first-time contacts. It is quite common for owners or their representatives to have a second tier "asking rent" that they use as a discussion point for broker-to-broker conversation early in the negotiation process. It is not uncommon for owners to require a confidentiality agreement before they proceed to more serious negotiation. And once brokers settle on the final terms for their clients, they do not report them, nor do they report the effective rent after allowing for concessions, build out and commissions. If it were the case that owners consistently reported their asking rents, we might be able to use the data anyway. However, we have conducted interviews with experienced brokers who have revealed that in their experience, different owners have different leasing strategies. Some owners have a pattern of publishing a high price so that they can negotiate a significantly different price with their tenants. Others like to keep the asking rent quite close to the eventual cash rent and to negotiate mostly on other terms, such as the amount of free rent and the tenant finish allowances. The result of the broad differences between owners and their strategies means that we need to find an alternative data source that permits the calculation of net effective rent.

We want to believe that going "green" has an impact on property value. A great many people are making the bet that it will. However, until we resolve the data issues and find a reliable source of pricing data for the left-hand side of our model and a verified list of properties that are properly classified for the right-hand side, we are forced to rely on anecdotes and conjecture. ■

ENDNOTES

1. There is a great deal of work on the mismatch between government policy instruments and the structure of implementing positive environmental change and outcomes. For just a first introduction to some of the issues see, Sanjeev Gupta, Kenneth Miranda, and Ian Parry, "Public Expenditure Policy and the Environment: A Review and Synthesis," *World Development* 23, 515-528, (1995) and Adam B. Jaffe, Richard G. Newell and Robert N. Stavins, "Environmental Policy and Technological Change," *Environmental and Resource Economics* 22, 41-69 (2002). I reference the latter since the diffusion of technological changes is often seen as vital to sustainability issues. Of course, cost-benefit analysis (CBA) was begun as a way to deal with the lack of metrics in public policy and the problem of spending monies from the public trust with no accountability. For a detailed review of CBA's successes and appropriateness for use see, Matthew D. Adler and Eric A. Posner, eds., "Cost-Benefit Analysis: Legal, Economic and Philosophical Perspectives," (Univ. of Chicago, 2001).
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FOCUS ON GREEN BUILDING

Weather-Related Losses in the Built Environment: Societal Change and Climate Change

BY ROGER PIELKE, JR.

INTRODUCTION

IT IS NOW COMMON IN POLICY DEBATES to invoke human-caused climate change as a possible cause of economic, public health and catastrophic property losses. A close look at climate change issues and the built environment, including both the larger scale planning issues and the actual set of current and future building assets, shows some interesting and perhaps surprising results. This discussion revolves around the simple question: what are the primary mechanisms by which we can mitigate, adapt to or possibly prevent global losses associated with the built environment? Our research on the possible links between climate change, as it affects hurricane frequency and intensity, and the economic damages of landfalling storms suggests that the debate over the effects of greenhouse gas emissions and storm behavior may be largely irrelevant to governments and insurance companies that bear the losses.

DISASTERS AND CLIMATE CHANGE

Every time a disaster occurs, it isn't long before someone raises the specter of human-caused climate change and its possible role in the event. Some of the more enthusiastic participants in the public debate over climate change have no qualms about linking every extreme event to climate change, sometimes with qualifications, but sometimes not. Others, especially those wanting to go slow on taking action, emphasize that policies require solid cost/benefit analyses buttressed by a full acknowledgement of the uncertainties present in the scientific, economic and technical issues.

A wide range of data sets and analyses from around the world paints a consistent picture: direct economic losses (adjusted for inflation only) have been on the rise in recent decades around the world (Figure 1). Disaster losses have not increased in every region at a constant rate. Some regions, like Australia, have seen decreasing trends.

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Roger A. Pielke, Jr., *a faculty member of the University of Colorado since 2001, is a professor in its Environmental Studies Program, focusing on research at the intersection of science and technology and decision-making. Pielke is a Fellow of the Cooperative Institute for Research in Environmental Sciences (CIRES), where he served as the director of the Center for Science and Technology Policy Research from 2001–2007. In 2006, he received the Eduard Brückner Prize in Munich, Germany, for outstanding achievement in interdisciplinary climate research. Previously, Pielke was a scientist at the National Center for Atmospheric Research. He is also author, co-author or co-editor of five books, his most recent entitled* The Honest Broker: Making Sense of Science in Policy and Politics, *published by Cambridge University Press in 2007.*

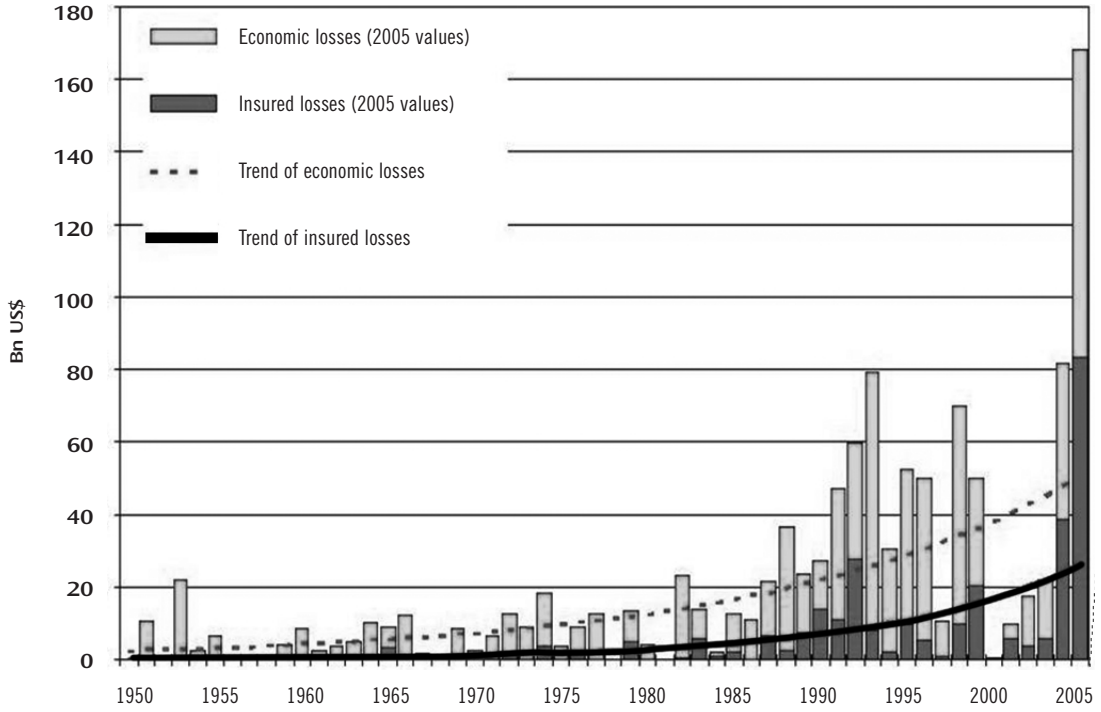
Since the 1980s there has been a particularly large increase in the frequency and magnitude of disasters. The trend in the global numbers of great natural catastrophes since 1950 shows a steep increase in the largest weather-related disasters—from one event in the 1950s to five in recent decades, while geophysical disasters (earthquakes, tsunamis, volcano eruptions) have increased from one to less than two in the same time.[1] Weather-related disasters are therefore the major contributor to increasing losses due to natural disasters.

Climate change and variability are important factors that shape patterns and magnitudes of disaster losses. For example, even after adjusting for changes in inflation, wealth and population in the 1970s and 1980s, the United States experienced approximately $41 billion and $36 billion in hurricane losses, respectively. By contrast, the 1990s and 2000s (through 2005) saw $87 billion and $167 billion (updated data from *Pielke and Landsea* 1998[2]). The 1970s and 1980s were characterized by below-average hurricane activity and storm landfalls, whereas the period since 1995 has seen very active seasons and correspondingly more landfalls, particularly in 2004 and 2005, and now 2008. Similarly in Australia, 13 tropical cyclones made landfall along its east coast from 1966–1975, whereas seven made landfall from 1996–2005.[3] Similar results have been found for floods and other weather events in different regions around the world.

Attribution of a trend to anthropogenic climate change is difficult, according to the Intergovernmental Panel on Climate Change (IPCC). Insufficient record lengths are sometimes the case with respect to climate events, consequently excluding long-term natural variability as causes of observed trends. Other problems arise from inhomogeneous data sets. For instance, hurricane wind speeds were measured by empirical observation of wave characteristics from ships, by using pressure-wind relationships, by measuring velocities of airborne sondes dropped from aircrafts or by Doppler radar techniques. Changing river

Figure 1

Global Disaster Losses, 1950–2005



discharges over time might depend on changing land use patterns or changing hydrodynamic characteristics of rivers brought about by hydro-engineering construction work. Since Intergovernmental Panel on Climate Change (IPCC) 2001, additional research results have been published on the changing nature of extremes, and the IPCC reported again on this subject in 2007.

THE ROLE OF SOCIETAL CHANGE IN DISASTER LOSSES

Regardless of what is found with respect to trends in weather extremes, *societal change and economic development* are the principal factors responsible for the documented increasing losses to date. This cannot be stressed enough. *What we build, how we build and where we build are the most important factors in shaping the losses—economic and otherwise—associated with future disasters.* Such results have been found looking at disasters globally and in specific regions and for specific phenomena, such U.S. tornados, hurricanes and floods; Australian weather-related hazards; floods in the United Kingdom; Indian tropical cyclones; Chinese floods and storms; Latin American floods and storms and Caribbean hurricanes.[4]

Societal changes that lead to increasing losses include population growth in exposed locations, increasing wealth at risk to loss, and policies that lead to increased vulnerabilities. Changes in various societal factors vary according to context. For instance, China's economy has grown as fast as 8.5 percent annually, and regions such as Florida in the U.S. have seen population growth at a rate far greater than the U.S. national average.

Figure 2 shows population growth in Miami-Dade County, Florida, from 1900–2000, as well as the number and intensity of storms during the same period. Since 1970, Miami has experienced only one major (Category 3 storm), a rate of one every 38 years, but before 1970, it experienced 10 during a 70-year period, or a rate of one every seven years. In the simplest terms, the property value vulnerable to loss has grown considerably in the last 75 years.

Miami in 1930 is a far cry from Miami today. Given this change in land use and population increase, it is not at all surprising that hurricanes that hit Miami now cause losses that are greater in magnitude.

The illustration of Miami-Dade County is representative of a broader national pattern. Losses during the 1970s through the early 2000s, even with hurricanes Hugo (1989) and Andrew (1992), were far less than those that would have been experienced earlier in the 20th century, considering contemporary levels of development. This suggests that regardless of the nature of changes in the climatology of hurricanes, continued development and accumulation of wealth in vulnerable locations will inevitably lead to greater losses, particularly if storm frequencies exceed those of the less active period of the 1970s–1990s.

Figure 3 shows clearly that land development and societal changes in demographics will be a far more potent contributor to insurance losses than climate change.[5]

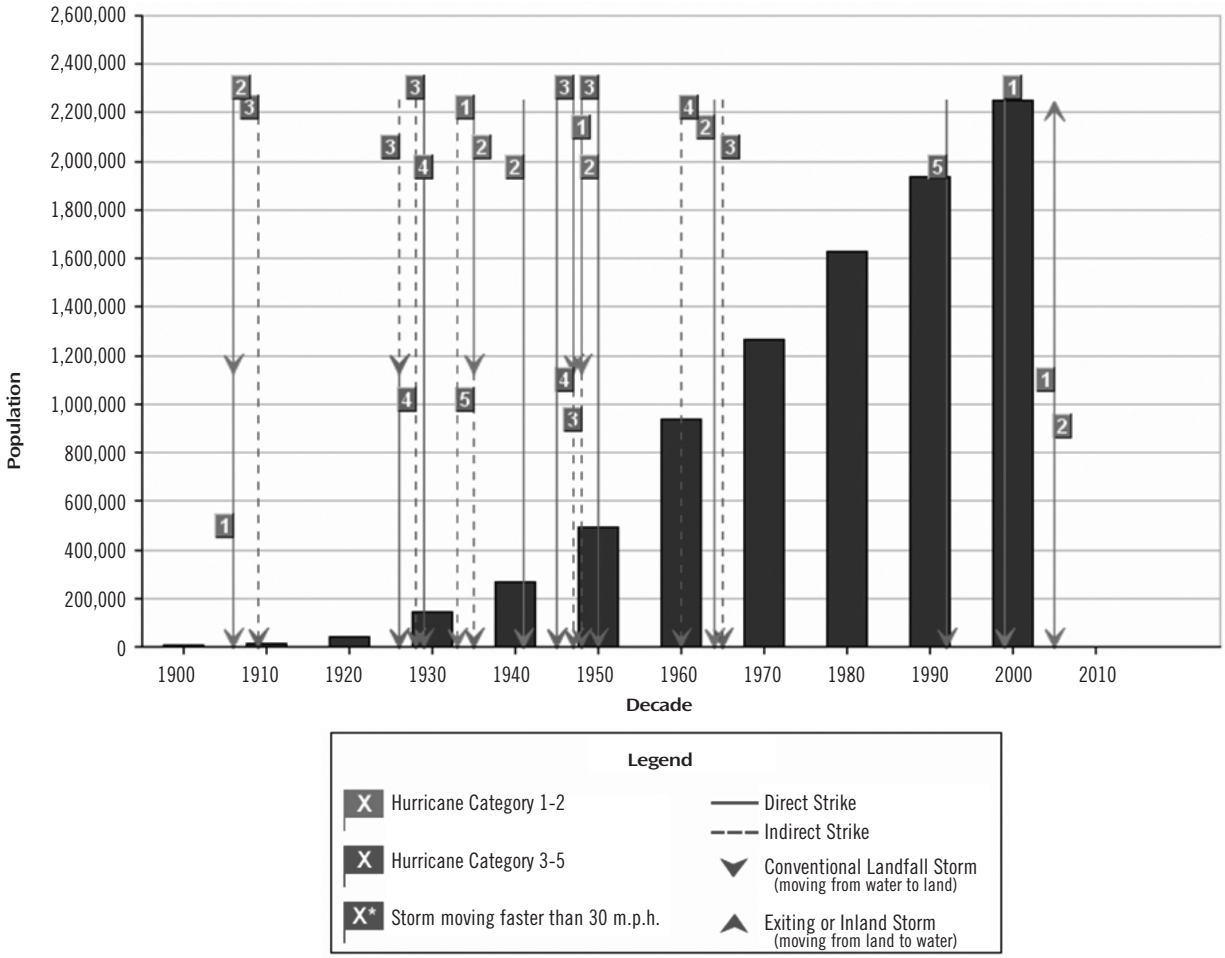
The impact of extreme weather events varies between the developing and the developed world. While the developed world sees the highest absolute direct economic losses from weather extremes, the largest numbers of casualties and people affected occur in poorer communities. Unsustainable exploitation of natural resources in many regions in the world may exacerbate the impact of natural disasters (for instance, deforestation may increase the frequency and intensity of floods). The relative role of disaster mitigation activities in addressing disaster losses remains poorly documented and understood. Recent studies comparing relevant cost-benefit analyses conclude, in spite of the methodological challenges, that the benefit-to-cost ratio of investments in disaster mitigation are about 2–4.[6]

Because of issues related to data quality (the stochastic nature of extreme event impacts, length of time series, and various societal factors present in the disaster loss record), it is still not possible to determine the portion of the increase in damages that might be attributed to climate change due to greenhouse gas emissions. Long-time series disaster loss data for some regions are either unavailable or of poor quality for various phenomena, particularly before the 1980s (e.g., for China) and the 1970s (Australia, Canada, Caribbean, Central America, China, Europe, India, Japan, Korea, and U.S.). The historical loss record is strongly influenced by a small number of large events such as Hurricane Katrina, which accounted for about 50 percent of global storm and flood losses in 2005. Thus, there is a strong element of chance in short-term records.

The quantitative attribution of trends in storm and flood losses due to greenhouse gas emissions is unlikely to be answered unequivocally in the near future because the problems described above are expected to persist. As a consequence, we urge decision-makers not to expect

Figure 2

Hurricane Strikes vs. Population for Miami-Dade County, Florida



Hurricane Strike Data: National Hurricane Center

Population Data: U.S. Census Bureau

***NOTE**: There may be discrepancies between the strike data shown in this chart and the HURDAT strike data used in the Historical Hurricanes Tracks Tool.*

The National Hurricane Center is currently updating the strike data used for these charts.

For more information visit http://www.aomi.nosa.gov/hrd/data_sub/re_anal.html.

***NOTE**: Population data is current as of 2000 U.S. Census. X-axis on graphs depict years through 2010 to illustrate storms that have occurred from 2000-2006.*

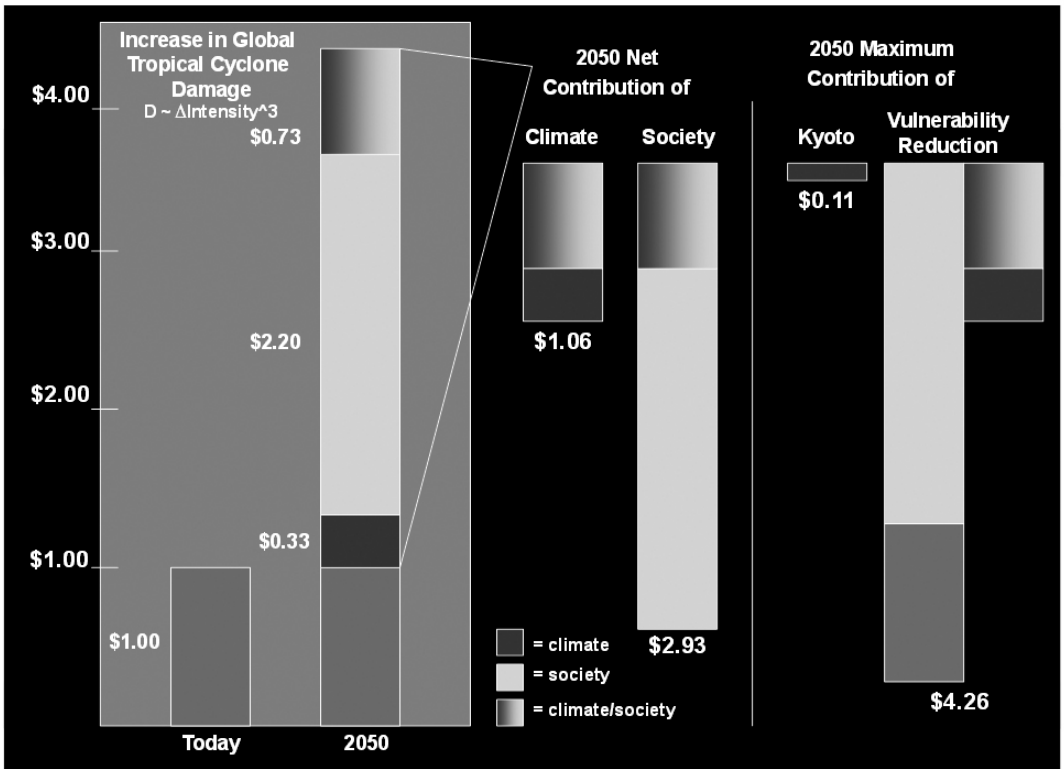
Source: National Oceanic and Atmospheric Administration

definitive answers to questions about the linkage of growing disaster losses and anthropogenic climate change, as this will remain an important area of study for years to come. Such uncertainty need not preclude proactive decision-making. Adaptation to extreme weather events should play a central role in reducing societal vulnerabilities to climate and climate change. There are three main reasons for this conclusion:

1. Adaptation to climate variability and extremes has always been necessary, and future adaptation can be most effectively designed if it continues and builds upon experience. Declining global and U.S. trends over the long term in mortality and morbidity (or injury) rates due to various extreme weather events suggest that adaptation might successfully aid

Figure 3

Future Damages Attributable to Climate and Societal Choices Until 2050



Source: Pielke (2007)

in containing economic losses. Mitigation of greenhouse gas emissions will take a substantial amount of time to become effective, and in the meantime, adaptation will become increasingly necessary. The nature of a policy response to climate change will differ in adaptation as opposed to arresting or reversing this change. Therefore, more and more pressure may be brought to bear on the regulation of real estate development to further the goals of climate change mitigation;

2. There is a current adaptation deficit, and practices of maladaptation and unsustainable development are serving to increase vulnerability in many places. In particular, the insufficient pricing of adaptation and its benefits in terms of goods and services preserved in the face of changes and extreme losses leads to inappropriate valuation of risk-reducing measures in investment and financial calculations at both the public and private sector levels, particularly in developing countries;

3. In all socio-economic sectors, as effects of climate variability and extremes occur, adaptation policies and measures are used to help reduce exposure and effects. Climate change, regardless of cause, may require a broader perspective in adaptive capacity than has been the case in the past. Generally these activities are in the domain of specialized professionals such as agronomists for agriculture, engineers and hydro-meteorologists for water management, irrigation, flood control, etc.; structural and design engineers for infrastructure, buildings, etc.; and public health officials for infectious and vector-borne diseases. The work of these professionals is not explicitly referred to as adaptation, but may be described as plant breeding and

selection, flood control or flood damage reduction, and so forth. The current practices of adaptation are not sufficient to prevent the growth of losses resulting from climate change, variability and extremes.

Decision-making processes that are dependent upon unequivocal quantitative linkages between disaster losses and anthropogenic climate change should be reconsidered in the context of this continuing uncertainty. Decision-makers might embrace more fully an alternative approach to decision-making, e.g., one based on no-regrets vulnerability reduction or proactive risk management.

Mitigation of greenhouse gas emissions also should play a central role in response to anthropogenic climate change, though it cannot decrease the hazard risk for several (or more) decades. Carbon dioxide contributes most to the anthropogenic greenhouse effect and is primarily released by burning fossil fuels like coal, oil or natural gas.[7] Once released into the atmosphere, carbon dioxide has an average residence time in the atmosphere of up to 200 years. This means that emission reductions of carbon dioxide cannot reduce its concentration in the short term and therefore cannot result in immediate changes to the climate system. Emission reductions, however, influence the future levels of carbon dioxide in the atmosphere and thus the further increase in global temperatures and the potential for more frequent and intense extreme events. Emission reductions are likely to reduce the risk of abrupt climate changes and climate processes that could become irreversible.

STRATEGIES AFFECTING REAL ESTATE

The major factors underlying increasing disaster losses are already apparent. Further research in this area will be useful, but it will not change the conclusion that effective policies must focus on both adaptation as well as mitigation. Real estate adaptation strategies to reduce losses and decrease vulnerability involve two types of options. One includes increased costs related to acceptance of more disaster-sensitive building codes (which would be passed on to the consumer) or pricing property insurance premiums to fully account for the increased risks on coastal developments that do not provide for disaster-resistant building techniques. Other options, perhaps more politically challenging to implement, include regulation of real estate to prevent new projects in vulnerable areas or creating taxing schemes to force the construction of disaste-resistant developments. The latter option would simply mean less development in vulnerable but economically (and often aesthetically) valuable locations.

Our work shows that once losses are properly normalized, the general consensus is that increased property losses are not predominantly the result of climate change but societal changes. Thus, if the task is to reduce these losses, the best short-term strategy is one of adaptation combined with an eye toward mitigation in the long term. ■

ENDNOTES

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3. Crompton, R.P. 2005. "Indexing the Insurance Council of Australia Natural Disaster Event List." Report prepared for the Insurance Council of Australia, Risk Frontiers.

4. These are documented in our report: *http://sciencepolicy.colorado.edu/sparc/research/projects/extreme_events/munich_workshop/workshop_report.html.*

5. For a more detailed explanation of the data sets and assumptions, please see Pielke, Jr., R. A., 2007. "Future Economic Damage from Tropical Cyclones: Sensitivities to Societal and Climate Changes," *Philosophical Transactions of the Royal Society*, Vol. 365, No. 1860, pp. 1-13, and Pielke, Jr., R. A. (with contributions from P. Hoeppe and S. McIntyre), 2008. "Case Studies in Disaster Losses and Climate Change," pp. 131-140 in the "Proceedings of the 15th 'Aha Huliko'a Winter Workshop on Extreme Events," University of Hawaii, Honolulu, January 2007.

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7. Other relevant greenhouse gases include methane, nitrous oxide, chlorofluorocarbons and water vapor.

FOCUS ON GREEN BUILDING

Selling and Governing the Green Project: Owner Risks in Marketing, Entitlement and Project Governance

BY PAUL D'ARELLI, ESQ.

INTRODUCTION

CRITICAL THINKING ABOUT THE LEGAL AND RISK MANAGEMENT issues related to green buildings is in its relative infancy. With the sustainable development revolution upon us and a general consensus that it is here to stay, attorneys for owners, architects, contractors, lenders and the like are beginning to identify how designing, building, certifying and marketing green buildings could subject the various project participants to liability as well as how to protect their clients accordingly. There are an astounding number of players in the sustainability arena sporting green blinders and operating under the premise that green buildings are better buildings, therefore eliminating or reducing the risks in designing, constructing and delivering certified green buildings to the marketplace. Those of us currently counseling clients undertaking green building projects and pursuing third-party certification find such a premise not only untrue but also irresponsible. When you combine new building systems and technologies, inexperienced players throughout the development chain, and the relentless pursuit of a third-party green building certification with exploitation of its attendant marketing benefits, the result is a perfect recipe for potential legal exposure.

While the first generation of certified green buildings has been around for several years, industry groups are only now working on model green building lease language, tooling green design and construction contract provisions, and beginning to identify the insurance risks, coverage implications and possible new products. Why the delay in focusing on legal and risk management issues? After having the opportunity to meet many participants in the delivery of green buildings over the past few years, I have concluded that many developers, designers and contractors bold enough to embrace sustainable development and pursue third-party certification before it was chic, did not know if green building was a fad or if it was here to stay. Without knowing the longevity of the movement and not truly appreciating or understanding

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Paul D'Arelli, Esq., *is a shareholder with the international law firm Greenberg Traurig, P.A. He was the fifth attorney in the U.S. and the first in Florida to become a LEED® Accredited Professional by the U.S. Green Building Council. D'Arelli also is co-chair of Greenberg Traurig's Green Building & Sustainability Group. He serves as counsel on two major mixed-use LEED for Neighborhood Development Pilot Projects, and has advised clients on a variety of other green building projects and matters. D'Arelli holds an LL.M. from the University of Miami School of Law in Real Property Development and is a licensed California general contractor. He lectures and writes frequently on sustainable development risk management issues.*

areas of potential exposure, there was little investment made or attention paid to risk management issues such as reworking design and construction contracts, scrutinizing the sufficiency of standard professional liability and property insurance, or implementing marketing and leasing protocols to minimize unreasonable expectations of certification and performance outcomes.

From entitlement, design, construction and consulting to incentives, leasing, marketing and insurance, the delivery to market of a building that is striving for LEED®[1] or some other third-party certification poses a host of legal and risk issues that require deliberate and thoughtful management. Nonetheless, attention to legal and risk management issues for buildings or developments seeking certification under green rating systems significantly lags behind the uptake and utilization of green building rating systems. This author believes that important areas for sound risk management in the delivery of a green building or development must be the marketing and entitlement statements and the project governance.

RISK MANAGEMENT ISSUES FOR CONSIDERATION:

Marketing the Green Project

One of the areas rife with legal exposure is the marketing of green buildings. The genesis of the risk comes from enthusiastic owners and zealous marketing in combination with leasing professionals who are proud and eager to tout the sustainable aspects of the project; the time lag between commencing a green building project and the actual receipt of the certification; a general lack of knowledge or unwillingness to acknowledge or appreciate that all green buildings are not meeting certification or performance expectations; and finally, mismatched incentives for owners, marketers and leasing brokers. When the marketing claims discussed below regarding the certification of the project or the building performance are untrue at the inception or prove to be inaccurate, a tenant, purchaser or other third party with unmet expectations (or the desire to get out of a contract for an unrelated purpose altogether) could allege misrepresentation, fraud in the inducement or breach of contract.

Certification Statements

Let's assume an owner/developer is proposing to build an office building and it is the owner's objective to obtain a LEED Gold certification under the LEED for Core & Shell Green Building Rating System™. Procedurally, the project is registered with the U.S. Green Building Council (USGBC) early in the design process. However, it is not until construction of the building is completed that all final LEED letter templates and documentation are submitted to the USGBC to begin the final certification process. Note that under the LEED Core & Shell program, it is possible to obtain "Precertification" based on an early design document review that is intended to essentially allow the owner (and third parties such as tenants and lenders) to expect that if the building is constructed as designed, it is likely to receive certification. Based on current estimates, it can take from several months to a year after the building is completed and final project documentation is submitted for a final disposition of the rating. It is only upon completion of that final USGBC review and certification decision and exhaustion of any appeal, if applicable, that our hypothetical owner will know if the project obtained the LEED Gold certification. In light of this lag, marketing of the project from its inception until the certification determination is made can be problematic.

It is not uncommon, for example, after merely registering a project with the USGBC in pursuit of certification, for an owner to make statements early on in advertising, project signage and other marketing materials that the building "is LEED Gold," "will be LEED Gold" or "will be the first LEED Gold office building in X Town." The design and construction of an office building involves multiple parties—architects, engineers, contractors, subcontractors, and vendors—who all have the ability to compromise the owner's certification objectives. Combine this with the fact that the ultimate rating decision is made by an independent, non-profit, non-governmental organization which often doesn't confer the level of certification being sought by the owner, and it becomes clearer why it is imprudent to make assertions that the project "is" or "will be" certified or certified at any particular level. Furthermore, just because a building may be the first in a particular jurisdiction to be registered with the USGBC is no assurance that another building will not be registered and actually complete certification first. In fact, the number of buildings registered far outstrips the number actually certified. If a tenant or purchaser ascribes substantial value to a particular building being first in some market based on an owner/developer's marketing claims and this ends up not being the case, the owner/developer could face substantive difficulties. Last, it is important to realize that many in the corporate/tenant community do not clearly understand the difference between "Precertification," "Certification,"

"Registered," "Certifiable," or other locutions devised by marketing departments or currently part of the green building vocabulary. Therefore, developers should take extra care not to promote their building as being certified, or assured of certification, and should be particularly careful about these representations if a prospective tenant or purchaser is drawn to "green" as a differentiating advantage.

Now consider that the risk of promoting but not achieving the rating sought is compounded for a project seeking certification under the proposed LEED for Neighborhood Development (LEED-ND) rating program, and why extra vigilance will be merited in marketing the project. According to the USGBC, LEED-ND is a rating system that integrates the principles of smart growth, new urbanism and green building into the first national standard for neighborhood design. It is being developed by the USGBC in partnership with the Congress for the New Urbanism and the Natural Resources Defense Council. Whereas other LEED rating programs focus primarily on green building practices, LEED for Neighborhood Development looks not only at the buildings but also the location of the project and its site design, and draws largely on new urbanist planning principles such as high-density mixed-use, connectivity and reduced reliance on the automobile. Certified green buildings are not required; however, points are available within the LEED-ND rating system for including LEED-certified buildings and for integrating green building practices within the buildings on the project site. These credits relate to energy efficiency, reduced water use, building reuse, recycled materials, and heat island reduction.

LEED for Neighborhood Development is currently being tested as a pilot program that includes 238 projects in 39 states and six countries. The pilot projects are in the process of gathering documentation based on the rating system, which will be submitted to the USGBC with the goal of becoming certified. After feedback and refinement, the resulting draft rating system will be posted for public comment before it is submitted for final approvals and balloting. It is expected to be released to the public in 2009.

There are three stages in the certification process for LEED-ND: 1) Optional Pre-Review; 2) Certification of an Approved Plan; and 3) Certification of a Completed Neighborhood Development.

- **Stage 1** – Optional Pre-Review is available for projects to use at any point before the entitlement process begins. If pre-review approval of the plan is achieved, the USGBC will issue a letter stating that if the project is built as proposed, it will be eligible to achieve LEED for Neighborhood Development certification. The Pre-Review letter is intended to assist the developer in garnering local government support for the project during entitlement, as well as attracting financing and potential occupants.
- **Stage 2** – Certification of an Approved Plan is available after the project has been granted any necessary entitlements. During this step, any changes to the original plan reviewed during the Optional Pre-Review step are reviewed again by the USGBC for their potential effect on prerequisite or credit achievement. If approved, the USGBC will issue a certificate stating that the approved plan is a LEED for Neighborhood Development Certified Plan.
- **Stage 3** – Certification of a Completed Neighborhood Development occurs when construction is complete or nearly complete. The USGBC will review any changes made to the certified approved plan that could potentially affect prerequisite or credit achievement, and if certification requirements are met, the project will be certified as a completed neighborhood development.

By the USGBC's design, LEED–ND was intended for larger, multiple building projects where the master developer is likely to sell off portions of the project to other developers or owners. While there are projects of all sizes and varieties currently in the LEED-ND Pilot Program, many are large, mixed-use projects with multiple buildings that will be built out over several years. Thus, while the owner/developer could obtain USGBC approval of a Certified Plan after the project is entitled, actual certification of the project could be many years away depending on the final build-out of the project. This additional time lag between project inception and the project certification determination provides more time and opportunity for the owner's rating objectives to be compromised. As discussed below regarding project governance, the potential for multiple owners/developers of parcels within the master development also presents a challenge in ensuring that no one owner or developer detrimentally impacts the master developer's LEED-ND rating objectives, and also should merit extra care in marketing statements.

RISK MANAGEMENT ISSUES FOR CONSIDERATION:
Performance Statements

In addition to the tendency or temptation to make speculative statements in marketing materials regarding the project's desired green building certification, some owners/developers make ill-advised claims about green building performance. With indoor air quality and enhanced efficiency and/or lower consumption of energy and water being some of the driving factors in the decision to pursue a green building, promoting these performance objectives is understandable from the landlord's or tenant's perspective. However, too much credence is being given by owners to the "average" efficiencies that are being achieved with LEED-certified buildings as reported by the USGBC and others, or to the anecdotal evidence that is widely circulated in publications, the Internet and at the myriad of conferences on sustainable development. In reality, while the averages may be true, there are a significant number of certified green buildings that are on the low end of the spectrum and not meeting their anticipated performance metrics.

For example, the executive summary of a recent report by the New Buildings Institute, funded by the USGBC and entitled "Energy Performance of LEED® for New Construction Buildings," studied 121 LEED New Construction certified buildings that have been operational for at least one year and which provided actual energy use data, states that:

> "This study analyzes measured energy performance for 121 LEED New Construction (NC) buildings, providing a critical information link between intention and outcome. The results show that projects certified by the USGBC LEED program average substantial energy performance improvement over non-LEED building stock."[2]

This sounds good, but hold the presses on that project marketing brochure. The report also notes later that:

> "Program-wide, energy modeling turns out to be a good predictor of *average* building energy performance for the sample. However, as with the other metrics in the study, there is wide scatter among the individual results that make up the average savings. Some buildings do much better than anticipated . . . . On the other hand, nearly an equal number are doing worse--sometimes much worse." (Emphasis added)
>
> "At the extreme, several buildings use more energy than the predicted code *baseline* modeling . . . . This degree of scatter suggests significant room for improvement in energy use prediction accuracy on an individual project basis." (Emphasis added)
>
> "Variation in results is likely to come from a number of sources, including differences in operational practices and schedules, equipment, construction changes and other issues not anticipated in the energy modeling process."[3]

Because of the tendency of the media and those with vested interests in furthering the noble agenda of green buildings to publicize the efficiencies that are accruing "on average" more vigorously than publicizing performance failures, owners, tenants and others understandably have a perception and expectation that these "average" efficiencies will accrue to them if they commit to a certified green building. These expectations can easily get translated into a well-intentioned owner's marketing material, creating further expectations in tenants and purchasers. For example, statements made in marketing materials such as "this LEED Gold office building will save 28% in energy and 45% in potable water" or "tenants will save money on operating costs and see higher worker productivity and less absenteeism in this LEED Gold office building" are not unheard of. What happens, however, when the publicized performance metrics or green building benefits are not realized? What happens when a tenant or purchaser acquires information during the due diligence process indicating that a study or data used to make these representations is not credible? Or worst of all, what happens if the tenant or purchaser has poor performance outcomes and comes to realize that the representations made by the owner were questionable or less than credible from the beginning? While owners or developers themselves may take recourse against their design and construction team, they may also have disappointed tenants and purchasers whose financial pro forma is distorted or whose reputation is jeopardized when the operational savings or human resource benefits are not realized. Naturally, this creates a potential for claims of breach of contract, misrepresentation and the like, and potential harm to the developer or owner's reputation in the marketplace.

In addition to the increasing challenge of managing risk when promoting the pursuit of certification objectives, managing risk in the marketing of project performance goals may also become more complicated with new rating

systems addressing larger-scale projects like LEED for Neighborhood Development. For example, the targeted efficiencies for energy use, water use, etc., may extend beyond a single building to multiple building, project-wide goals. As discussed in more detail below, certain credits under LEED-ND could require cooperation or compliance by multiple building owners or developers, increasing the potential for non-attainment.

To protect against potential third-party claims when expectations are not met, owners and developers should be careful to not make statements in their marketing materials regarding building performance that could prove untrue and be alleged as a significant inducement to lease or purchase. While "puffery" or exaggeration of a product's benefits is common in sales, it should probably be avoided in the context of green building performance expectations, as many on the receiving end of the statements may not know them to be speculative. It would be wise to train marketing, sales and leasing professionals involved with the project so that they fully understand the certification process and the attendant risks of making untrue statements or statements of desired performance outcomes which the owner may not have adequate control to ensure. Also, given the frequent disconnect between marketing, management and legal departments, developing a company protocol for review and approval of all green building aspects in project marketing materials, press releases, etc., by counsel knowledgeable in these matters could be a sound component of the project risk management strategy.

ENTITLING THE GREEN PROJECT

Everything discussed above in terms of the need to exercise caution when marketing a green building project should also be taken into consideration when entitling the project. Regarding entitlements, many local governments are interested in increasing the amount of green building stock within their jurisdictions; and regardless of whether the jurisdiction has any green building mandate or formal incentive program, "going green" is increasingly being encouraged. As such, owners or their zoning counsel seeking support for a development proposal, may be inclined to make statements or commitments regarding the project's green building objectives in comprehensive planning, zoning, site plan or other development approval applications, in conversations with local government staff or elected officials or at the dais during a public hearing.

As in the sales context, it is not uncommon for land development counsel or other project advocates to passionately extol the many virtues of their projects in an effort to secure project approval. If that is done in the context of green building objectives, an owner could inadvertently find those statements manifested in the form of development approval conditions. As such, obtaining a building permit or a certificate of occupancy could end up being conditioned on the owner's demonstrating that the green building commitment is assured or was met—a risky proposition if that commitment is to obtain a third-party certification. While this may sound remote to some, an acquaintance of this author recently disclosed that he is involved in a project with which the local government made LEED Silver certification a condition of approval for the project's conditional use permit. With this example in mind, it is suggested that all development approval applications and statements made on the public record during project entitlement be carefully tailored so that mere aspirations to pursue third-party green building certification do not to become approval conditions unless the owner is prepared to accept them.

When the USGBC's pilot program for LEED for Neighborhood Development is completed and LEED-ND is rolled out for general use, any such conditions of approval that are tied to a LEED for Neighborhood Development certification could be particularly risky or constraining. Since LEED-ND includes concepts of new urbanism that affect land planning rather than just building design and construction, a commitment to obtain LEED-ND certification could carry significantly greater risk than committing to build a certified green building. For example, in an effort to meet neighborhood certification commitments or requirements, developers could be compelled to pursue credits that affect such things as solar orientation of lots and blocks; inclusion of affordable housing; residential unit type, mix and density requirements; and project access spacing requirements, to name a few. In fact, one LEED-ND prerequisite, "Neighborhood Pattern & Design Prerequisite 1: Open Community," requires that the developer: "Designate all streets and sidewalks that are built as part of the project or serving the project directly as available for general public use and not gated. Gated areas and enclaves are NOT considered available for public use, with the exception of education and healthcare campuses where gates are used for security purposes." As such, even to be eligible to seek certification under LEED-ND as it currently stands in the

pilot version, the developer could not gate the project. While such concepts of new urbanism may be "good planning," developers may find themselves in a very difficult position. This is particularly so since developers seeking land use or zoning entitlements often do not have enough design detail and information to know exactly how such far-reaching commitments will translate in terms of cost or suitability in a particular market. Owners or developers who make or accept the commitment to obtain LEED-ND certification during early stage entitlement should be prepared to accept the design constraints and potential implementation costs associated with these planning schemes.

PROJECT GOVERNANCE

In addition to marketing and entitlements, project governance also should be revisited to accommodate green building issues. Consider, for example, the project governance complexities in the case of a mixed-use building with residential condominiums, hotel and retail that is seeking certification under the LEED for New Construction rating program. The residential condos are proposed to be sold and there will be a condominium association. The hotel will be sold as a commercial condo and will be operated under a national flag with a green lodging initiative pursuant to a hotel management agreement. The retail will be sold as commercial condos and the owner will cater to retail stores and restaurants whose sustainability commitment drives their decision to locate in a LEED-certified building, including one national retailer with a corporate mandate to locate only in LEED Silver certified space. In addition to attaining LEED certification, the commercial condo owners desire that the building continue to be maintained and operated at the same standard that qualified the project for LEED certification in the first place, so that it can be certified in the future under LEED for Existing Buildings. There will be a master association over the entire project.

As a threshold matter, it becomes imperative to understand and anticipate the objectives and expectations of both the developer, and to the extent possible, each of the end users in mixed-use green buildings. In the example noted above, for at least two of the uses (hotel and retail), the proposed LEED certification is an integral component of the business model for product differentiation and a corporate mandate for one of the targeted tenants. With the objectives identified, project governance needs to be put in place to ensure that the objectives are likely to be met over both the short and long terms. A mere sampling of issues to consider includes:

- How will the green building objectives (certification, performance, maintenance, etc.) be defined and translated into all appropriate project documentation (e.g., condo documents, property owner association documents, CC&Rs, etc.)?
- How does the master developer ensure that each of the owners and end users will cooperate in any requirements necessary to obtain the desired LEED certification?
- How will controls be established (e.g., integrating LEED or other consulting into the architectural review committee process) so no owner, tenant or association can make physical alterations that could compromise the project rating or performance objectives?
- If there are multiple associations, what controls will be put in place to ensure no association could take action to impair the future project certification or performance objectives by amending the association documents?
- How will operational requirements such as green cleaning, green pest control, recycling, etc., be imposed and enforced project-wide?
- How do the project documents provide sufficient assurance to the end users regarding maintaining the integrity of the green building objectives, while retaining flexibility for the master developer to make adjustments based on market conditions, pursuit of the certification, etc.?

Clearly, the project governance issues for a single mixed-use building are already complex. Some of the projects in the LEED-ND pilot program and the types that are likely to pursue LEED-ND certification once it is released to the public include large-scale, mixed-use or "town center" projects that could include multiple residential, office and retail buildings, hotels and other uses. In addition to the governance challenges that accrue just by virtue of the number and types of buildings in the project, there are also certain credits in the LEED-ND rating system that can create issues. Consider the challenge in structuring project documentation to allocate among the various parcels, buildings and owner/developers, the rights and responsibilities to ensure compliance with the following LEED-ND prerequisites and credits:

NPD Prerequisite 2: Compact Development, which requires the developer to build any residential components of the project at an average density of seven or more dwelling units per acre of buildable land available for residential uses, and build any non-residential components of the project at an average density of 0.50 FAR or greater per acre of buildable land available for non-residential uses, with the specified average density required to be achieved by the point in the project's construction at which 50 percent of dwelling units are built, or within five years of the date that the first building is occupied, whichever is longer.

NPD Credit 3: Diversity of Housing Types, which requires inclusion of a sufficient variety of housing sizes and types in the project such that the total variety of housing within the project, or within one quarter mile of the center of the project, achieves at least 0.5 according to a calculation based on the Simpson Diversity Index.

NPD Credit 4: Affordable Rental Housing, which requires inclusion of a proportion of rental units priced for households earning below area median income pursuant to certain standards and requirements for 15 years.

NPD Credit 5: Affordable For-Sale Housing, which requires inclusion of a proportion of for-sale housing affordable to households at or slightly above the area median income pursuant to certain standards.

GCT Credit 1: LEED Certified Green Buildings, which requires projects with up to five habitable buildings to design, construct or retrofit one of those buildings to be certified under one of the specified LEED building rating systems. Additional points (no more than three) may be earned for each additional certified building that is part of the project. For projects with more than six habitable buildings, it is necessary to design, construct or retrofit a specified percentage of the square footage of project buildings for certification under one of the LEED building rating programs.

GCT Credit 2: Energy Efficiency in Buildings, which requires design and construction of **at least 90 percent of all buildings** in the project such that they meet certain energy improvement requirements.

GCT Credit 3: Reduced Water Use, which requires design and construction of **at least 90 percent of all buildings** in the project such that they meet certain water efficiency requirements.

A review of these few credits alone poses such questions as: how will time requirement compliances be assured, such as those for achieving density targets? How will green building certification requirements be imposed and enforced for certain buildings? How will minimum energy and water efficiency requirements be allocated and assured on a per building basis to ensure compliance with project-wide goals? Because there are no form documents available to address these issues, knowledgeable counsel and creative and comprehensive document drafting are required for successful implementation and risk management. It has been this author's experience that many owners and other stakeholders believe there is a simple paragraph or magic contractual provision to insert into their documents to defray the risks. Unfortunately, no such easy prescriptive solution exists. Every project and the objectives and requirements of the parties are unique and require scrutiny. Furthermore, providing form language to those who do not understand the implications of negotiating revisions to the language may not be prudent.

CONCLUSION

Advocates of sustainable development argue that green buildings are "better" buildings for the environment and the health of our planet. Those offering effective criticism, including discussion of the potential for risk, may mistakenly be perceived as anti-environmental. Still, the reality is that while green buildings may very well be better buildings for the environment and the planet, depending on the measure and the particular building, there *are* risks inherent in building certified green buildings.

If we want to encourage more green building, we need to help all project participants understand and manage the project and process risks, including those related to entitling, marketing and governing green projects. ■

ENDNOTES

1. LEED® is a registered trademark of the U.S. Green Building Council.
2. *New Buildings Institute Final Report*, March 2008, "Energy Performance of LEED® for New Construction Buildings," Cathy Turner and Mark Frankel, pp. 1-4. It should be noted that this study was funded by the USGBC.
3. Ibid.

FOCUS ON GREEN BUILDING

Greening the Standard of Care: Evolving Legal Standards of Practice for the Architect in a Sustainable World

BY FREDERICK F. BUTTERS, FAIA, ESQ.

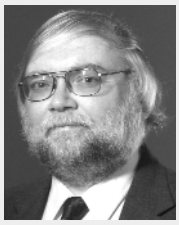
OVERVIEW

THE TASK OF DELIVERING GREEN OR SUSTAINABLE BUILDINGS requires the coordination of many parties in the chain of asset management and construction. Arguably, one of the more important figures in this process, particularly for new buildings and in the perception of the public at large, is the architect. Owners and developers commonly look first to architects for help with realizing their building plans. Even more important, they look to architects for counsel on designing their building projects to get the desired functional and performance outcomes. The American Institute of Architects (AIA) has recently taken up the idea of sustainable building as a signal attribute of the future of the architectural profession.[1] Surprisingly, this new position poses a disturbing new relationship between the architect and the client, which may have far-reaching consequences.

Like any professional, an architect is simply an educator. Indeed, no architect actually makes design decisions for a client. Instead, the architect merely educates clients so that they can make intelligent choices. That education defines the architect's obligations to the client, obligations commonly referred to as "the standard of care." The architect has a duty to use ordinary care in meeting that standard. The architect who does so will, in theory, avoid liability.

Although contracts and codes often benchmark the architect's duty, the profession itself actually sets the standard of care. Though the actual language will vary, standard jury instructions in most states define the standard of care as "doing that which the average similarly situated professional would do, or not doing that which the average similarly situated professional would not do." In a judicial proceeding, that standard is typically established through expert testimony—an architect whose testimony reflects and benchmarks the architect's level of obligation. The architect's conduct is measured against that benchmark. Where the conduct falls short, malpractice has occurred.

About the Author



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Since the day-to-day practices of the profession establish the standard of care, the profession itself changes the standard of care as the architect's commonly accepted practices and competencies change. Such changes have always occurred, usually on an incremental basis. However, with the onset of sustainable or "green" design, the standard of care has begun a dramatic upward push. Today's architect must acknowledge that change and the attendant risk, if he or she is to continue providing clients with appropriate services in the sustainable world.

THE ARCHITECT/CLIENT RELATIONSHIP

In addition to the educational element, the architect/client relationship is one of trust. All but the most experienced clients find the design and construction process bewildering. Contracts, forms, approvals and paperwork are complex and extensive. Even the language is different. Simply put, the client hires the architect to assist him or her in negotiating the process and obtaining a final acceptable result. The client has a right to rely on the advice the architect renders, and expects to do so. Ultimately, if the client forms reasonable expectations regarding the architect's services, the law will likely recognize and enforce those expectations.

While the architect often views the project from an aesthetic perspective, he or she must also recognize that nearly all clients view the project from a financial perspective. Many clients simply don't care about the architect's aesthetic "adventure." Although many clients do have aesthetic tastes and some pursue social goals in their projects (for example, some clients will pursue sustainable ends simply because "it is the right thing to do"—but even then, within some overall financial constraint), most clients are interested in three things, each of which directly affects their bottom line. First, what will the building look like? Second, when will the project be completed? Finally and most important, what will it cost?

To manage risk, one must first appreciate risk. To manage the evolving risk associated with sustainable design, the architect must understand that simple economics motivates many clients. If it costs more, the owner will generally expect that there must be some added value; since sustainable projects cost more (virtually all objective evidence supports that conclusion), they must be providing some additional tangible or intangible benefits to the client/owner.

THE ONSET OF GREEN OR SUSTAINABLE DESIGN

For decades the design and construction industries effectively ignored the long-term energy impacts of their buildings. The blame can properly be shared by the architectural profession and owners, and was consistent with "pre-green" views on energy costs. Since energy was relatively cheap compared with the cost of design features that maximized energy conservation, the economics drove design away from concepts that now are termed sustainable.

Today, the economics of energy (including the added weight given to long-term considerations) is driving owners toward design options for sustainable performance outcomes. This is not to say, however, that the economic benefits are clear-cut. Although the client may decide to incorporate sustainable features into a project for a variety of reasons, such features still cost money, and in virtually every case, some additional money (how much more is very project-specific, but the core fact that sustainability costs money really isn't in dispute). While it may be possible to do a sustainable project that as an overall budget proposition costs the same as a similar non-sustainable project, it is then necessary to fund the sustainable features through cost reductions in other areas of the project scope. The absolute bottom line is simply that sustainable features cost some money. The architect's advice is implicated in the decision to proceed with those features. This is especially true when the sustainable options require a life-cycle analysis to ascertain return on investment or environmental benefits. Consistent with the recent developments in sustainable design thinking, the architect actually becomes an advocate for those options and features. Where the client adopts those options and features and spends some incremental amount, the client expects to receive a reasonable return. If the law determines that these normal business expectations are reasonable for a client to hold, the architect will be called to answer if those expectations fail to materialize.

A common example involves the task of roof selection: in the interests of being "green," an architect specifies a light-colored single-ply membrane roof material without a long-term track record. The material must be replaced every 10 years. By contrast, use evidence suggests that an environmentally unfriendly coal tar pitch alternative will last 30 years. At the end of 60 years, the second coal tar pitch roof is just nearing the end of its life while the sixth single-ply roof is coming to the end of its life. In addition to the recurring cost of replacement, which approach results in less energy consumption and environmental impact when one factors in the installation of two roofs

versus six? If the architect's environmental or green concerns trump the client's economic interests, a lack of candor on the part of the architect may prove problematic. The difficulty with advocating, as every attorney knows, is the temptation to omit negative facts or to shade the facts in an effort to convince.

RECENT DEVELOPMENTS IN "SUSTAINABLE" THINKING

The AIA has thrust itself into the forefront of the sustainable design debate. With more than 83,000 practitioners among its members, the AIA represents a large percentage of the practicing architectural profession and plays a leadership role in establishing the standard of care. The standard of care applies to all practitioners whether or not they are AIA members. Several recent developments implemented by the AIA have had a direct and immediate impact on the standard of care.

As noted above, contracts can be a source of the architect's duty. The most recent iteration of the AIA documents is no exception. Looking at AIA B101-2007, the standard form of contract between architect and owner, sustainable duties are immediately apparent. That document provides, in pertinent part:

> 3.2.5.2 The architect ***shall*** consider environmentally responsible design alternatives such as material choices and building orientation, together with other considerations based on program and aesthetics that are consistent with the Owner's program, schedule and budget for Cost of the Work. (Emphasis added)

Thus under the AIA contract, for the very *first* time, the architect is actually required to consider and evaluate green or sustainable design alternatives as part of the base services.

The AIA Canons of Ethics create and impose similar duties, taken one step further. Under the modern Canons, the architect now actually has duties running to the environment. In that regard, Canon IV - Obligations to the Environment, specifically provides:

> Members should ***promote*** sustainable design . . .
>
> E.S.6.1 Sustainable Design: In performing design work, members should be environmentally responsible and ***advocate*** sustainable building and site design.
>
> E.S.6.2 Sustainable Development: In performing professional services, members should ***advocate*** the design, construction and operation of sustainable buildings and communities.
>
> E.S.6.3 Sustainable Practices: Members should use sustainable practices within their firms and professional organizations, and they should ***encourage*** their clients to do the same. (Emphasis added)

Aside from the novel idea that the architect has professional duties running to someone other than his or her client, the current Canons reflect a more fundamental shift. Rather than simply educating the client as necessary to place the client in a position to make an informed choice, the architect is now expected to "*promote,*" "*advocate*" and "*encourage*" a "sustainable" course (although the Canons leave to the imagination exactly how "sustainable" might be defined). Indeed, the architect must actually become an advocate for that undefined "sustainable" result. Since responsibility and liability are inextricably linked, where the architect is responsible for advocating a particular design approach, the architect certainly will be liable in the event that an advocated design approach does not achieve the desired result.

For example, the architect who takes the AIA documents' admonishment to "advocate" for sustainable design and sustainable products to heart and recommends to the owner an HVAC system based on a heat pump package that draws on a geothermal or water source. Unfortunately, the projections regarding the temperatures at which the geothermal or water source run are erroneous and the actual temperatures are warmer than projected. As a consequence, the system is less efficient and unable to maintain comfort on 10 percent of the warmest days in the summer. Tenants are angry and withholding rent. Vacant space remains vacant. The owner is faced with a complete retrofit of the HVAC system in order to resolve the problem at substantial expense. The owner looks to the design professional to correct the problem. While it may seem like a good idea, geothermal-based energy sources are unpredictable. If the architect does not clearly and sufficiently indicate the positives and negatives of the HVAC options, the client will be looking to the architect to make him or her whole. Becoming an advocate for many types of sustainable approaches may cause the design professional to overlook the messy reality for the sake of being a good advocate.

The prudent architect should also consider an additional implication of his or her duties relative to professional ethics. Under the law in most states, an architect may render truthful and ethical advice to his or her client, free

from any concerns over liability to third parties. In more than a few instances, codes of ethics promulgated by various professional societies have been used as a basis for the conclusion that specific advice rendered by a professional was not "ethical." Where the advice is not truthful and ethical, the privilege protecting against third-party liability does not apply and the architect is open to claims by third parties.

For example, an architect may know full well that there is conflicting or contradictory evidence for the use of a certain product or system, but demurs at providing the owner with this full disclosure of the current state of the evidence. Instead he advocates and encourages by providing only positive and glowing reports of the product or system under consideration. The architect has now become an advocate, not a professional. This puts the architect in a sticky position: is he an advocate first and professional second, or vice versa?

While the interplay between advocacy, truth and ethics may not seem significant, on closer examination it is apparent that they are indeed aligned concepts. While the architect who simply evaluates options and educates a client so that client can make an intelligent choice is likely rendering truthful and ethical advice, is the architect who takes an additional step and actually advocates for a particular result also doing so? Can an architect advocate for a particular approach only if he or she actually knows that approach is in the client's best interests—even though that approach might be in the interests of the planet or the greater public good? Where the architect actually becomes an advocate, is the resultant advice a product of truth and ethics or is it a product of advocacy? If the advice is a product of advocacy, the legal privilege and its attendant defense are lost. On its surface, the AIA definitions of "ethical" and "advocacy" now appear to be, at least to a degree, interchangeable. Consistent with the overall educational purpose behind the architect's approach, does the architect now have a duty to inform the client that his or her "sustainable" advice may not be what is in the best interests of that particular client, but may be in part the product of sustainable advocacy? Unfortunately, these questions are not academic and esoteric. To the contrary, this principle has been the source of at least a few recent claims against architects. These are largely unresolved issues to be sure. What stands between current reality and the answers to those questions is likely substantial and expensive litigation.

To be sure, a number of owners will accept sustainable options for the simple reason that they are indeed in the interests of the planet or the greater public good. However, the architect's traditional role has not included taking advocacy positions in favor of those results, and the law has developed accordingly. Therefore, an architect who does become an advocate would be well advised to make certain that the client is well-educated as to his or her role, and understands fully that advice given is given from an advocacy perspective instead of a simply advisory perspective. As with any advice given by any professional, placing the client in a position to intelligently evaluate the advice is the key. Approaching the rendering of professional services as an advocate instead of an educator elevates concern exponentially.

The march toward sustainability goes beyond contracts and ethics. In addition, AIA promulgates policy statements that guide and shape its decision-making on evolving issues. Those policies include specific statements on sustainability:

> "The creation and operation of the built environment requires an investment of the earth's resources. Architects must be environmentally responsible and ***advocate*** for the sustainable use of those resources.
>
> Architects need to accept responsibility for their role in creating the built environment and, consequently, we must alter our profession's actions and ***encourage*** our clients and the entire design and construction industry to join with us to change the course of the planet's future." (Emphasis added)

Yet again, the policy statements reflect the view that the architect is expected to encourage and advocate for the undefined "sustainable" result.

Finally, in order to make certain that its members are fully cognizant regarding the extent of the shift to sustainability, continuing education requirements have changed to include a "sustainable" obligation. Prior to 2008, an architect was required to complete continuing education credits on an annual basis to maintain AIA membership. Starting in 2008, that continuing education must include at least four hours in "sustainable" design. Although the term "sustainable" remains undefined, consistent with its views that "sustainability" is a welfare issue, the AIA will count "sustainable" credits against a member's annual continuing education requirements for health, safety and welfare, a status traditionally reserved for courses on life safety, building codes and regulations.

It is apparent that the AIA has a "sustainable" agenda. It is not yet clear where this agenda may lead, but it seems that the AIA intends to use all opportunities available to it as a professional association to push the envelope in its efforts to lead the way. It is certain however that the approach engenders an advocacy role for the architect, beyond the traditional advocacy that may occur in favor of a particular aesthetic decision.

THE LEED®-ACCREDITED PROFESSIONAL

In addition to the practice changes pushed onto the architect by external forces, many architects intentionally elevate the demands placed upon them by their own professional actions. In this regard, the effect of the U. S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) accreditation must be considered. Since every action creates a reaction, there can be no doubt that securing LEED accreditation changes the complexion of architectural practice.

To have an honest discussion on this subject, one must first question the traditional motivations often proffered for seeking LEED accreditation. When the question is put to most architects as to why they sought LEED accreditation, the typical answer is something to the effect that LEED accreditation makes them better able to address the intricacies inherent in sustainable practice. While that may well be a portion of the motivation, it isn't a complete answer.

Most architects spend the time, trouble and expense of securing LEED accreditation for one simple reason: to instill in clients and prospective clients the notion that the architect is capable of performing sustainable design—more capable of doing so than the similar but non-LEED accredited architect. Viewed in that context, the process of accreditation is sometimes undertaken for a reason not often discussed or admitted—the same basic reason that motivates most conduct in the business world—financial gain. By becoming LEED-accredited, the architect seeks to enhance his or her competitive position in the market, plain and simple. At a minimum, the architect must recognize that even if he or she holds a "non-economic" motivation, in the mind of the client, the LEED accreditation carries with it the perception that the accredited architect embodies a higher level of competence in "sustainable" design than the non-accredited architect. At least the client will make just such an argument if and when a problem arises.

Irrespective of the motives behind LEED accreditation, there can be no doubt that mere accreditation itself will heighten the expectations of most clients. *Heightened expectations must either be met with heightened performance, or unmet expectations will result*. Unmet expectations are at the core of almost every client management problem.

THE EVOLVING STANDARD OF CARE

Can there really be any doubt the architect is now a "green" or "sustainable" expert? At a minimum, the contracts say so, the ethical guidelines say so, the public policy statements say so, and LEED accreditation implies it is so. Doesn't a client who actually believes the architect is a "green" or "sustainable" expert hold a reasonable expectation to that effect? Indeed, the client generally pays more to incorporate sustainable features into a project on the expectation those features will pay back in the form of increased performance over time. If the architect is serving as an educator, the client's decision to "go green" may be only that—the client's decision. However, if the architect is "encouraging" or "advocating" for the incorporation of green features, his or her advice is implicated in the design decision. In that instance, the possibility that the architect can avoid the effect of the client's unmet expectations is low.

It is of course impossible to define the effect the onset of green or sustainable design is having on the standard of care. Attempts at clarification will no doubt come during the course of litigation arising from these unmet expectations. However, as the profession accelerates its acceptance and dissemination of green advocacy as a linchpin of practice and architectural education, there can be little doubt that the demands on architects are increasing. Professional enthusiasm may, in fact, be increasing the risks for both the architectural profession and the clients it serves.

MANAGING THE RISK

With all of the cautionary discussion, what is the architect to do? Most owners have been driven by cost considerations. Where those cost considerations were once limited to initial costs, energy prices dictate the savvy owner should place a higher emphasis on long-term operational costs. The architect who refuses to accommodate will find either a shrinking client base or substantial unmanaged risk. Ignoring the new realities of energy costs affecting their clients is not a viable option if the architect wishes to remain in business and competitive. Managing the risk is the only viable option. However, one cannot manage the risk unless one appreciates the risk.

The evolving nature of the standard of care has always placed upon the architect the duty to adapt his or her practice to the changing demands of the profession. The onset of sustainable or green design is really no different, with one major exception. Where changes in the standard of care are typically slow and incremental, changes driven by sustainable design are occurring at a much faster pace.

Thus, the architect's response should be similar to what it has been historically. Educate the client, don't advocate to a client unless it is fully transparent as advocacy, and remember that a client expects to be given objective counsel. Document the process and the decisions. Make certain the client has realistic expectations relative to what the architect can likely deliver. Don't over-promise. Make certain marketing materials and statements are consistent with capabilities. Understand the products you recommend or specify, along with any manufacturer's warranties. Be cautious of new materials that lack a track record. Question the manufacturer's specifications and prototype testing results. Don't make representations regarding products or performance that could be considered a warranty. In short, do all of the things the architect would normally and should normally do on any project.

Comprehensive risk management demands a comprehensive review of all aspects of a business. Common and often overlooked risk concerns for architects pursuing or touting green design include marketing materials and Web sites. Often, a Web site is created and posted with information by in-house staff or marketing companies with little understanding of the risk issues associated with its content. The Internet is replete with Web sites for architectural firms with language that promises potential clients actual reductions in energy consumption. That language has a habit of reappearing at the most inopportune time—such as when a client who believes he or she didn't actually receive the promised energy benefits in exchange for the higher cost of the design and the construction of his or her project begins to formulate a claim. The seemingly innocent statements on the Web site now become evidence. Even worse for the architect, if the representations rise to the level of fraud or misrepresentation, the architect will likely find that coverage is excluded under most A/E malpractice insurance policies.

CONCLUSION

Sustainable or green design doesn't add anything new to the fundamental legal theories of liability or techniques of risk management for architects and their clients. However, it does reduce the traditional margin for error the design profession has historically enjoyed. Working within a narrower margin with a client who has heightened and possibly elevated expectations, the architect must become and remain even more vigilant.

The ultimate advice to architects is to not avoid engaging in projects that include green or sustainable design concepts. Given the current public clamor for green design, and given current energy cost trends, it is unlikely that any architectural office could remain competitive rejecting that work in its entirety. As a result, the architect's risk-management sensitivity will be tested as adherence to traditional risk reduction and avoidance mechanisms becomes central to negotiating this evolving practice area.

The advice to owners, on the other hand, must be to pay particular attention to the fact that architects may be presenting building project options as advocates for sustainability. This will often mean that social welfare concerns having little or nothing to do with the economics of an owner's building project will be the basis of recommendations made by the architect or LEED consultant. There is certainly nothing wrong with an owner pursuing more general social welfare goals for a building project, but this should be done knowingly and with full information.

In sum, everyone should know what everyone else is doing and why. Anything less is nothing short of an invitation to disaster. ■

ENDNOTES

1. See generally, *http://www.aia.org/SiteObjects/files/sustain_ps.pdf*., last accessed on Sept. 6, 2008. The engagement of the national AIA and all its local chapters is too vast to itemize, but it should be noted that the interest in "green" at this massive scale is less than five years old.

FOCUS ON GREEN BUILDING

Trust, but Verify… Building Enclosure Commissioning in Sustainable Design

BY DANIEL J. LEMIEUX, AIA

INTRODUCTION

SUSTAINABLE DESIGN DOES NOT NECESSARILY RESULT IN A sustainable building. As an architect practicing in the area of building enclosure failure investigation and repair design, personal experience has taught me that there is often a sizeable gap between design intent and actual performance. This is particularly true when viewed in the context of the overheated rhetoric currently surrounding "green" building and sustainable design. The benefits of solar, wind, double skins, various insulating technologies, and an endless array of materials and methods all require serious performance verification before owners of real estate can feel comfortable that their investment is truly "green" and, more critically, that their investment is economically viable in the long term.

To assure the economic viability and performance of the sustainable building (or any building for that matter), it is crucial to understand two things. First, one can only verify what one can measure. Second, it is important to understand from the beginning the business goals shaping the performance requirements of a building asset. What needs to be measured will be determined by these larger business issues, and the verification protocols must be tuned accordingly. The recent National Institute of Building Sciences (NIBS) report to Congress regarding the attributes of a "high performance" building is instructive and worth keeping in mind. It says:

> "The high-performance building concept comes at a time when the building community is being pulled in many directions and is in need of a framework for balancing competing interests. The increasing popularity of sustainable or "green" building, post-9/11 safety and security concerns, the new contractual and delivery methods available to builders, and the market mechanisms driving institutional investors to seek out energy and other efficiencies in building asset portfolios all confirm that this is the right time to begin …".[1]

The operative word here, of course, is "*begin.*" As we stand on the precipice of what can be fairly judged a sea-change in the role of the architect in sustainability and environmentally conscious design, it is becoming increasingly vital that we, as architects, resist the temptation to "greenwash," and instead look critically at our own role in this process and the tools available to us to truly deliver on both the potential and the *promise* of high-performance buildings and sustainable design.

About the Author

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THE CHANGING ROLE OF THE ARCHITECT: PERCEPTION VS. REALITY

In a thoughtful discussion of the changing role of architects, Professor Barry Yatt of the School of Architecture at Catholic University in Washington, D.C., recently wrote: "Architects see themselves and, to a larger extent, are seen by society as "creative types." As a culture, we recognize these individuals as renaissance people—licensed professionals who think in the abstract and possess the rare combination of vision, creativity and the scientific rationale necessary to bring us informed, responsive and, in some instances, truly inspiring and thought-provoking design. This notion of the architect's place in our society is reaffirmed time and again in the popular press when business leaders and politicians are referred to as the *architects* of a given mission or success—be it the start of a successful new business or, perhaps, the outcome of a successful piece of legislation. We use the term reverentially because, as a society, we have come to recognize architects as individuals with a proven ability to solve major problems through the use of a creative, yet structured and thoughtfully applied intellectual process."[2]

Ironically, this societal view of the architect has begun to apply less and less to those who, by definition, are actually engaged in the practice of architecture. Due largely to development models that increasingly reflect near-term profitability rather than long-term durability and performance—*and the corresponding increase in liability and risk associated with this shift*—architecture has evolved into a profession that, in many respects, is better known for the services and expertise it no longer provides than for the services that were once the foundation of the profession. In-depth technical research, comprehensive and effective detailing during the design phases of a project, and a commitment to regular inspections of the work during construction to ensure proper installation and performance have increasingly fallen victim to the demands of compressed schedules and often, unrealistically low budgets. Architects recognized this shifting demand and responded by reducing their scope of services—*and shielding themselves from liability*—by outsourcing these tasks to what has become a breathtakingly large and still expanding field of design consultants. Developers, for their part, unwittingly contributed to this shift by creating a more competitive environment for design services during the conceptual stages of a project—an environment that, while perhaps more cost-effective in the near term, nonetheless contributed to the compartmentalization of design and an attempt, in many instances, to redistribute design responsibility "downstream" into the construction industry and trades—arguably lowering the bar for a profession that is increasingly unwilling or unable to invest the time and resources necessary to respond to the rapidly evolving technical challenges of a project.

"It should come as no surprise, then," says Professor Yatt, "that developers increasingly turned to consultants to fill this void. And architects who did, in fact, invest the time and financial resources to design responsively, increasingly found themselves facing a market that no longer expected to see them in this role."[2] While design responsibility (and fees) for architects engaged in traditional practice have suffered, the number of players and costs associated with a project team have continued to increase, with (arguably) little or no significant reduction in risk for the owner/developer, and only minimal gain in the long-term durability and performance of the buildings that continue to emerge from this process.

How do we address this concern? One popular refrain among owners, developers and contractors is to reflect wistfully upon the idea of the architect as *master builder* "… that legendary paragon of creativity and pragmatism that once guided both design and construction before the increasing complexity of building technology warranted building codes and public regulation of teh architecture profession."[2] As tempting as it may be for architects to want to resurrect that ideal, the notion that the profession will return triumphantly to recapture that mantle is one that can only be viewed through the romantic lens of history. It holds little or no promise when viewed through the multi-faceted prism that has come to define project delivery today. Perhaps, then, it is more appropriate to consider the possibility of an architect (or engineer) serving as the *steward* of the pre-design, design and construction process—a design professional who possesses a level of base-building knowledge, intellectual curiosity and technical competence necessary to understand, evaluate and effectively balance the desire to take advantage of rapidly advancing construction materials and technologies with the reality (and often competing interest) of initial project cost, life-cycle cost, short- and long-term environmental impact, energy efficiency, and the long-term durability, serviceability and performance of the modern building enclosure. These are the same principles we consider fundamental to good design practice and, by definition, sustainable design.

WHY COMMISSION THE BUILDING ENCLOSURE?

In any effort to produce a new building project or manage an existing building asset, proper design and maintenance of the building enclosure is vital. This is even more critical when trying to create or manage a sustainable building. In general, the transfer of heat and moisture between the building interior and exterior has a fundamental impact on the design and eventual operation of a building asset. The heat transfer through the building envelope, including both the facades and the roof, dominates the design requirements in virtually all buildings with floor plates smaller than 15,000 square feet and, depending on the building configuration, can have a significant effect for buildings with larger floor plates. Generally speaking, the impact of the building envelope penetrates to 15 feet from the envelope in most buildings.[3] Therefore, proper design and maintenance of the building envelope is crucial to the sustainability and eventual durability of the asset. Building envelope failures quickly obviate the best laid plans for an energy-efficient building as we shall see in the Chesapeake Bay Foundation building below.

Energy efficiency is not the only goal of a sustainable building. Other goals include indoor environmental quality and durability. Simply put: uncontrolled rainwater penetration, condensation and moisture ingress are three of the most common threats to the long-term durability, structural integrity and performance of the building enclosure. In the past, statistical data has suggested that collectively they represent up to 80 percent of all construction-related claims in the United States.[4] Today, a new pipeline of litigation has been added to that list—one that arises not simply from the deleterious effects of moisture intrusion, but rather from the noble, though perhaps short-sighted and frequently ill-informed objectives established for energy efficiency in the name of sustainable design. The continuation of this trend is troubling, and has only taken on added significance when one considers the irrational exuberance that now appears to surround sustainable design and the rush to mandate the objectives of the United States Green Building Council (USGBC) through hastily crafted and what may prove to be short-sighted and ill-conceived legislation. The changing role and perception of the architect have contributed to this trend.

In an effort to more clearly deal with the risks associated with the failure of design and maintenance of the building envelope, a whole new area of technical design, forensic analysis and redesign has arisen. The primary motivation for the recent concept and practice of Building Enclosure Commissioning (BEC) has been to address the common technical deficit of most architectural detailing practices and the increased recognition of owners and insurers of the significant losses in functionality and asset damage as a result of poor building envelope design and maintenance.

BUILDING ENCLOSURE COMMISSIONING IN SUSTAINABLE DESIGN

Often, in order to achieve a holistically designed, energy-efficient and properly functioning building, careful attention both to global design objectives and to details is required, beginning at the initial programmatic stages of a project and extending through the pre-design, design, construction and post-occupancy phases of a project. The greater the risk associated with the project—typically a function of building type, intended use, location, climate or exposure—the greater the need for confidence in the long-term durability and performance of the materials, components and systems that will support and condition that building and protect those within from the surrounding environment. Creating check lists and maintaining a written record of mechanical system design and initial verification of operability and performance are tasks associated with the traditional role of the Building Enclosure Commissioning Agent (BECx). Recognizing the *interdependency* between the performance of these systems and effective design, detailing, integration of the materials, components and systems that comprise the modern building enclosure (and having the professional background and technical expertise to appropriately influence that process) is the role of the BECx.

To assist in further defining this concept, *NIBS Guideline 3* (2006): "Exterior Enclosure Technical Requirements for the Commissioning Process" offers the following definition:

> "The Commissioning Process is a quality oriented process for achieving, verifying and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria. The Commissioning Process assumes that owners, programmers, designers, contractors, commissioning team members, and operations and maintenance entities are fully accountable for the quality of their work. The Commissioning Team uses methods and tools to verify that the project is achieving the Owner's Project Requirements throughout the delivery of the project."

While this definition covers the broader context of traditional building commissioning, the BEC process endeavors to take it a step further by *actively engaging*, rather than *assuming*, ". . . that owners, programmers, designers [and] contractors . . . are fully accountable for the quality of their work." In other words, ". . . *verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended. . .* "[5] with a particular focus on the design and construction of the building enclosure. This is accomplished through comprehensive design peer review, detailing assistance, pre-construction and construction period performance verification testing, and post-occupancy evaluation of the completed project to ensure performance is consistent with the Owner's Performance Requirements (OPR) established during the initial programmatic stages of the project. *Trust, but verify*[6] is the premise of the BEC, and a properly educated and trained design professional is uniquely qualified to serve the BECxA and *steward* of that process.

THE BUILDING ENCLOSURE COMMISSIONING PROCESS

Optimum building performance begins at conception. That is both the premise *and the promise* of the BECx process. In order to achieve a fully integrated, high-performance building—one in which the design of the building enclosure reaches beyond the aesthetic and begins to support *and enhance* the comfort and productivity of the end user—it is critical that issues of serviceability, durability and performance receive the same weight as those associated with programming, massing, site orientation, and climate. These concepts are inextricably linked, of course, and must be fully considered during the early stages of a project, when ideas are promulgated and images begin to form. The traditional Commissioning process has long held that optimum building performance can be achieved through the proper design, balancing and operation of base-building mechanical systems. The BECx process builds upon that notion first by: a) recognizing the rapid pace at which building enclosure systems and technologies continue to evolve (and the limitations that often exist during the design process to properly evaluate and apply those technologies); and b) mandating that a design professional well-versed in building enclosure design and, more critically, *failure*, are given seats at the table and an opportunity to positively influence the direction and outcome of a project. In its purest form, the BECx process can be summarized as follows:

Pre-Design

Establishing performance objectives that will support and enhance the comfort and productivity of the end user by ensuring that the goals associated with initial design and construction costs are properly aligned with the long-term objectives of energy efficiency, serviceability, durability and performance (the hallmarks of good design practice and, arguably, the very definition of *sustainable design*);

Design

Ensuring consistency during the design process by requiring that performance objectives established at conception are properly maintained throughout the schematic design, design development and construction document phases of the project;

Pre-Construction

Verifying the design through detailed and effective submittal review, followed by the construction and subsequent performance testing of a full-scale, pre-construction mock-up and further design refinement as required to better reflect the realities that exist among the building contractors and trades without sacrifice to the performance objectives established for the project;

Construction

Validating the construction by working closely with the individual contractors and trades to periodically review and evaluate the work in progress, as well as to provide technical guidance and quantifiable field quality assurance testing at critical stages *throughout the construction process;*

Post-Occupancy

Improving performance and the future of truly sustainable design through a carefully crafted, well-conceived post-occupancy performance evaluation program that analyzes actual performance in a manner that is quantifiable and can be accurately measured against the performance objectives established at the outset of a project (the necessary evolution of good design practice will rely heavily upon this step).

Optimum building performance begins at conception. It is a concept worth repeating, if only to underscore the critical need to re-establish *first-principles* thinking to the design and construction of our built environment. As the following case study will attest, the BECx process offers an opportunity for design and construction teams to re-embrace that principle, and to establish *quantifiable metrics for performance testing and validation* that demand accountability at every stage of the design and construction process.

A "PLATINUM" CASE STUDY

Introduction

Designed and constructed almost entirely of rapidly renewable and/or recycled building materials and systems, the Phillip Merrill Environmental Center[7] has been recognized both regionally and nationally in the U.S. as the first project to achieve the Platinum rating under the USGBC LEED® rating program first introduced in 2003. As a symbolic representation of the owner and its mission (a not-for-profit, environmental advocacy group), the overall design aesthetic, placement on the site and creative use of passive heating and cooling, rainwater recovery, stormwater management and similar innovations have been widely recognized as unique and successful by design professionals and the sustainable design community. However, the location and exposure of this building, the architect's choice of materials, and the manner in which those materials have been incorporated into the building enclosure created a series of challenges for the owner with regard to the long-term maintenance and care of this structure.

BASE BUILDING DESIGN AND INNOVATION

The Phillip Merrill Environmental Center is located near a coastal environment on the eastern shore of the U. S., in what can be defined as a mixed-humid climate.[8] The building is exposed to large volumes of wind-driven rain and to high humidity during the summer months. The project contains numerous innovative applications in an attempt to obtain the rating. Following is a summary of some of the unique technologies and design functions included in this property:

- Water usage in the building is less than ten percent than that of a similar conventional office building. This is accomplished by several means including the use of waterless urinals and composting toilets. An extensive rainwater collection system filters and recycles rainwater for fire suppression, hand-washing, mop sinks, desiccant unit make-up, laundry, and gear-washing equipment. This redirection of rainwater eases the volume of storm water flow out of the building and into the surrounding watersheds and ecosystems and reduces the need to draw from groundwater wells or from municipal water systems. Hot water is provided by a solar hot water heater, which reduces energy consumption.
- In the area of energy conservation, the building utilizes passive solar heating by capitalizing upon its large expanses of glass on the south and east elevations. Operable louvers and shades are positioned at these elevations to help minimize summertime heat gain, enhancing cooling and reducing electric bills, while still allowing winter sun to enter and passively heat the building.[9] Structurally insulated panels (SIPs) were selected for this structure instead of conventional framing to reduce the use of wood and increase the insulation value of the structure. Photovoltaic or solar panels are used to convert solar energy to electricity, and a complete energy management system monitors and optimizes the building's energy usage. A ground source heat pump is used in conjunction with a desiccant dehumidification unit to eliminate the need for a mechanical system for air conditioning, and the heat pump also assists with heating the building in the winter. Interior sensors on the interior measure the light supplied from the windows and, when sunlight is abundant, the amount of electric lighting is minimized.
- Material selection focused on supplying recycled, salvaged and rapidly renewable materials to construct the building. The absence of interior walls and finishes also greatly reduced the need for additional materials found in more conventional structures. A great majority (80 percent) of the materials were found within a 300-mile radius of the site. Materials incorporated included cork flooring and bamboo for stairs and flooring.
- Windows provide natural day lighting and views of the surrounding natural habitat. Indoor air quality for occupants and visitors was addressed via passive natural ventilation and mechanical ventilation, combined with zero-volatile organic compound (VOC) paints and adhesives, natural materials, and direct venting and non re-circulating air in rooms where chemicals might be used. Operable windows have an indicator light at the base to indicate when environmental conditions are right for windows to be opened.

Material Selection and Design of the Above-Grade Building Enclosure

The building enclosure on this project consists primarily of exposed, engineered-wood "parallam" columns, beams and trusses; galvanized steel roofing and siding; pultruded fiberglass window systems and SIPs. The SIPs consist primarily of a center core of rigid insulation board sandwiched between an inner layer of oriented strand

board (OSB) and an outer layer of either exterior grade plywood or OSB protected by a second layer of exterior grade plywood. Exposed wood elements were treated after installation with semi-transparent, breathable water repellent. Frame joinery between the SIP panels and the adjacent parallam structural elements, metal siding and window frames was to be back-sealed and protected by exposed wood batten strips.

Investigation and Repair

Although our investigation revealed a variety of both design and construction defects that resulted in direct, uncontrolled rainwater penetration through the exterior walls and roof of this property, we were particularly struck by the impact that material selection alone appeared to have on the overall performance of the building enclosure. In the context of sustainable design, this was especially noteworthy in that the advantages relative to the LEED rating system that may have been associated with the use of SIPs, parallam wood structural elements, wood batten strips and similar energy-efficient and renewable resources also appeared to have further complicated the already difficult task of properly installing and integrating these materials into a fully functional building enclosure. This was particularly evident at facade interface conditions, where the surface characteristics inherent in the parallam products and the manner in which they are assembled proved extremely difficult to effectively seal and properly integrate with the surrounding SIPs, galvanized steel siding, metal copings and related construction. Given the relatively rapid development of in-service warping, twisting and checking of these products evident during our investigation, we concluded that the somewhat unique use of wood products on this project, while effective in conveying the design intent of the architect and vision of the owner, nonetheless created a building enclosure that, in our judgment, was extremely vulnerable to moisture-related deterioration and, as such, would very likely be difficult and costly to effectively maintain, requiring frequent and carefully monitored routine maintenance and periodic replacement of wood facade elements by the owner.

Based on our survey of actual rainwater penetration that occurred on the project since substantial completion, as well as our own field water penetration testing at representative sections of the building facades, the following conditions were determined to be the primary sources of rainwater penetration on this building:

- Interfaces between facade elements (joints between SIPs and parallam columns and beams);
- Window locations at pultruded fiberglass gang-mullions;
- Roof terminations and interface conditions at rooftop dormers;
- Interfaces between roof and exterior wall and roof assemblies;
- Roof penetrations.

When considering the range of potential repair options available for this project, we recommended that careful consideration be given both to the long-term durability and performance of the materials themselves in this climate, as well as to the manner in which those materials would be detailed at each of the facade interface conditions to produce a fully integrated, weather-tight building enclosure. In addition, because the building would remain occupied and in use throughout the repair process, we recommended that the repairs be carried out in a manner that would allow for full implementation from the exterior, with minimal interruption to the daily use and occupancy of the building. Striking an effective balance among each of these considerations, particularly in the context of sustainable design and the prerequisites associated with the LEED rating system proved difficult, ultimately resulting in a final recommendation that the architect consider adopting a "rainscreen" approach to guide the repair process.

Following this recommendation, the architect developed a series of facade details that would, in essence, enable the primary drainage plane for the exterior wall system to reside inboard of the exposed wood spandrel panels and batten strips. In this configuration, it was determined that the impact of continued in-service deterioration of the wood facade elements on the weather-tight integrity of the building enclosure would be significantly reduced or eliminated, thereby enabling the facade to function and appear as originally intended by the architect while also providing a layer of protection for the U.V.-sensitive products and materials to be used at the primary drainage plane. The repairs were designed and successfully implemented in the year following our investigation, and to the best of our knowledge, have restored the weather-tight integrity and intended performance of the above-grade building enclosure without sacrifice to the original LEED Platinum rating awarded the property.

Hindsight, of course, is 20/20. However, several of the concepts ultimately adopted to guide the repair of this property (in particular, the "rainscreen" concept) might have arisen earlier in the design process under a more formal BEC program and, therefore, perhaps been incorporated into the design prior to the development of the construction documents for this project. Regardless, one fact is clear: the commitment of both the architect and general contractor to the significance of this property as a symbol of sustainable design and construction excellence has since resulted in the cooperative development and successful implementation of a repair program that has addressed uncontrolled rainwater penetration at this property without significant sacrifice to the fundamental principles of USGBC that formed the basis of this project and initial rating.

CONCLUSION AND POSTLOGUE

Since the original publication of the case study in 2004, a new pipeline of litigation has already begun to form—one that arises not simply from the deleterious effects of moisture intrusion, but rather from the noble, though perhaps shortsighted and frequently ill-informed objectives established for energy use, serviceability and overall building performance in the name of sustainable design. While it is difficult to predict the impact of these developments on project delivery and the practice of architecture as it has currently evolved, one prediction is worthy of note:

> "Architects are not typically certified in specialties; however, LEED® Certification (as it is now defined under AIA B214 [the standard contract document recommended for use in the delivery of additional LEED certification services by the architect]) changes that general rule. The LEED®-certified Architect will, therefore, likely be held to a higher standard."[10]

In the context of building enclosure design, failure of the building enclosure continues to originate largely from errors and omissions arising from a frequently truncated and short-circuited design process—one that reflects the compartmentalization of design and, in many instances, the attempt to reallocate design responsibility "downstream" to the subcontractors and trades responsible for the work. In defense of this practice, one architect opined:

> "It is not the standard of care to provide exhaustively detailed and annotated documents. If architects were expected to provide the level of detail, our fees would need to increase dramatically or we would be out of business quickly…".[11]

Unfortunately, this is a relatively common refrain—and a very telling comment relative to the current state of the design profession. However, the language in current building code—and available case law for which the author has become familiar—implicitly rejects this logic:

> "Construction documents for all buildings shall describe the exterior wall enclosure in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall enclosure as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane, and details around openings. The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall enclosure. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used."[12]

Each of these developments is a reminder of the need for architects to step forward and serve as stewards of the pre-design, design and construction process, and of the promise that Building Enclosure Commissioning holds to ensure that design and performance objectives established at the outset of a project—particularly in the context of sustainable design—are reliably maintained during construction, and properly validated as part of the overall commissioning and post-occupancy evaluation process. ■

ENDNOTES

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FOCUS ON GREEN BUILDING

Expanding the Principles of Performance to Sustainable Buildings

BY JAMES E. WOODS, PH.D., P.E.

A MAJOR ISSUE IS EVOLVING WITH REGARD TO THE MEANING and implications of the term "building performance." To some, this expression means a promise to design buildings that will function in accordance with "green" or "high-performance-green" ratings. Others aspire to operate safe, secure and healthy buildings. And most owners expect their buildings to yield attractive rates of return on investment. Yet the criteria with which to measure and evaluate actual building performance are seldom defined in objective and measurable terms. The intent of this article is to explore this issue by reviewing the concepts and principles of building performance, the functional status of the existing building stock, and the risks and opportunities associated with accountability for the performance of these buildings.

THE IMPORTANCE OF BUILDING PERFORMANCE

Fundamentally, buildings have a two-fold purpose: 1) to provide safe, healthy and secure conditions for occupants; and 2) to facilitate the well-being and productivity of the occupants, owners and managers of the property. If buildings are designed, constructed and operated for this purpose, the natural consequences are effective use of energy, environmental and financial resources. Conversely, if promises and policies are made to minimize energy consumption and environmental impact without achieving the two-fold purpose, then safety, health, security, and economic risks are likely to increase.

To credibly account for how well a building is achieving its two-fold purpose at any time during its useful life, objective methods for measuring and evaluating building performance are required. Based on principles of control theory and the assumption that a building functions as a system:

> *Building performance* can be defined as a set of *measured responses* of the building, as a system, to anticipated and actual *forcing functions.*[1]

In this definition:

- *Measured responses* are data that are obtained in terms of valid parameters and values of human responses (e.g., perceptions and judgments), occupant exposures (e.g., environmental stressors that affect human responses), system performance (e.g., measurable factors that affect occupant exposures), energy consumption and economic performance (e.g., consequences of system performance and occupant behavior).[2]
- *Forcing functions* are quantitatively determined physical and social forces that perturb the building

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> system and the measured responses during both normal and extraordinary conditions.[3] Sources of physical forces include climate (outdoor temperature and humidity conditions), wind, rain and snow loads (hurricanes, tornados, blizzards), earthquakes, fires, floods, chemical and biological releases, and blasts. Sources of social forces include aesthetics, economic and other motivations of occupants, tenants and owners, secular trends (e.g., policies on smoking, green practices), and threats (e.g., job security, reliability of utilities, criminal intent, terrorist activities).

This definition of building performance does not presume a predetermined quality of performance. However, some other definitions have been promulgated that promise a certain quality of performance (e.g., green, high, net-zero energy, sustainable), but have not defined the constellation of forcing functions or the set of responses in measurable terms that can be used to evaluate and account for the actual building performance under normal or extraordinary conditions, which may be caused by natural, accidental or intentional hazards.[4] Such a qualitative definition has recently been proposed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE):[5]

> A *high-performance green* building is defined as "a building designed, constructed and capable of being operated in a manner which *increases environmental performance* and *economic value* over time, *safeguards the health of occupants*, and *enhances satisfaction and productivity of workers* through *integration* of *environmentally-preferred building materials*, and *water-efficient* and *energy-efficient systems*." (Emphasis added)

In this ASHRAE definition, the physical or social forcing functions for normal and extraordinary conditions (e.g., weather conditions and anticipated hazards) are not identified, but the italicized terms promise improvements (i.e., increases, safeguards, enhancements) of response functions and processes that may not be quantitatively measurable.

A comparison of these definitions indicates that risks are inherent in promising building performance that cannot be objectively measured and evaluated for compliance with established criteria (e.g., building codes and standards, contract requirements, owner and tenant policies). Some of the risks associated with the unfulfilled promises of achieving high-performance green buildings during the design process have been discussed by Butters.[6] Similar risks are also expected as a result of unfulfilled promises made to justify modifications, renovations, or changes in operations within existing buildings.

FUNDAMENTAL CONCEPTS AND PRINCIPLES OF ENVIRONMENTAL CONTROL

To achieve and sustain the fundamental purpose of buildings, environmental control must be provided to meet the following objectives:

1. Prevent adverse health and safety effects during normal and extraordinary or emergency operational conditions;[7]
2. Provide for desired conditions of human response, occupant exposure, and productivity.[8]

In general, the quality of control required to achieve the second objective also provides the means and methods required to achieve the first objective.

TWO PRIMARY PRINCIPLES

To meet these objectives, simultaneous control is required for at least four indoor environmental parameters (i.e., thermal, lighting, acoustics and indoor air quality [IAQ]). The priority of the site-specific control strategies and the range of values of the selected control parameters should be based on two primary principles: 1) the Maslow Hierarchy of Needs (physiological, safety and security, belonging, esteem and self-actualization);[9] and 2) the definition of Health as defined in the Constitution of the World Health Organization (WHO): "A state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity."[10] From the perspective of building design and operations, these two principles are synergistic:

- The WHO definition of Health emphasizes that control to prevent illness is necessary but is not sufficient to provide for occupant well-being;
- The Maslow Hierarchy of Needs emphasizes that control to provide for occupant well-being must include the higher order needs of belonging, esteem and self-actualization.

SUSTAINABLE DESIGN

As shown in Table 1, a set of three objectives and six principles has now been incorporated into another concept of building performance: "sustainable design."

Table 1

Objectives and Principles of Sustainable Design from the Whole Building Design Guide[11]

OBJECTIVES	PRINCIPLES
1. Avoid resource depletion of energy, water and raw materials.	1. Optimize site potential.
2. Prevent environmental degradation caused by facilities and infrastructure throughout their life cycles.	2. Optimize energy use.
3. Create built environments that are livable, comfortable, safe and productive.	3. Protect and conserve water.
	4. Use environmentally preferred products.
	5. Enhance indoor environmental quality (IEQ).
	6. Optimize operations and maintenance procedures.

These objectives and principles, which promise both outdoor and indoor environmental control, are similar to ASHRAE's definition of high-performance green buildings. They promise a certain quality of performance *through design* without defining the constellation of forcing functions or a set of responses in measurable terms that can be used to evaluate the actual building performance under normal or extraordinary conditions. Moreover, these objectives and principles appear to invert the control priority established by the Maslow Hierarchy of Needs and to exacerbate the risks in promising sustainable building performance. As typically advocated, these objectives and principles tend to focus first on minimizing the impact of building performance on climate change and depletion of natural resources, then on controlling for the health, safety and well-being of the building occupants. Taken to its logical extreme, this apparent inversion would require that buildings not be built or operated. Conversely, if buildings are to function, they must provide for occupant health, safety and well-being; and the physical laws of nature require the use of energy, other natural and human resources, and the necessary discharge of waste products. Therefore, integration of the objectives and principles of sustainable design should focus primarily on developing and using quantitative measures to assure compliance with the Maslow Hierarchy of Needs.

RISK MANAGEMENT

A critically important lesson has been learned during the last two decades. Buildings must be *resilient*: they must perform under normal forcing functions during their entire useful lives, and be prepared to effectively respond during and after the occurrence of extraordinary forcing functions caused by relatively short periods of natural disasters, accidental incidents and intentional events.[12]

The strategies for resilient control during the normal and extraordinary periods should be evaluated and updated through periodic risk assessments of the specific site, which identify the threats (i.e., forcing functions), the vulnerabilities or weaknesses in the building system (i.e., measured responses), and risks that can result. As an example of resilient control, consider the required performance of a building with a critical need to continue its operations during an extraordinary weather event. It must have adequate emergency and redundant electrical power generating equipment (e.g., diesel generators), HVAC capacity, and flexibility of control to provide for occupant health and safety; and it must reliably power the critical operations during the event in addition to re-establishing normal operations rapidly after the event. A flow diagram of this resiliency is shown in Figure 1.

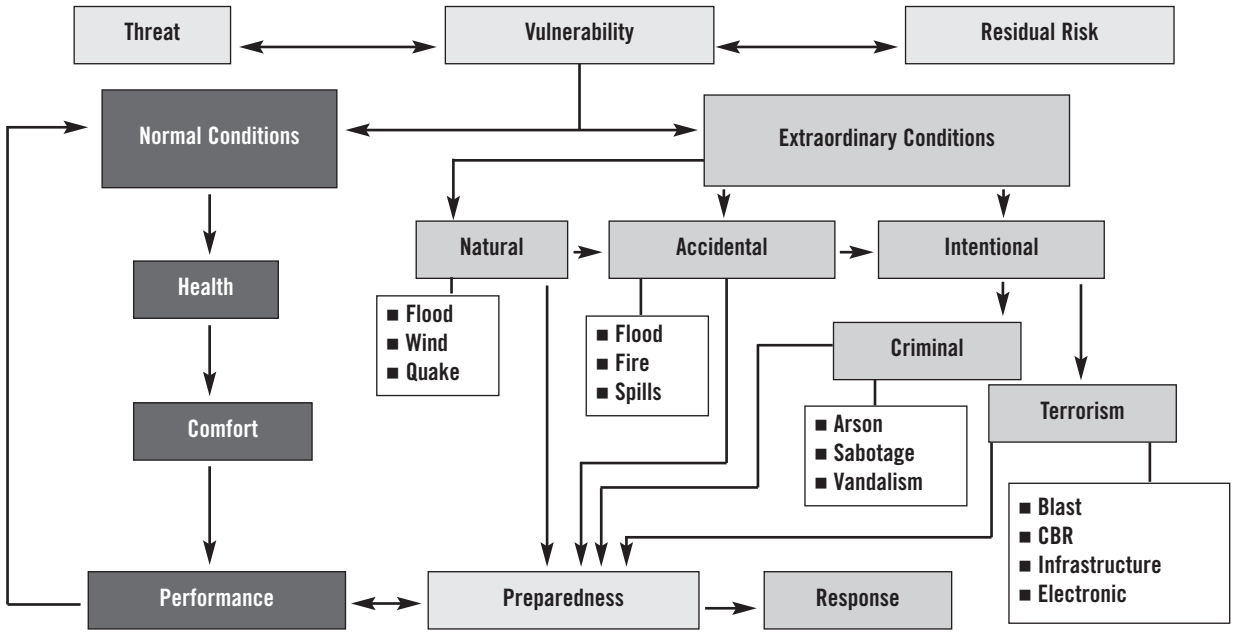
A building is subject to vulnerabilities under normal as well as under extraordinary conditions which may be markedly different. An energy efficient system during normal conditions may prove to have very high vulnerabilities to intentional acts or vice versa. No building can avoid a level of residual risk which remains no matter what the desire to eliminate all risk. Rather, this residual risk needs to be managed. In fact, the resiliency of a building is its capacity to minimize this residual risk so that it can quickly return to its proper functional reason for being.

The concepts of residual risk and resiliency incorporate the Maslow Hierarchy of Needs and the WHO definition of Health while extending the concept of sustainability beyond that shown in Table 1.

- During normal conditions, a set of forcing functions occurs on a regular basis, and control of the measured responses should be sustained within the ranges of expected values for the intended performance of the building.
- During extraordinary conditions, an expanded set of forcing functions occurs for short periods of time (i.e.,

Figure 1

Residual Risks



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threats) that result from natural disasters, accidents and malicious events.

- If the building performance is assured during normal conditions, its preparedness for safe and secure performance during and after extraordinary conditions is likely to be enhanced and the residual risk is likely to be diminished.
- If preparedness of the building performance before, during and after natural disasters (e.g., floods, quakes, fires, winds) is assured to be in compliance with codes and standards for new and existing buildings, the physical means and methods employed are also likely to diminish the risks associated with accidental, criminal or terrorist incidents.
    - If preparedness of the building performance before, during and after accidental incidents (e.g., internal floods, fires, spills) is assured to be in compliance with standards and policies, the physical and social means and methods employed are also likely to diminish the risks associated with criminal incidents.
    - If preparedness of the building performance before, during and after criminal incidents (e.g., arson, sabotage, vandalism) is assured to be in compliance with standards and policies, the physical and social means and methods employed are also likely to diminish the risks associated with terrorist incidents (e.g., blasts, chemical or biological releases, infrastructure attacks, electronic interferences).

BUILDING PERFORMANCE

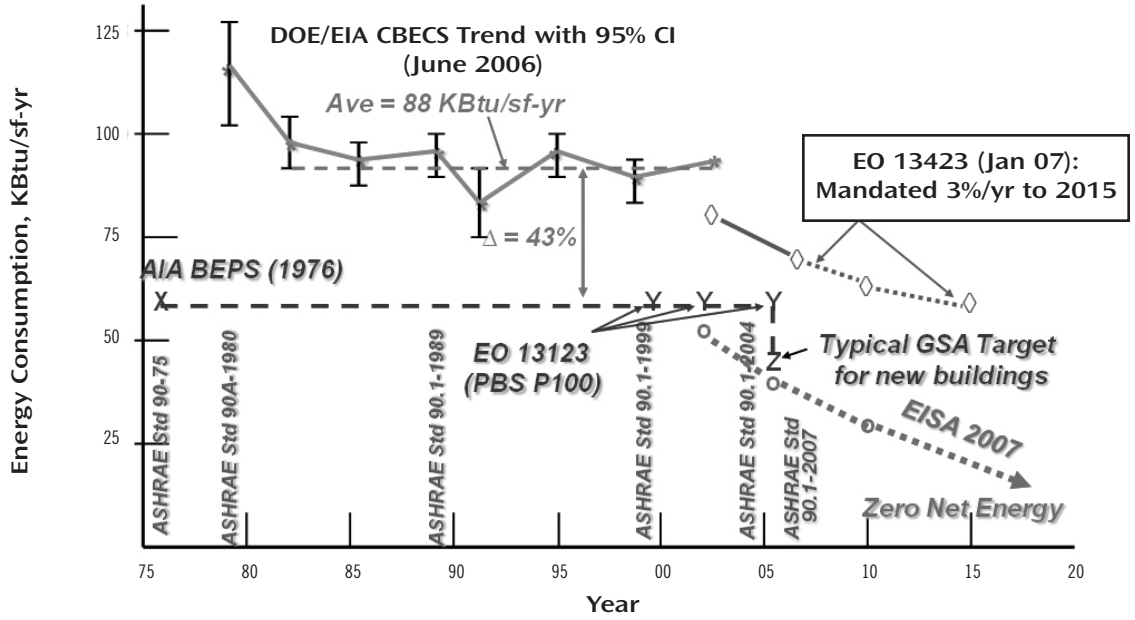
Under this more comprehensive definition of measurable building performance, an owner needs to assess what attributes of the building affect the primary business function. If an important function of the building is for it to be occupied by employees, workers or visitors, the owner should consider how to minimize the residual risk and maximize the resiliency of such a building. Therefore, both the physical and social factors of a building must be addressed to properly fulfill the building's function. In other, rarer cases, either the physical or the social factors will dominate.

ENERGY UTILIZATION

Energy utilization is a consequence of both physical and

Figure 2

Energy Trends and Predictions



Woods, 2008

social factors. When considering energy utilization we should keep this in mind, especially when dealing with policy formulation. According to the Energy Information Agency of the U.S. Department of Energy,[13] approximately 4.7 million commercial and 107 million residential buildings now exist in the U.S. and replacement rate for this building stock has been 2–4 percent per year for the last 20 years. If this rate continues, more than 80 percent of the buildings that will exist in 2030 have already been built. Therefore, the new "energy efficiency" and environmental laws, codes and standards promulgated by government and advocacy groups for new building designs are not likely to have the national and global effects on building inventories that have been promised. Some of the reasons for this dilemma were described by Bezdek[14] at the REI Forum in February 2008 as the Jevons Paradox: "The more efficient we become in using a given resource, the more we consume of that resource."

An example is shown in Figure 2: an analysis of thirty years of Commercial Building Energy Survey (CBECS) data published by the Energy Information Agency of the U.S. Department of Energy (DOE/EIA) revealed that the average Energy Utilization Index (EUI), which is a widely used index for commercial buildings in the U.S., has been statistically flat at 88 kBtu/sf-yr within a 95 percent confidence interval (CI) for the last 25 years.

This average value consistently has been 43 percent higher than the energy goals that have been set since 1975-1976 for new building design by the American Society of Heating Refrigerating, and Air-Conditioning Engineers (ASHRAE Standard 90-75, 90A-1980, 90.1-1999, 90.1-2004, 90.1-2007). These are labeled in Figure 2 along the x-axis by date of standard released. ASHRAE has for many years been advocating for decreased use of energy per its standards but this seems to have had little impact on the 88 kBtu/sf-yr seen in the CBECS data.

The American Institute of Architects has also spent much time trying to attack this problem by participating in the creation and promulgation of various standards to decrease energy consumption for private buildings (Building Performance Standards, BEPS 1976, with a target of 55 kBtu/sf-yr shown in Figure 2), and public buildings (the Facilities Standards for the Public Building Service, U.S. General Services Administration (PBS P 100-2000, 2003 and 2005 setting the same goal of 55 kBtu/sf-yr). Of particular note:

- The Presidential Executive Order 13423, issued in January 2007, now requires, as an unfunded mandate, that the consumption rates of energy and water be reduced by 3 and 2 percent per year, respectively, in each Agency's inventory of buildings until 2015 (upper right quadrant of Figure 2).
- The Energy Independence and Security Act of 2007 (EISA 2007, the decreasingly sloping curve in the right bottom quadrant of Figure 2) now requires 50 percent reductions in energy consumption by 2020 in new building design, compared to those determined by ASHRAE Standard 90.1-2004, and "net-zero" energy consumption by 2030, where "net-zero" energy consumption means that renewable resources must provide at least as much energy as is consumed by the building.

When all these hopeful standards and regulations are superimposed, it is clear that the 88 kBtu/sq-ft average will be exceedingly difficult to change. These results indicate the difficulty that has been experienced in achieving a national impact on energy reduction in buildings. Even more, it indicates the often wishful thinking in much public policy behind the regulatory or legislative enactments. Advocacy decoupled from the actual performance data may increasingly lead to a gap of credibility for public expenditures and subsidies. This would be a very unwelcome outcome.

Moreover, this example does not include trends in building performance with regard to other measured responses such as occupant health, safety and well-being, indoor exposures or system performance.

INDOOR ENVIRONMENTAL QUALITY

Not only has the measured energy utilization in buildings failed to meet the expected goals, but the environmental quality within these buildings has not met expectations. Providing indoor environmental quality (IEQ) is a primary requirement of building performance. IEQ is dependent on both physical and social factors.

Since the important concept of "continuous degradation" of the building stock was introduced in 1988,[15] the percentages of commercial buildings with less than acceptable indoor environmental quality have been reported to exceed 30 percent in both the private and public sectors. In the 1990s, the U.S. General Accountability Office (USGAO) reported that 58 percent of the approximately 100,000 K-12 schools in the U.S. had at least one unsatisfactory environmental condition and 13 percent had more than five unsatisfactory environmental conditions. In 2003, the USGAO added Federal Real Property to their "high risk" category due to poor quality of health and safety conditions.

The 2006 CBECS data also reveal some other attributes of interest:

- Approximately 11 percent of the commercial building stock is government owned, so approximately 89 percent of the commercial building stock is in the private sector.
- The sizes of the commercial buildings in the database ranged from less than 1,000 square feet to more than 2,000,000 square feet:
    - 50 percent of the commercial buildings are smaller than 5,000 square feet;
    - Approximately 75 percent of the commercial buildings are smaller than 10,000 square feet;
    - Fewer than 5 percent of the commercial buildings are larger than 50,000 square feet.
- The employee population is inversely proportional to the number and size of the buildings:
    - Half of all employees occupy the 5 percent of the buildings larger than 50,000 square feet;
    - One quarter of all employees occupy the 75 percent of the buildings smaller than 10,000 square feet.

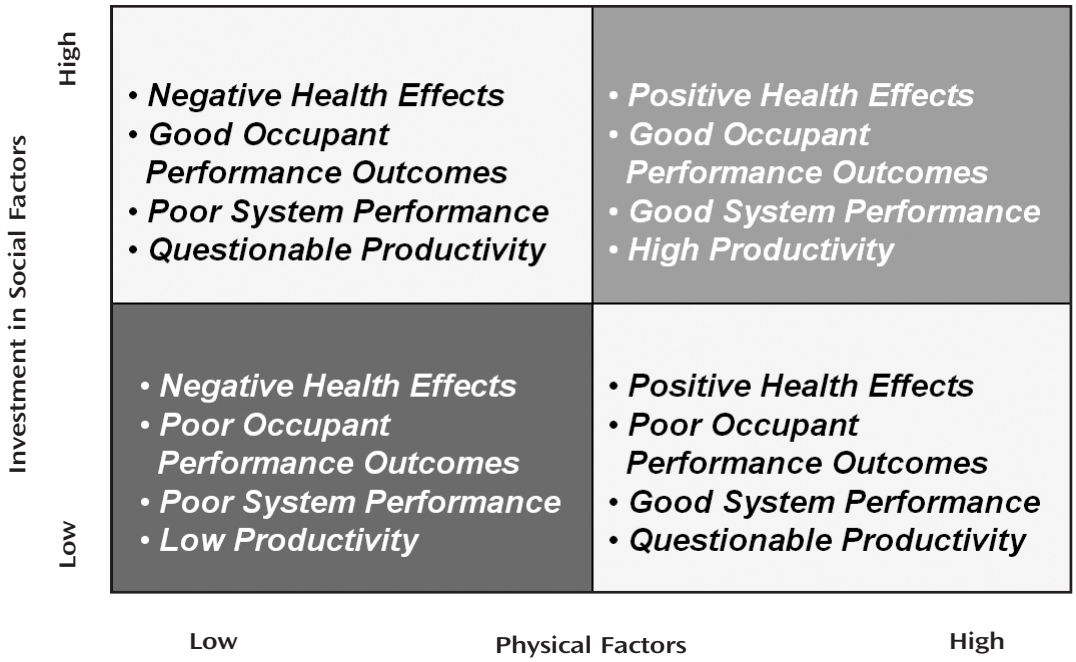
BALANCING THE FACTORS

From a building performance perspective, the data in the examples above present two important questions: First, how important are the physical factors compared to the social and motivational factors in delivering the functionality as set by the primary business goals? Second, how much should be invested in the control of the physical versus the motivational and social factors given the context of the given functional desires? It may be much more important for an owner to do what is necessary to increase his or her productivity than to worry about the energy expenditure if increased productivity has the greater impact on profitability. In the latter example, the owner would want to invest more in credible and measur-

Figure 3

Expected Outcomes

Example of a risk and investment management dilemma that must be solved periodically throughout the life of the building.



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able methods to deal with productivity issues related to the building rather than decreases in energy consumption.

An example of the risk management and investment dilemma that must be resolved periodically throughout the lifetime of the building is shown in Figure 3. If little or much is invested in both the physical and the motivating factors (the lower left and upper right quadrants of Figure 3), the outcomes are obvious. However, if the investment must be limited and non-uniformly distributed among the choices, which set of measurable factors incur the highest risks (i.e., high motivation and low physical performance; or low motivation and high physical performance)?

This dilemma can be illustrated as follows: If a school superintendent has a limited budget of $1,000,000 to invest in the improvement of student performance in a 250,000-square-foot high school of 2,000 students, how much of the investment should be directed to the replacement of three highly talented and motivated teachers who are retiring, and how much should be directed to mold remediation and repair of water leaks in the roof?

- Dilemma 1: Insufficient funding is available to accomplish both objectives, but to accomplish neither is not an option.
- Dilemma 2: If the mold is remediated and the roof leaks fixed but all of the talented and motivated replacement teachers are not hired, the health risks will be reduced but the risks of diminished learning outcomes will be increased.
- Dilemma 3: If the teachers are hired but the mold remediation and roof repairs are not completed, the learning outcomes will not be impaired but the health risks will be increased.
- Dilemma 4: When considering the total impact on the investment, which is more important: to reduce the risk of increased life-time health impairment or to reduce the risk of life-time deficiencies from the

learning outcomes?

To resolve such dilemmas, credible sets of forcing functions and response functions must be objectively defined and quantitatively measured.

RISK AND ACCOUNTABILITY

Risks associated with the unintended consequences and unfulfilled promises of building performance have been the focus in this article. The primary causes of these risks may be lack of measured performance data and the means and methods to collect them. Once credible data become available to the real estate industry, those being held accountable for building performance during both normal and extraordinary conditions will be able to verify that the buildings are quantitatively performing in accordance with the appropriate criteria, which may not yet be developed.

Accountability for the performance of a building is not a new issue, but it has become a nebulous function during design, construction and operations of buildings. It is certainly not a term that is easily found in contracts for these services. A major issue is: for what are the designer, contractor, owner and tenant accountable?

- Designers, contractors and building operators are not currently prepared to evaluate health consequences of their decisions, although professional licensure requires this knowledge to protect the health and safety of the general public.
- Codes and standards seldom address "health" issues, and prescriptive formats of these documents are not consistent with evaluation of health consequences.
- Occupant health may be explicitly excluded from these contracts.
- Occupant health is generally avoided in project documentation.
- Insurance policies often have exclusion clauses on indoor environmental issues and health consequences, or they are very expensive.

As health, safety, security and sustainability have all been integrated into the lexicon of building performance, accountability is likely to be required for each of these factors during each phase of the building's life. As shown in Figure 4, accountability for building performance should be considered as a cycle.[16]

This cycle outlines a protocol that can be used to assure the performance of a building and its systems from planning and design through construction and operations. This protocol focuses on the interception of continuous degradation through building diagnostics, and defines the concept of "continuous accountability:"

1. Through the process of building diagnostics, the rate of degradation in building performance (e.g., occupant complaints, exposure deficiencies, system imbalances and vulnerabilities, energy and economic deficiencies) can be detected and intercepted to protect occupants and assets.
2. Cost-effective interventions can then be identified, designed and implemented for normal conditions, and emergency responses can be implemented for extraordinary incidents.
3. The interventions go through a process of building commissioning to assure proper installation and operation using building diagnostics procedures, to assure that the healthy building status has been regained.
4. An "accountable person" provides the continuity to assure the success of this process.

For this cycle to be effective, the accountable person must be:[17]

- *explicitly identified* for each phase in the building's life;
- *empowered* with authority to assure building performance; and
- *educated and trained* to assure adequate building performance and occupant well-being.

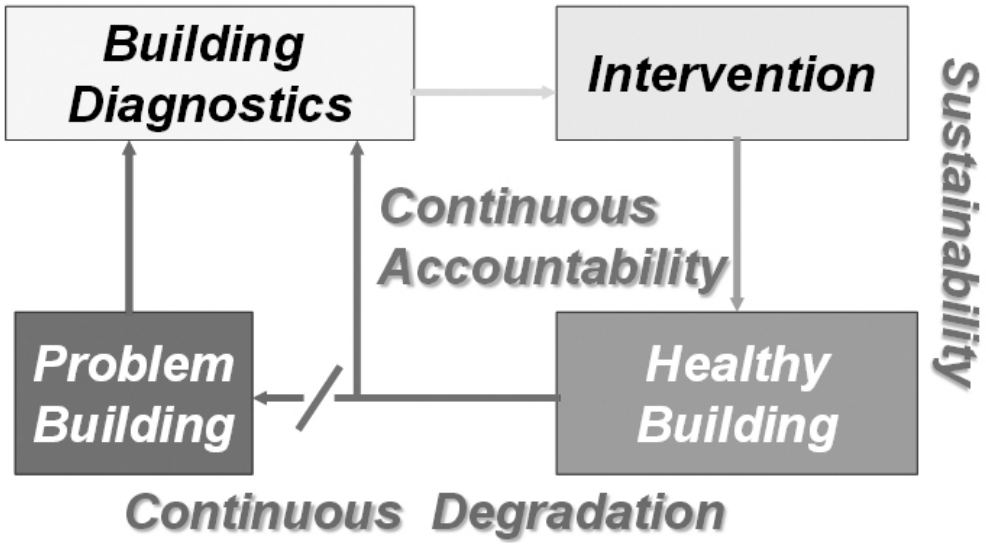
CONCLUSIONS

Building performance is a set of facts and not just promises. If the promises are achieved and verified through measurement, beneficial consequences will result and risks will be managed. However, if the promises are not achieved, adverse consequences are likely to lead to increased risks to the occupants and tenants, building owners, designers and contractors; and to the larger interests of national security and climate change.

A primary means to assure intended building performance is through the process of "continuous accountability." This process is something very common in successful businesses. Only by measuring and verifying the outcomes of particular resource investment strategies over appropriate time periods can a company monitor

Figure 4

Concept of Continuous Accountability



Woods, 2008

and improve performance. One might even say this is the only way to determine on a periodic basis the "health of the business." The building diagnostics approach simply transfers this thinking about a healthy business and applies it to the company's inventory of building(s).

The bottom line is that verifiable assurance of the promised building performance allows the owner to determine if he or she made a good investment. ■

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FOCUS ON GREEN BUILDING

Sustainable Buildings and the Surety

BY BRYAN M. SEIFERT, ESQ.

ONE OF THE MORE VITAL, THOUGH OFTEN HIDDEN, types of risk transfer mechanisms on many construction projects is the surety. In fact, sureties act as a basic backstop against the possibility that a project will get derailed due to the inability of a contractor or subcontractor to fulfill the terms of the contract with the owner or higher-tier contractors. Sureties allow the owner to defray his or her risk for failure of contract performance and the concomitant delays and financial difficulties that ensue. To manage risk, large and complex projects require the services that a surety bonding regime can offer, while the largest projects, including infrastructure projects, cannot even be contemplated without adequate bonding.

Because surety bonds function to guarantee the fulfillment of contract terms, they play an important role in guaranteeing building performance. Their role is increasingly implicated in the sustainable building process through either the inclusion of contract provisions for green building rating system certifications or specific attributes of building performance reasonably inferable from the contract documents to deliver sustainability. A surety is usually a large financial institution that issues a bond to assure a set of contractual obligations. In the construction context, these are most often seen as bonds to assure the performance of a contractor or subcontractor—so-called "performance bonds"—or bonds to assure the proper and timely payment of lower-tier subcontractors to prevent work delays—so-called "payment bonds." To manage these types of performance and payment risks, almost all governmental projects on the federal, state and municipal level statutorily require the use of surety bonds as a result of the passage of the Federal Miller Act and the Little Miller Acts adopted by the states.

A surety bond is a three-party contract issued by a surety company in connection with a construction project. The three parties to the bond are the surety company, the owner and the contractor. The bond, in part, guarantees to the owner that the contractor will perform the construction project per the requirements of the contract. If the contractor fails to perform the contract, the owner may call upon the surety to step in and complete the project or correct project deficiencies. This usually occurs when the contractor does not meet the contractual requirements, performs defective work or does not have the financial wherewithal to complete a project. There are no requirements for surety bonds on private projects; however, savvy owners often require a private works contractor to procure a surety bond. This allows the owner to displace much of the financial risk onto the surety company if the contractor fails to perform.

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A LEGISLATIVE EXAMPLE AFFECTING THE SURETY INDUSTRY

Sustainable building rating systems and benchmarks have been legislated in numerous states, municipalities and counties throughout the United States. Many federal agencies also require the use of sustainable building rating systems. As sustainable building becomes fixed into the statutory and regulatory framework, the surety's role is increasingly implicated by virtue of the fact that surety bonds are required on almost all federal, state and municipal projects. One example of legislative activity that has implicated the surety is the District of Columbia Green Building Act of 2006, which mandates the use of a surety product that does not currently exist in the marketplace.

The D.C. Act requires certain public and private projects to meet the U. S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification. The D.C. Act also requires that all applicants for construction of privately owned buildings governed by the Act provide a performance bond that is due and payable prior to receipt of a certificate of occupancy. The D.C. Act sets the penal sum[1] of the performance bond at an arbitrary rate of between two and four percent of the total construction price depending on the square footage of the building. The Act requires that the performance bond shall be forfeited to the District and deposited in the District's Green Building Fund if the building fails to meet the verification requirements of the Act.

While performance bond requirements of the D.C. Act may appear benign to the casual observer, their implications may be severe for the surety industry. These problems include: 1) assumptions and vague language by the drafters which suggest that LEED is an accredited standard, possibly resulting in the interpretation of LEED as a performance standard as opposed to a prescriptive requirement; 2) failing to define the parties to the bond (a fatal error in any contract); 3) misunderstanding sustainable building rating systems that require input and control of several parties to a construction project that may or may not be in privity of contract or under the control of the contractor; 4) automatic deposit of the penal sum of the bond into a green building fund held by the District without a determination of liability or certification; and 5) determination of the forfeiture of the penal sum of the bond by the same agency responsible for verification under the Act.

From a construction risk management perspective, these problems raise several questions. How can a surety, as secondary obligor, be required to guarantee the obligation of building certification when that obligation does not lie in the hands of any one party? What effect will these obligations have upon the many parties implicated by the bond? More important, is it equitable to legislate such a performance bond requirement for automatic deposit by a surety into a green building fund held by a District administrative agency that has the authority to determine compliance with the Act's requirements? Finally, will the District agency actually track the performance of the buildings in a meaningful manner, and if they are non-performing, what types of recourse are available to the District and the owner or developers?

This type of legislation involves a fundamental misunderstanding of the marketplace, the type of products available in the insurance and surety industry and how those products respond to today's construction needs. Performance bonds typically guarantee the performance of a quantifiable objective. Rather than legislate a performance bond to guarantee a quantifiable goal based on an objective standard for which the bond is written, the District has chosen to legislate a particular prescriptive rating system with attendant unknown risks. The surety product will more likely end up contributing to the District's green building fund and not the sustainable performance objectives of the District's projects.

Owners, stakeholders, contractors, risk managers, insurers and sureties must be keenly aware of the flurry of legislative activity and its implications for their interests. Much of the recent green building legislation is a result of advocacy for intangible outcomes with little analysis given to the overall performance of the public asset and little consideration for the industries that support and sustain the construction process such as insurers and sureties. The D.C. Act is just one of many examples of legislative activity that may have profound and unknown affects on these industries.

TRADITIONAL RISK DRIVERS

While the D.C. Act is an unusual example of a risk that may affect a surety or insurer, there are also more common risk drivers affecting the surety industry. Right or wrong, public owners may likely look to the surety as performance guarantor of sustainable building requirements or benchmarks in the event of the bonded contractor's default or some subsequent determination of

non-performance. To the extent a bonded contractor defaults under his or her performance obligations on a project, such default will be exacerbated by the ill-defined performance standards of sustainable buildings. While the surety's performance liability for failed sustainable building standards and benchmarks has yet to be decided through litigation, the surety's representative should have a working knowledge of the major issues of sustainable buildings in order to address the owner's expectations.

In the surety industry, one of the greatest risk drivers that results in increased claim activity is mismatched expectations: a difference in what the owner expected to receive as a final product and what was actually delivered by the contractor. The owner and the contractor should be very clear in defining sustainability expectations, benchmarks and prescriptive requirements in the contract. This may require a collaborative effort at the outset of the project between the owner and the contractor to determine the reasons for the owner's decision to construct a sustainable building.

If the owner, for example, is primarily concerned about the marketing of the building as achieving a specific sustainable rating or complying with certain legislative rating requirements, the building's failure to meet that rating may result in claims for lost profits for building stakeholders and investors or result in statutory legal liability. Where the contract plans and specifications may incorporate rating requirements, the contractor and its surety should be careful to determine which requirements the contractor will be accountable for and which requirements fall outside the scope of the contractor's work and control.

If, however, the project owner is expecting that the use of a particular rating system will increase occupant health and productivity based on unfounded or questionable claims, the contractor should be careful that no warranties are being made with respect to those claims. Where the project owner is representing to the public and fully expects to obtain a specified level of energy savings through increased net operating income and reduced energy costs, the contractor must actively protect against unknowingly guaranteeing these performance attributes.

Public works contractors face an increasingly high demand for "sustainability" experience as federal agencies continue to incorporate sustainable building standards into federal works and as states continue to legislatively mandate sustainable building rating systems. Before embarking on a sustainable building project, it is extremely important that a contractor and its surety specify exactly what the owner is contracting for, define the responsibility of each party to the sustainable building project and determine the owner's goals—prescriptive, aspirational or otherwise—relative to the contractual requirements.

GUARANTEEING SUSTAINABLE BUILDING PERFORMANCE

Some insurers have responded to sustainability in today's market. One large insurer has issued a certified green building coverage for losses sustained to real property and assistance in the redevelopment of real property to green certification standards. The policy covers costs related to the redevelopment of those standards. Additionally, an endorsement to that green coverage provides green certification coverage for upgrades to certain business personal property and real property. Another major insurer has created a program that provides a discount of up to 10 percent on premiums for new Pollution Legal Liability policies for properties certified under LEED.

The thought process underlying these types of policies is that buildings built to green building rating systems necessarily decrease risk. Insurers want to encourage this activity (for public perception reasons, to gain new market share and to increase premium earnings) so they offer policies that provide certain premium discounts or reinforce the use of certain rating systems. These types of policies may have their use in the building industry—undoubtedly they have been successful from a marketing perspective—yet it is not clear that these rating systems reduce risk or are driven by the goal of obtaining quantifiable performance standards, increased efficiency and increased operating income through reduced energy use. While marketing has its place, an important goal of sustainable building and risk management, in part, is to increase overall efficiency, understand and mitigate attendant risks and provide a high-performance building asset.

It may be helpful for owners and their stakeholders to rethink their sustainability objectives and seek out contractual, risk transfer and project delivery options that ensure performance outcomes rather than adopting current rating systems. Incentive-based contracting using a design-build delivery system and energy performance contracting through energy service companies (ESCOs) have been used for public projects for many years. ESCOs are an important option to note since many states already have statutes governing this type of work to ensure that

public works deliver quantifiable energy savings. In fact, many of these statutes require energy service companies to obtain surety performance bonds linked to the energy conservation measures implemented in an amount equal to the guaranteed measured and verified annual savings set forth in the underlying agreement. Other project delivery options also exist, and in all cases proper measurement and verification procedures combined with appropriate risk transfer mechanisms play a pivotal role. Such methods of establishing the benchmarks and recourse for failure should reduce the potential for mismatched expectations and allows the necessary underwriting confidence for a surety.

It is somewhat puzzling why policymakers and the building industry favor legislating building rating systems as opposed to contractually specifying performance standards. Performance contracting, for example, has been used successfully in the past, with a design-build delivery system for new construction. In this case the owner contracts with the design-builder to design and build a high-performance building. At the outset and as specified in the performance contract, the owner and design-builder set certain quantifiable sustainable performance standards. This also allows the greatest flexibility to the owner as to what areas of performance are sought depending on a full assessment of the context.

A computer model of the baseline building performance is created subsequent to a detailed building audit, and the pertinent contractually specified energy efficiency measures and targets are put into place. It is also important to incorporate into the performance contract a truly independent entity that will perform the measurement and verification. Measurement and verification are critical as are the protocols to verify performance since measurement and verification determine whether the design-builder has met the contractual obligations under the design-build performance contract.

Once the baseline and contractually specified level of energy efficiency are set along with the proper protocols for measurement and verification, an incentive could be incorporated into the design-build performance contract. To the extent the design-builder exceeds the contractually specified level of energy efficiency, the design-builder could receive from the owner a pro rata share of the energy savings up to a certain limit. The contrary also holds true. If the design-builder falls below a contractually specified level of energy efficiency, the design-builder could be penalized at a pro rata share and may be deemed to have breached its contractual obligations.

This basic illustration suggests that there are project delivery systems that provide for obtaining real and quantifiable sustainable building attributes which are tied to the performance outcome of the building. Incentive-based performance contracting with a design-build delivery system provides several advantages over legislating green building rating systems: 1) it promotes better integration between the project stakeholders; 2) it provides an incentive to the design-builders by giving them a stake in the ultimate performance outcome of the project; 3) it requires the design-builders to design and build efficiently without incorporating generic assumptions that may exist in certain rating systems and that do not further sustainability goals; 4) it promotes incentives for proper commissioning; 5) it requires clearly stated goals; and 6) it provides for accountability in the event a contractually specified energy performance standard is not obtained.

While incentive-based contracting for new construction is somewhat rare despite its advantages, energy performance contracting in existing buildings is quite common. In energy performance contracts, an energy service company (or ESCO, as noted above) will identify and evaluate energy savings opportunities in existing buildings and then recommend and, in many cases, perform existing building improvements that will be paid for by the energy savings from the improvements.[2]

ESCOs are primarily instruments for financing building improvements and can sometimes be structured as "off-the balance sheet." It is crucial to remember that ESCOs are primarily driven by generating measurable energy savings because these provide the basis for a positive business outcome for the financing activity. Because of this, much of the due diligence for ESCO projects is to ascertain that it makes economic sense.

The ESCO will guarantee the energy savings to the owner and finance the building improvements. The owner gains building improvements that decrease operating costs, increase operating income and increase the energy efficiency of the building. The ESCO shares in the profit of those improvements through the actual savings as benchmarked to the original building energy consumption. Though ESCOs engage in performance contracting as the linchpin of their services, it is the financing that is often the most attractive attribute for owners. In addition

ESCOs generally perform retrofit work, whereas incentive-based performance contracting is for new construction and often requires a more savvy owner and contractor to defray the risks associated with failure. For this reason, performance contracting and its more specific variant, ESCOs, are often self-insured entities.

In the context of the surety and sustainable building, ESCOs are important to note because many states already have statutes that govern this type of work to ensure quantifiable energy savings for existing public works. Many of those same statutes require the energy service contractor to obtain a surety performance bond relating to the installation of energy conservation measures in an amount equal to the guaranteed measured and verified annual savings set forth in the building program. That is, a surety bond is used to provide a secondary guarantee of a contractually specified level of energy savings based on an objective and quantified performance standard.

In contrast to the insurance policies mentioned above, which provide premium discounts for the use of rating systems or cover the additional costs for business personal property and real property to utilize rating systems, a specialized surety product could be created to guarantee the energy savings. While an insurance policy is a two-party agreement between the insurer and the insured, a surety bond is a three-party agreement between the owner, the contractor and the surety company. If a specialized surety bond were issued to guarantee the contractor's contractual requirement to obtain a specified level of energy savings pegged to appropriate independent measurement and verification, the owner could call on the surety company to guarantee a shortfall or provide positive incentives for better-than-expected performance.

This guarantee could be monetary or the surety bond could be written to require the surety to overtake and complete the improvements to ensure the energy savings. The second option may be more valuable to the owner as the monetary value of shortfalls will likely be less than the actual cost to correct improvements to ensure energy savings.

This type of specialized surety product may also be more attractive from an underwriting perspective. If a surety were to issue a bond to guarantee the contractually specified level of energy efficiency for incentive-based design-build performance contracts, it would be clear contractually who is accountable for the energy savings (the design-builder) and what the value of the savings is (specified in the contract). The surety, therefore, could appropriately underwrite its risk, evaluate its exposure, and properly price the product in the marketplace. This type of specialized surety product would be more logical than the surety product required under the D.C. Act as it would be tied to the sustainable building performance objectives and not to an arbitrary square footage of the building.

Owners and their stakeholders may no longer have a choice due to increased or often confused legislative activity and may in fact be unfamiliar with incentive-based design-build performance contracting. Nevertheless, legislators could begin to think anew about legislating sustainability. There are many organizations throughout the U.S. that have developed accredited performance standards for sustainable buildings. These standards could be incorporated into legislation as performance standards and incorporated into public contracts whereby independent and objective third-party verifiers could measure the performance of sustainable buildings. A performance bond could be underwritten to guarantee the performance standards similar to the energy performance contract bond discussed earlier. Such legislation would not favor one particular certification system over another, would set real and quantifiable performance standards for sustainability attributes, and ultimately would guarantee performance standards of public assets through the use of a surety product.

CONCLUSION

The flurry of activity surrounding sustainability, especially as it relates to legislation and claims about the benefits of building green, cannot fail to include the industries that support the construction in this country. These industries, such as insurance and sureties, must be able to account for their risk, and provide products that support the building industry's sustainable building goals *and* that can perform in the marketplace. This requires an objective examination of sustainability issues. It also requires thoughtful and creative risk management tools that view sustainable buildings as high-performance building assets with objective and quantifiable performance criteria. ■

ENDNOTES

1. The penal sum of the bond is the dollar value of the bond and is the extent of the surety's liability—on most construction projects the penal sum of the bond is the value of the contract price. See Robert Cushman and James J. Meyers, *Construction Law Handbook*, § 35.04 F(6), Aspen Publishers, 1999.

2. See for a recent history of the development of ESCOs in the U.S., "A Survey of the U.S. ESCO Industry: Market Growth and Development from 2000 to 2006," Nicole Hopper, Charles Goldman, Donald Gilligan, Terry Singer and Dave Birr, Ernest Orlando Lawrence Berkeley National Laboratory (LBL 62679), Berkeley, 2007; see also for a more detailed exploration of the specifics, *A Guide to Energy Services Companies*, Cary Bullock and George Caraghiaur, The Fairmont Press, Lilburn, Ga., 2001, and *The Handbook of Financing Energy Projects*, Albert Thurmann and Eric Woodroof, The Fairmont Press, Lilburn, Ga., 2005.

FOCUS ON GREEN BUILDING

Green Building Representations and the Emerging Potential for Securities Fraud Liability

BY BRIAN D. ANDERSON, ESQ.

INTRODUCTION

In the past ten years, the notion of "green" or high-performance building has moved from an isolated concept discussed among small groups of idealists to become a key element of any credible discussion regarding public or private investment in the built world.

However, that growth has been accompanied by a penumbra of oft-repeated but misunderstood or exaggerated claims regarding green building practices and certification. Unfortunately, it appears that some of those claims are being made by public companies in their securities disclosures.

In order to understand how this has occurred, it is important to understand the fervent growth of green building as a kind of social "movement"[1] in the United States. In part due to the threat of global warming and the precipitous rise of fuel costs, the green building movement has gained considerable urgency and legions of committed followers.

While environmental concerns and energy costs both factor into the growth of green building, much of the credit is due to the United States Green Building Council (USGBC) and the development and marketing of its Leadership in Energy and Environmental Design (LEED®) green building certification products. Where similar movements to encourage environmental practices (i.e, organic foods) have been mired in competing and misunderstood definitions or certification regimes, LEED has managed to succeed. Although rating systems exist that are similar to LEED, the USGBC has virtually cornered the market on the rating of green commercial buildings.

USGBC's cornering of the market arose from four fundamental issues: 1) LEED provides a clear definition of green that references existing, third-party standards, codes and calculation methods; 2) LEED provides an easily understood points system that seems to appeal to the competitive nature in all of us; 3) the USGBC rolled out LEED by first getting a foothold of acceptance among key federal government agencies; and 4) increasing levels of LEED certification are awarded on an appealing, highly-

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marketable Olympic-medal-like recognition ranging from Certified to Silver, Gold, and finally, Platinum.

The success of the USGBC is reflected in the growth of its membership and in the number of buildings registered with the USGBC for potential LEED certification. Over the past five years, the non-profit USGBC has doubled its membership to more than 16,000.[2] At about the same time, commercial LEED registered projects have grown from approximately 2,000 to now more than 13,000 nationwide.[3]

Just as astonishing is the success of the USGBC's annual Greenbuild conference (recently purchased by McGraw-Hill) where the number of attendees last year (22,835[4]) was more than six times the number in attendance at the inaugural 2002 conference.[5] This year's Greenbuild, set for November 19 in Boston, will feature Nobel Peace laureate Archbishop Desmond Tutu as its keynote speaker.

LEED's popularity has not escaped the attention of lawmakers, who have written the LEED point system into various tax[6], building[7] and zoning[8] codes, and even into settlement orders in environmental litigation at nearly every level of government.[9] Whether or not this was the design of LEED's progenitors, what started as an attempt to add a set of environmental options to a set of building practices and materials has become a national and international phenomenon.[10]

While its current LEED products have caught on around the world, the USGBC continues to make changes to them. At present, the USGBC offers nine LEED products. They are: New Construction & Major Renovations, Existing Buildings: Operations & Maintenance, Commercial Interiors, Core & Shell, Schools, Retail, Healthcare, Homes, and Neighborhood Development.[11]

In addition to developing LEED products, the USGBC sells educational materials and seminars, and until recently, administered an accreditation program for design professionals and others (including lawyers) interested in earning the LEED-Accredited Professional (LEED-AP) designation in the application of LEED standards. As of September 2008, the USGBC claims to have accredited 60,000 LEED-APs.[12] The USGBC also certifies projects as LEED-compliant by obtaining written certifications from project architects stating that design elements meet LEED requirements. Beginning in 2009, the certification process will move to the Green Building Certification Institute, a 501c6 non-profit organization established by the USGBC. The following certification organizations will work with the new GBCI:

- ABS Quality Evaluations, Inc. (http://www.abs-qe.com)
- BSI Management Systems America, Inc. (http://www.bsi-global.com)
- Bureau Veritas North America, Inc. (http://www.us.bureauveritas.com)
- DNV Certification (http://www.dnvcert.com)
- Intertek (www.intertek-sc.com)
- KEMA-Registered Quality, Inc. (http://www.kema.com)
- Lloyd's Register Quality Assurance Inc. (www.lrqausa.com)
- NSF-International Strategic Registrations (http://www.nsf.org)
- SRI Quality System Registrar, Inc. (http://www.sri-i.com)
- Underwriters Laboratories-DQS Inc. (http://www.ul.com/mss)

A number of the largest public corporations, investment funds and public institutions in the U.S. have begun to certify their buildings with the USGBC under LEED.[13] This trend appears ready to increase dramatically as the USGBC unveils its portfolio certification program, which enables an owner to simultaneously certify its entire building stock. Currently in pilot form with the USGBC, the portfolio program includes 40 participating companies and institutions and covers 1,700 buildings and approximately 135 million square feet of building space. Pilot participants include institutional investors, financial institutions, hoteliers, retailers, universities and public corporations.

In July 2008, Office Depot joined a number of other retailers in opening its first LEED-prototype certified store in Austin, Texas.[14] According the USGBC, "...the most aggressive at pursuing green building..." appears to be Kohl's Department Stores, which last November announced that it would aim to obtain "...LEED certification for every store to break ground in 2008—or more than 80 locations."[15] Other portfolio program participants include Wal-Mart, Starbucks, McDonald's, Target, Home Depot, REI and Whole Foods.[16]

FEDERAL SECURITIES LAWS

The Securities Act of 1933 ('33 Act) was enacted by the

U.S. Congress as a means to restore trust in the U.S. financial system in the wake of the stock market crash of 1929 and the Great Depression. In general, it requires registration with the U.S. Securities and Exchange Commission (SEC) of any securities offered to the public. The registration process requires that the offeror provide the Commission with detailed information on the company, its management, its proposed use of funds raised, and its financial statements. Registration statements and prospectuses become available to the public shortly after filing via the Commission's online EDGAR database.

Whereas the '33 Act governs the primary market, the Securities Exchange Act of 1934 ('34 Act) targets the secondary market, requiring, among other things, ongoing disclosures by public companies to the SEC. Registered companies and those with more than $10 million in assets whose securities are held by more than 500 owners must file annual and other periodic reports. These reports are also available to the public through the SEC's online EDGAR database.

Both the '33 Act and the '34 Act were intended to provide "shareholders and [the] marketplace with sufficient information to make relevant decisions and to be apprised of significant developments."[17] Both Acts also prohibit manipulative and deceptive practices and provide the SEC with broad powers to punish any attempt to manipulate the market.

As described in the '33 Act and '34 Act and subsequent legislation, the SEC plays a magisterial role in identifying and enforcing the civil and criminal provisions of the '33 Act and '34 Act barring fraudulent practices. The agency scrutinizes, among other things, registration statements for newly offered securities, annual and quarterly filings (Forms 10-K and 10-Q), proxy materials sent to shareholders before an annual meeting, and annual reports to shareholders. The SEC also has the authority to seek an injunction prohibiting further violations, require an audit or commence ongoing supervisory arrangements. In addition, the SEC can seek civil monetary penalties or the return of illegal profits.

Private securities litigation also plays a central and often controversial role in enforcing the anti-fraud provisions of the securities laws. According to a report released by Cornerstone Research in cooperation with Stanford Law School's Securities Class Action Clearinghouse, 217 securities class actions were filed in the 12 months ending June 2008.[18]

In pursuing allegedly fraudulent activity, the SEC and shareholders commonly rely upon Section 10b of the '34 Act and Rule 10b-5 promulgated under the '34 Act. Rule 10b-5, breathtaking in its unqualified breadth and simplicity, makes it illegal to:

> ". . .by the use of any means or instrumentality of interstate commerce. . . employ any device, scheme, or artifice to defraud. . . [or] make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or to engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security."

In short, anybody who uses a deceptive device or makes a false statement or omission of material fact in connection with the purchase or sale of securities may be criminally or civilly liable under Rule 10b-5.[19] Since the enactment of Rule 10b-5, there have been myriad court decisions and legislative enactments and Supreme Court decisions regarding the plaintiff's burdens of Rule10b-5, most aimed at making it harder for a plaintiff to initiate suit and thus reducing the burden of class action suits on public companies.[20]

To succeed on a civil claim for securities fraud under Rule 10b-5, a plaintiff must show that the defendant made (1) a misstatement or omission (2) of material fact (3) with knowledge (4) in connection with the purchase or the sale of a security (5) upon which the plaintiff reasonably relied, and (6) that the plaintiff's reliance proximately caused his or her injury.

Criminal prosecution under section 10(b) of the '34 Act and Rule 10b-5 does require proof of elements similar to those required to maintain a Rule 10b-5 civil action. In order for criminal liability to attach, however, there must be a showing that the defendant acted "willfully" in violating the federal securities laws.[21]

Section 11 of the '33 Act provides additional targets for shareholders who have purchased a security in reliance on a company's false or misleading statements contained in its initial registration statement. Under this provision, any person who purchased that company's securities may sue: 1) every person who signed the registration statement; 2) every director of the company; 3) every accountant, engineer, appraiser or any other person whose profession

gives authority to a statement made by him and who has prepared or certified any part of the registration statement; and 4) every underwriter of the security. The plaintiff must show that he or she relied upon the false or misleading statement but need not prove that he actually read the registration statement. Other provisions of the securities laws provide mechanisms to sue persons in positions of authority over anyone liable under Section 11.[22]

Securities class actions can result in costly settlements. The average settlement paid to resolve a shareholder class action suit during 2002–2007 was $24.4 million. The average rose to a peak of $33.2 million in 2007. Though lower than the average settlement, the median settlement increased to a new high in 2007 of nearly $10 million.[23]

PENUMBRA OF EXAGGERATED CLAIMS

There is some dispute over a set of oft-repeated claims regarding the benefits of green buildings and LEED certification. Those claims commonly assert that LEED-certified buildings yield greater occupant health and productivity, save more energy, use less water, achieve higher lease-up rates, produce greater higher overall valuation or are cost-neutral compared to comparable buildings.

Unfortunately, there is considerable controversy and little dependable data surrounding each of these claims. In fact, some authorities have asserted that, for example, LEED-certified buildings actually consume more energy than comparable buildings.[24] However, it is not the intent of this paper to evaluate the merits of such performance claims but only to point out that such controversy exists.

Many of the extraordinary claims regarding LEED and the nature of LEED-certified buildings seem to result from a misunderstanding of the way LEED actually works. Though the uninitiated might consider LEED to be strictly synonymous with low energy/water use and high energy/water efficiency, this is not the case. To obtain certification under the point system for LEED for New Construction, for example, there are 28 possible points for indoor environmental quality, materials and resources, and only 22 possible points for water and energy efficiency.

Moreover, many observers fail to understand that the USGBC does not conduct site investigations, that LEED does not require buildings to actually perform as promised as a condition of certification, and that LEED does not provide a comprehensive scientific basis or overarching objective (e.g., a net carbon footprint reduction) justifying its allocation of points. Also, because each project owner or architect can independently select the points they wish to pursue on a particular project (as long as they achieve certain required points), applicable green features can vary greatly from one LEED-certified project to another, making it extremely difficult to defend any generalized statements or comparisons regarding the features or performance of LEED-certified buildings.[25]

As discussed above, misstatements made in connection with the sale of securities can trigger the potential for substantial liability under the anti-fraud provisions of federal securities laws. Fear of such liabilities has taught securities lawyers to strive for extreme caution and accuracy in connection with any disclosure provided to the SEC. However, a recent review of disclosures filed with respect to LEED and green building reveals some evidence of a lack of such caution and accuracy regarding the mechanics of and terminology associated with green buildings and LEED.

SAMPLE DISCLOSURES AND ANALYSIS

A search on the SEC EDGAR full-text searchable database (containing records from the past four years only) using the terms "LEED" and "Green Building" yielded 194 documents. One of those documents, a company's 10-K filing, contained the following disclosure:

> The Company is dedicated to excellence, leadership, and stewardship in matters of protecting the environment and communities in which the Company has operations. Reinforcing the Company's commitment to the environment, five of the Company's showrooms have been designed under the guidelines of the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) for Commercial Interiors program. The Company believes that continued compliance with foreign, federal, state, and local laws and regulations which have been enacted relating to the protection of the environment will not have a material effect on its capital expenditures, earnings or competitive position. Management believes capital expenditures for environmental control equipment during the two fiscal years ending June 30, 2010, will not represent a material portion of total capital expenditures during those years.[26]

This disclosure states that the Company's showrooms have been "designed under the guidelines of the USGBC." Unfortunately, LEED does not provide guidelines per se, but is a checklist of building materials and practices.

Though unlikely, the referenced "guidelines" could conceivably refer to points awarded under LEED-CI Credit 3.2 in exchange for providing bicycle storage and changing rooms. In addition, no reference is made to an actual attempt to certify the showrooms. Arguably, and depending on the facts involved, this disclosure could give the average investor the potentially misleading impression that the company is taking dramatic strides to position itself in an emerging green economy.

Another disclosure, a 10-A registration form, discovered in the above-described search of the EDGAR site contained the following:

> Receiving LEED certification can provide building project owners with a number of benefits, including:
>
> higher lease rates;
>
> enhanced resale values;
>
> potential federal, state and local tax credits and incentives; and
>
> the ability to offer financial benefits to tenants, such as operating cost savings, improved worker productivity and health, and insurance and risk management benefits.[27]

As discussed above, the above claims are often repeated but are actually subject to considerable debate. This statement presents the clearest example of a potentially misleading statement upon which a shareholder could rely in deciding to purchase the security in question and later bring a securities fraud suit if the investment soured.

Another disclosure, an S-11 registration form for a REIT, discovered in the above-described search of the EDGAR site contained the following:

> In connection with our assessment and selection of investment partners, property managers, development managers and other service providers, we will consider their experience and reputation in the areas of environmental sustainability, including experience in the development and operation of buildings certified under the LEED (Leadership in Energy and Environmental Design) Green Building Rating System promulgated by the U.S. Green Building Counsel. The Investment Advisor will evaluate the sustainability of a prospective investment property by assessing its ENERGY STAR® score, its preliminary LEED score, and sustainability measures that have been or can be implemented, such as recycling, water conservation and green cleaning methods.[28]

This statement seems to suggest that knowledge of LEED is an effective tool in assessing and selecting investment partners, property managers and development managers. In addition, this statement appears to suggest that a "preliminary LEED score" (as determined by an unnamed person) is a meaningful measure of the desirability of an investment property. Again, claims related to the energy performance of LEED-certified buildings are subject to an ongoing debate, and LEED is not designed with energy performance as its primary objective.

Another disclosure, a 10-K annual report, discovered in the above-described search of the Commission's EDGAR site contained the following:

> In February 2008, we signed a development agreement for our first "solar community" project, a 47-unit condominium project co-sited with a Whole Foods store and other mixed retail outlets in San Diego, California. The project is a LEED-certified "green" development scheduled for construction commencing during the summer of 2008.[29]

This disclosure appears to state that the project has been certified but that construction has not yet begun. Ordinarily, LEED projects are not certified prior to construction. This appears to be a misstatement of fact based on a misunderstanding of the mechanics of LEED certification.

CONCLUSION

Public companies involved in green building and LEED certification should be cognizant of the risks involved in making unsupported or misleading claims regarding the performance of green buildings or the relevance of LEED certification. Disclosures should avoid making unqualified or unsupported generalizations regarding the performance of buildings or of the perceived benefits of certification under LEED. Any such disclosures should be reviewed by professionals with knowledge of the mechanics of the certification process, applicable law and the defensibility of certain claims related to green building performance, based upon available data. More generally, in order to deliver true value to shareholders, a company's building portfolio managers should negotiate its building contracts and LEED point selections with a focus on delivering meaningful energy performance and any other green features specific to the company's sustainability goals and marketing objectives. ■

ENDNOTES

1. See, e.g., National Public Radio story at *http://www.npr.org/templates/story/story.php?storyId=5528063 or http://www.greenerbuildings.com/feature/2008/03/26/sustainable-solutions-the-impact-green-building-movement*, or *http://archrecord.construction.com/news/daily/archives/060807green.asp*, each describing green building's popularity in the language of a social "movement."

2. See USGBC website "About LEED" presentation at: *http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1720*.

3. Id.

4. See USGBC memorandum available at: *http://www.usgbc.org/ShowFile.aspx?DocumentID=3340*.

5. "Q&A on Green Buildings With Rick Fedrizzi," Rebecca J. Bell, Boston Globe, 9/20/2008.

6. See, e.g., tax incentives listed on US EPA website: *http://www.epa.gov/greenbuilding/tools/funding.htm.*

7. See, e.g., announcement of California green building code: *http://www.scsa.ca.gov/news/pdf/Press_Release_071708.pdf.*

8. See, e.g., the Seattle program described here: *http://www.seattle.gov/dpd/GreenBuilding/OurProgram/PublicPolicyInitiatives/DevelopmentIncentives/default.asp*. or the Boston program described here: *http://www.cityofboston.gov/bra/gbtf/documents/Boston%20Zoning%20Code%20Green%20Bldg%20Amendments.pdf.*

9. See, e.g., Consent Decree in U.S. v. Amer. Elect. Power Serv., available at *http://www.epa.gov/Region4/foiapgs/readingroom/amerelecpower/aep_cd.pdf.*

10. See, e.g., "Leadership in Energy and Environmental Design is Emerging as the Preferred Method for Certifying Sustainable Buildings in China," available at *http://www.joneslanglasalle.com.cn/en-gb/news/2007/leedchina.htm*.

11. See *http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222*.

12. See USGBC memorandum available at *http://www.usgbc.org/ShowFile.aspx?DocumentID=3340.*

13. See, e.g., Sandra Zaragoza, "Wal-Mart to Open First 'Green' Store in McKinney," *Dallas Business Journal*, available at: *http://www.bizjournals.com/dallas/stories/2005/05/30/newscolumn6.html* and a description of the Target green building initiative at: *http://sites.target.com/site/en/corporate/page.jsp?contentId=PRD03-002348*.

14. *http://www.usgbc.org/News/USGBCInTheNewsDetails.aspx?ID=3786.*

15. Id.

16. Id.

17. *Securities Regulation*, Marc I. Steinberg, 1998, at 1.

18. *http://securities.stanford.edu/scac_press/20070728_YIR08mid_Press_Release.pdf.*

19. "Securities Fraud." Twenty-Third Annual Survey of White Collar Crime, Zathrina Perez, Eric Cochran, Christopher Sousa, *American Criminal Law Review*, 22-MAR-08, available at *http://www.accessmylibrary.com/coms2/summary_0286-34495177_ITM.*

20. See, e.g., the Private Securities Litigation Reform Act of 1995, (PSLRA), 15 U.S.C. § 78u-4(b). Among other things, it contains provisions that increase the burden of proof placed upon potential class-action securities plaintiffs at the outset of litigation, making it easier for a court to dismiss the entire litigation at an early stage.

21. Id.

22. Section 15, Liability of Controlling Persons, Securities Act of 1933 and Section 20, Liabilities of Controlling Persons and Persons Who Aid and Abet Violations, Securities Exchange Act of 1934.

23. "Recent Trends in Shareholder Class Actions: Filings Return to 2005 Levels as Subprime Cases Take Off; Average Settlements Hit New High," Stephanie Plancich, Ph.D., Brian Saxton, and Svetlana Starykh, available at *http://www.nera.com/image/PUB_Recent_Trends_Dec2007_FINAL.pdf.*

24. See, e.g., "A Better Way to Rate Green Building," Henry Gifford, available at: *http://869789182725854870-a-energysavingscience-com-s-sites.googlegroups.com/a/energysavingscience.com/www/articles/henrysarticles/BuildingRatingSystems.pdf?attredirects=0* and "Uncertified Green Building Claims," Charles Kibert, available at *http://kibert.blogspot.com/2007/04/uncertified-green-building-claims.html.*

25. It should be stated that the USGBC is fully aware of such shortcomings and is working steadfastly to amend its products to better address these issues. See, e.g., USGBC's description of LEED 2009 available at *http://www.usgbc.org/DisplayPage.aspx?CMSPageID= 1849.* Despite its shortcomings, LEED remains an important innovator and driver of meaningful change in the construction, building maintenance and building products industries, helping to create the much anticipated green economy.

26. 10-K of Kimball International, Inc. available at: *http://www.sec.gov/Archives/edgar/data/55772/000005577208000010/k08.htm.*

27. 10-A of Pure Earth, Inc., available at: *http://www.sec.gov/Archives/edgar/data/1436351/000136231008004306/c74106e10v12gza.htm.*

28. S-11 of CB RICHARD ELLIS REALTY TRUST , available at: *http://www.sec.gov/Archives/edgar/data/1297587/000119312508161521/ds11.htm.*

29. 10-K of Open Energy Corporation, available at: *http://www.sec.gov/Archives/edgar/data/1176193/000110465908058717/a08-22717_210k.htm.*

FOCUS ON GREEN BUILDING

Legal Issues Arising Out of Green Building Legislation

BY STEPHEN T. DEL PERCIO, ESQ.

As concern about the state of the natural environment continues to rate higher on the public's agenda, an increasing number of state and local governments have enacted legislation to combat the significant environmental impact of building construction and operations. As of August 2007, 24 states and 90 local governments had adopted the U.S. Green Building Council's (USGBC) LEED® green building standards, while 12 states had included the Green Building Initiative's Green Globes system in legislation. Moreover, recent information from AIA suggests that 14 percent of U.S. cities larger than 50,000 people have green building programs. Each program differs in terms of scope and implementation; some apply through a local building code, while others have been implemented through various types of zoning ordinances. Some municipalities mandate compliance with third-party certification regimes, while others provide various types of incentives as a means of encouraging projects to implement sustainable design features or seek third-party ratings. Nevertheless, in the rush to respond to what many believe to be an imminent natural crisis, much of this legislation has been quickly passed without consideration of its broader legal ramifications.

As a threshold issue, some pieces of legislation have been drafted poorly, incorrectly defining significant terms. For example, Washington, D.C.'s Green Building Act of 2006 (discussed in greater detail elsewhere in this issue by Bryan Seifert) seems to misunderstand the fundamental concept of a performance bond, and led the National Association of Surety Bond Producers (NASBP) to advise its constituency to refuse to issue such bonds until the Act's language was clarified. The purported "performance bonds" essentially serve as a penal sum under the Act in the event that a project fails to meet the requisite level of LEED certification. As drafted, the legislation presents other problematic provisions, including obvious conflicts of interest where the agency evaluating compliance is funded by forfeited fees from projects that fail to meet LEED requirements. Despite NASBP's protests, all indications are that the District is forging ahead with the legislation as drafted, which could have serious repercussions across the surety landscape.

While green building mandates originated in the public sector, an increasing number of laws are migrating to private sector construction, obligating projects over a certain size to comply with an independent, third-party rating system over which the local government exercises no control. For example, Babylon, New York, on Long Island, enacted an amendment to the local building code stating that it "hereby adopts, in principle, the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design for New Construction Rating System, Version 2.2. and, further, automatically adopts **any future versions** promulgated by the USGBC." Enacted

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in 2006 as the town's Local Law Number 40, the legislation presents numerous problems for a number of reasons that are detailed later on in this article. Fundamentally, though, this type of legislation is simply undemocratic. It takes local government completely out of the decision-making process and hands control of the building code to a third-party organization over which the public exercises zero oversight.

The legislation took effect in late 2007, and requires all projects greater than 4,000 square feet to receive LEED certification prior to receiving a certificate of occupancy. Has Babylon now tied itself to whatever that next-generation LEED system will ultimately look like? If so, it seems prudent for similar pieces of legislation to include sunset provisions or other grounds for periodic local government review to ensure that they are resulting in the desired outcome.

Legislation containing vague provisions of this type and insufficiently vetted by stakeholders may have serious practical consequences for insurance as well. While other sectors of the insurance coverage market are currently monitoring what's happening across the green real estate industry, the first coverage sector to offer a specific green building endorsement was the property insurance market. Fireman's Fund, Lexington, ACE, Liberty Mutual and Travelers all now offer various types of endorsements to their property insurance policies. For example, in the event of a partial or total loss (e.g., a fire destroys part or all of a building), property insurance policies will typically pay for the cost of rebuilding a building to its pre-loss condition. However, in the absence of a specific endorsement to such a policy, a building owner's property insurer may deny the owner's claim for the costs of certifying the building in order to comply with newly enacted green building legislation. In the current regulatory environment, it's critical that owners continue to monitor local legislative activity and review the terms and conditions of their property insurance with vigilance.

From a broader policy perspective, suppose an owner purchases one of these available green building endorsements, either to upgrade from LEED Silver to Gold or to simply get a rebuilt building certified after a covered loss. What if the rating system itself changes? We have certainly seen plenty of mid-year amendments to LEED, changing credit requirements and prerequisites, for example. What about the next-generation LEED system (LEED 2009) under development right now? Will a Silver rating under that iteration of the rating system be equivalent to a Silver rating under the current version of LEED? This is unlikely, and even more, what will the applicable LEED product look like in five years with the USGBC's avowed desire to continually increase the rating products requirements?

Much of the legislation enacted to date has left these types of key considerations unanswered. For example, will the legislation follow the rating system, or will it periodically be amended to reflect third-party updates? If legislation itself is a moving target, it's even more critical for owners to scrutinize their insurance policies to ensure that sufficient coverage will be available in the event that their projects must comply with a freshly enacted third-party mandate.

While the scope of green construction claims of negligence is beyond the range of this particular article, one practical application of green building legislation may be causes of action asserted as negligence per se. Generally speaking, negligence per se is a legal doctrine that allows a plaintiff to recover in negligence where it can demonstrate that a defendant violated a statute designed to address public safety. It is an easier claim to assert than negligence standing alone because expert testimony is not needed to demonstrate a breach of duty. For example, suppose a contractor is required by an owner to apply for third-party certification as mandated by local legislation. Suppose the contractor fails to do so, or the project itself merely fails to reach the required level of certification. The owner would not need to establish the four prongs of a negligence claim in order to establish that the contractor was negligent; rather, the simple failure of the project to reach certification would be prima facie evidence that the contractor had, indeed, been negligent. The negligence per se claim, of course, would sound in addition to any other causes of action, including breach of contract that the owner might be able to assert against the contractor. Municipalities that enact legislative mandates requiring specific certification levels for projects to achieve under third-party ratings may therefore unwittingly be greasing the wheels of litigation for aggrieved green building plaintiffs.

Third-party-driven green building legislation has the real potential to spawn litigation if project participants are not aware of the specific provisions of applicable state or local level regulatory schemes. The best paradigm for analyzing such a scenario comes from a recent project in northern California—called the Gaia Napa Valley Hotel—

where a local municipal incentive offered the developer of the hotel a $1 million tax rebate for occupancy tax revenues, conditioned on the project receiving LEED certification. The hotel opened in November 2006, but didn't formally receive LEED Gold until July 2007. The municipality did not budge, and required the developer to wait for the rebate until it actually received its rating.

While there hasn't been any reported litigation arising out of this particular project, imagine for a moment that, as is typical in many of the third-party-driven schemes that have been created, the local building code had conditioned a certificate of occupancy on receipt of formal certification, or was holding a fixed dollar application sum (generally a percentage of project square footage) in escrow until the USGBC officially made the award. These types of scenarios create the conditions for a developer to seek some sort of recourse, and demonstrate why conditioning official compliance with legislation, and essentially emphasizing process rather than product, is dangerous from the perspective of potential litigation. Moreover, municipalities that fall within the Gaia Napa Valley Hotel paradigm may face claims that they have violated the non-delegation doctrine by improperly delegating a governmental function (reviewing compliance with a local green building program) to a private entity (e.g., USGBC). Accordingly, it's critical that local programs include an appeals process through which projects are given the ability to contest third-party certifications or petition local government in the event that formal certification is delayed due to circumstances beyond either the municipality's or applicant's control.

Given the rapidly changing regulatory environment, it was not surprising that the first green building lawsuit in the country arose out of a project where the developer expected to receive more than a half-million dollars in tax credits under a state-level green building program keyed to LEED Silver. The case, *Shaw Development versus Southern Builders*, arose out of the construction of a 23-unit condominium project on the eastern shore of Maryland, and has apparently settled out of court. In order to take advantage of the credit, the project had to receive a certificate of occupancy by a certain fixed date as set forth in the contract. The project was delayed by more than nine months and the owner was unable to take advantage of the tax credit. The contract itself (which was the AIA's 1997 version of the A101 Owner/Contractor Agreement) contained no reference to the legislation and accordingly, there was no risk transfer mechanism drafted between the owner and contractor. Again, it's hard to draw any conclusion other than the parties (or their attorneys) did not understand the provisions of the legislation that the owner sought to leverage, and litigation was the unfortunate result of that failure. The lawsuit also demonstrates the danger of relying on form contracts in connection with green building projects, particularly where legislation may apply to either a mandate or an incentive.

The twist in the factual posture of the case was that the allegations were not that the contractor (or a design professional or consultant) failed to secure formal certification from USGBC, as much of the literature written to date in the liability context suggests will be the feeding ground for potential litigation. Rather, it was the failure by both the owner and the contractor to recognize the risk implicated by the regulatory scheme that led to the claimed loss of tax credits. The contract documents included as exhibits to the court papers were devoid of any risk transfer mechanisms whatsoever with respect to securing the tax credits. A tight contract that recognized the risk of failing to complete the project on schedule would have: 1) assisted the contractor in determining whether it was capable of bearing a significant portion of that risk; and 2) provided the owner some level of assurance that in the event the contractor could not deliver the project as required in order to secure the tax credits, it would still have the ability to assert a breach of contract claim for that specific failure.

The lawsuit also raised some important insurance implications. Could the contractor's commercial general liability (CGL) policy have provided coverage for the owner's claim for the lost tax credits? CGL policies typically cover only property damage, so it seems highly unlikely. From the owner's perspective, if there was a waiver of consequential damages provision in the contract documents (which was unclear from the court papers), the owner would have a difficult time arguing that the claimed damages for lost tax credits should not be considered consequential. Nevertheless, it's clear that various legislative and regulatory regimes will have significant implications for insurance issues, and the cases emphasizes the point that both owners and contractors must monitor and proactively participate in the activity in this area to ensure that sufficient attention is paid to all stakeholder interests.

Putting aside the practical impact of legislating third-party rating systems and pursuant to Supreme Court case

law, constitutional questions may exist over the ability of a local government to regulate private land use through the application of rating systems that may not, in fact, bear a substantial relationship to the public health, safety, morals or general welfare. Pursuant to a well-known and well-settled case called *Euclid v. Ambler Realty* that essentially established the ability of the government to regulate land use, a local ordinance's provisions must be "clearly arbitrary and unreasonable" in order to be deemed unconstitutional. Alleging that LEED or any other green building rating system is "clearly arbitrary and unreasonable" would be difficult, though it may not be as difficult to show that portions of the rating system lack any objective basis for inclusion and enforcement by a government entity. Municipalities should demand that any third-party rating systems upon which their legislation will rest be supported by objective, performance-driven data in order to protect themselves from the potential—however slim it may be—for constitutional attack.

Legislating one specific building rating system into law may also present antitrust law implications under both statutory and case law authority. The Sherman Antitrust Act is the federal statute that permits a cause of action in federal court for anticompetitive business practices. In order to successfully allege a Sherman violation, a plaintiff must prove both anticompetitive conduct and—significantly in the context of sustainable building legislation—injury resulting from that conduct. When bringing suit against a standard-setting organization, a plaintiff must show either that its products were barred from inclusion in the standard on a discriminatory basis from its competitors, or that the conduct of the organization as a whole was manifestly uncompetitive and unreasonable.

The pivotal Supreme Court case dealing with standard-setting bodies, called *Allied Tube & Conduit Corp. v. Indian Head, Inc.,* is extremely interesting to analogize in the current green building landscape. In its ruling, after first noting that "private standard-setting associations have traditionally been objects of antitrust scrutiny," the Supreme Court upheld an antitrust claim against a member of the National Fire Protection Association. The plaintiff, a manufacturer of plastic electrical conduit, claimed that a rival association member, who manufactured steel conduit had packed the Association's annual meeting with other members who had agreed to exclude plastic conduit from the Association's National Electric Code.

The Court called the Code "the most influential electrical code in the nation," and noted that many governments adopted it into law by reference. It noted that "members of such associations often have economic incentives to restrain competition and that the product standards set by such associations have a serious potential for anticompetitive harm."

Moreover, it found anticompetitive effect in the case from what the Court called the "predictable adoption" of the Code into law by a large number of state and local governments. Ultimately, the Court held that the member entity could not "bias the process" by stacking the association with decision-makers sharing the entity's economic interest in restraining competition. However, it did note the potentially pro-competitive effects that might result from standards based on objective expert judgments, obtained through procedures that prevented the process from being biased by members with an interest in stifling competition.

A subsequent case to *Allied Tube,* called *Radiant Burners, Inc. v. Peoples Gas Light & Coke Co.,* demonstrated the potential for anti-competitive effect. There, an antitrust claim was brought by the manufacturer of a ceramic gas burner against the American Gas Association and ten of its member constituents, which included gas distributors. The plaintiff alleged that the Association's "seal of approval" was established not through "objective expert judgments," but with tests that were influenced by its own stakeholders who were competing producers of gas burners. According to the plaintiff, it had submitted its ceramic burner to the Association for approval twice, and although its product was safer and more efficient than the rival burners, it was rejected both times. Moreover, because the Association's gas distributors refused to provide gas for use in the plaintiff's burner, it had been effectively excluded from the marketplace.

The parallels that this line of case law offers to the current green building landscape are striking. USGBC, for example, includes a large number of industry stakeholders who actively participate in the organization's creation of the LEED-rating product attributes. It is not difficult to imagine a scenario where a product manufacturer, who may be excluded from a particular sustainable building rating system, brings an antitrust claim and alleges, as the plaintiff did in *Radiant Burners*, that the standard-setting process is not based on objective standards, but is instead influenced by its own stake-

holders, some of whom are in direct competition with our hypothetical product manufacturer. It is clear from many of the attributes of the LEED rating system product that whole industries or material categories are to be shunned in an effort to acquire the certifications. Enshrining these biases into legislation seems an unproductive effort and has been recognized as such by at least some state green legislation that has specifically eliminated LEED system attributes when it appeared to be directed at local industries of import.

Thus, the argument could be advanced that the standard-setting determinations themselves are indeed being made arbitrarily and capriciously. If done so successfully, this line of argument could also help buttress a constitutional law claim that the rating system in question has "no substantial relation to the public health, safety, morals or general welfare."

These antitrust considerations, though somewhat theoretical, are real and grounded in well-settled federal case law. Although practically, an antitrust action is extraordinarily expensive to maintain, given the scope of what a plaintiff must prove, it's difficult to ignore the parallels that existing case law presents. What's most significant in the context of this article though, is that the *Allied Tube* Court specifically pointed to legislation as the basis of proof for market effect. As increasing numbers of state and local governments adopt, for example, the LEED rating product, barriers to market entry may be created, thus making this prong of an antitrust claim easier for a potential plaintiff to prove.

Indeed, USGBC itself seems to have, at least implicitly, recognized the potential for an antitrust claim. Its recent efforts to expand the certification options for wood products that will qualify for LEED credits suggests that it is taking the antitrust issue seriously, though the legal profession should continue monitoring the landscape. Indeed, antitrust may also be driving the "LEED Certifiable" concept in many legislative enactments. "LEED Certifiable," or regulations that allow flexibility in implementation in terms of the rating system, are one way of addressing the potential for antitrust litigation, though they are more often seen as a way to obviate the need for spending public monies that would go to the fees and administrative processes attendant on obtaining a LEED certification. In particular, where the pursuit of certification will increase the expenditure of public monies, the fiduciary duty of public officials may be in question. For example, the changes to the recent re-enactment of green building legislation in King County, Washington, were motivated by an analysis of the actual additional costs borne by the county in erecting public buildings required by the previous legislation to seek LEED certifications.

Finally, *Air Conditioning, Heating and Refrigeration Institute et al. versus City of Albuquerque*, a case that was just filed in July 2008 in New Mexico, may also have profound implications for state and local-level green building regulatory activity. The city of Albuquerque's proposed Energy Conservation Codes purported to raise the standards on the installation of HVAC equipment for all new and retrofit commercial and residential projects to a Seasonal Energy Efficiency Ratio (SEER) of 15 (for air conditioning) and an annual fuel utilization efficiency (AFUE) of 90 percent (for heating).

The suit, filed in U.S. District Court for the District of New Mexico by the Air Conditioning, Heating and Refrigeration Institute, the Air Conditioning Contractors of America, the Heating, Air Conditioning, and Refrigeration Distributors International, and 11 HVAC product distributors and contractors, alleges that because current U.S. Department of Energy minimum standards for energy efficiency for the same equipment that the Albuquerque Codes seek to regulate are lower (13 SEER and 78 AFUE), the city must obtain a waiver of preemption from the federal government in order to enforce the stricter local codes. The plaintiffs and other industry groups had worked with local officials to try and reach a compromise, but once a self-imposed deadline passed, the groups filed suit.

The essence of the plaintiffs' preemption argument was that because the federal government has already acted to regulate the same type of equipment, an implied preemption exists whereby the federal regulation is meant to occupy the regulatory scheme with respect to energy efficiency for HVAC equipment. The plaintiffs claimed in their complaint in the action that the Codes would increase the cost of construction due to higher installation costs and lead to illegal installation of cheaper equipment from unlicensed contractors.

Moreover, the current patchwork of green building regulations at the state and local level, mandating different types of requirements under different rating systems, is similar to the type of scenario that the plaintiffs in *Air Conditioning, Heating and Refrigeration*

Institute are fighting against. The new administration in January 2009 is likely to increase activity at the federal level related to energy consumption of buildings and larger-scale interventions based on either a carbon tax or a cap-and-trade system for greenhouse gas equivalents, which could have serious repercussions for state- and local-level legislation that is unable to obtain a waiver of preemption from the federal government.

Enacting legislation without considering these critical legal implications is irresponsible and dangerous to the long-term prospects for the sustainable building movement at large. Every real estate industry stakeholder will agree that environmental conservation is an important goal. However, by quickly passing legislation that does not consider serious legal ramifications, state and local governments may ultimately end up pushing the building industry, owners and developers away from that critical—and desirable—outcome. A morass of litigation challenging regulatory schemes that are poorly drafted or essentially illegal would ostensibly shoot the sustainable building movement in the foot. Questioning the validity of these schemes should not be construed as legal pessimism, but rather an important piece of the dialogue that will, hopefully, result in a more sustainable outcome. ■

FOCUS ON GREEN BUILDING

Energy Performance in Residential Green Developments: A Florida Case Study

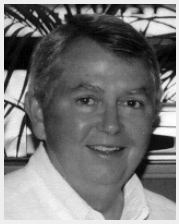
BY PIERCE JONES, PH.D., AND UJJVAL K. VYAS, PH.D., J.D.

THE COMMERCIAL AND RESIDENTIAL SECTORS both have an important role to play in any worthwhile attempt to decrease the overall energy consumption of the United States. Often, the residential sector is too fragmented to provide real, economically sound returns on investment in increased efficiency or overall decreased consumption of energy without direct or indirect subsidization. A good example is the common use of demand side management programs, administered and funded by local and regional utilities, in conjunction with various state-funded subsidies. Until recently, the use of either direct or indirect subsidies was the chief mechanism to push for change in the residential market. This paper addresses the situation in a Florida context, but the issues have national application.

RESIDENTIAL GREEN BUILDING CERTIFICATION PROGRAMS

"Green certification" programs at both the national and local levels are trying to provide an avenue for increasing brand power for premium pricing while attempting to encourage appropriate energy and resource reduction options. In our studies we have concentrated on the ENERGY STAR® certification developed and administered by the U. S. Department of Energy and the U. S. Environmental Protection Agency because of its longer track record and robust building performance concentration. ENERGY STAR has the largest number of residential units certified, with an estimated 12 percent of new homes achieving the certification.[1] This is important because it allows a large enough number of data points to obtain meaningful statistical outcomes. We also selected ENERGY STAR because of its robust third-party verification through the use of Home Energy Raters (HERS) trained and certified by Residential Energy Services Network, a respected industry standard-setting body for residential energy efficiency. The ENERGY STAR system has been in operation since 1992, and a version applying to homes was started in 1995. Other rating product certifications include the National Association of Home Builders Model Green Home Building Guidelines, the U. S. Green Building Council's (USGBC) Leadership in Energy and

About the Authors



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Environmental Design (LEED®) Green Building Rating System™ for Homes, and the local Florida Green Building Coalition's own building standards for residential construction, as well as numerous green building programs nationwide.

ENERGY STAR is often referred to as a performance-based program, but in fact it is more accurately a prescriptive path program using the HERS index to model predicted performance. The term "performance-based" could be misleading in that actual energy consumption of homes is not measured post-occupancy or required for ENERGY STAR certification.

The homes that earn the ENERGY STAR designation must meet guidelines for energy efficiency set by the Environmental Protection Agency and the Department of Energy. ENERGY STAR-qualified homes are designed to be at least 15 percent more energy efficient than conventional homes. The ENERGY STAR Qualified New Homes program applies to total energy consumption for heating, cooling, domestic water heating, lighting, appliances and on-site energy production. ENERGY STAR-qualified new homes can include a variety of energy-efficient features such as upgraded insulation, high-performance windows, tight construction and ducts, efficient heating and cooling equipment, and ENERGY STAR lighting and appliances. These features contribute to improved home quality and homeowner comfort, and can lower energy demand and reduce air pollution.

LEED for Homes is a green building rating system product released by the USGBC that covers some performance, environmental and social welfare issues. Based on a highly successfully marketed green building rating system for new commercial construction, the hope is to achieve equal success in the residential market. LEED for Homes is aimed at a new home market interested in including sustainable design features.

While there are already a number of local or regional green homebuilding programs, LEED for Homes is attempting to provide national consistency in defining the features of a green home and to enable home buyers anywhere in the country to identify green homes. LEED for Homes was developed and refined by a diverse group of national experts and experienced green builders. The LEED for Homes Green Building Rating System measures the overall performance of a home in eight categories that include location, site, water efficiency, energy, materials, indoor air quality and education.

The National Association of Home Builders (NAHB) has developed voluntary *Model Green Home Building Guidelines* designed to be a tool kit for the individual builder looking to engage in green building practices as well as for home builder associations (HBAs) looking to launch their own local green building programs. This certification addresses the builder and the building process rather than the individual home. The system aims to organize the green design and construction process and help home builders incorporate more green building features into their homes. The *NAHB Green Building Guidelines* address seven primary sections including lot design and development, materials, energy, water, indoor air quality, homeowner education and global impact.

While the LEED for Homes rating system is geared to appeal to the final consumer, the NAHB is interested in embedding the green preferences into the product delivery chain. Given the current residential market, it remains to be seen if consumer price sensitivity will allow any significant uptake for the LEED or NAHB products.

It should be noted that none of these green residential certification programs are structured to measure or verify post-occupancy performance of the home. Thus they remain incapable of contributing to increasing our data pools for analyzing and improving on the real performance attributes of green residential buildings. Surprisingly though, many developers, lawmakers and government officials have become convinced, as a result of active marketing campaigns, that a green rating will serve as a credible proxy for post-occupancy performance. Given the nature of the green certifications at present, only the ENERGY STAR qualification procedure, primarily because it is based on an actual testing and verification of certain crucial attributes of energy performance, provides some initial assurance of subsequent energy performance. It should be noted that ENERGY STAR figures prominently in the energy efficiency sections of the LEED and NAHB rating system as well.

FLORIDA LEGISLATION

On July 13, 2007, Florida Governor Charlie Crist concluded the first Florida Summit on Global Climate Change by signing three executive orders. Many of the ideas in the executive orders are directly and significantly changing Florida's building construction practices. Among other things the governor ordered Florida's Department of Management Services to "adopt the USGBC's Leadership in Energy and Environmental Design for New Construction (LEED-NC) standard for all new buildings," and he precluded all state agencies

from leasing "office space that does not meet ENERGY STAR building standards."[2] He also established "greenhouse gas emissions reduction targets;" directed the Florida Department of Environmental Protection (DEP) to achieve "adoption of a maximum allowable emissions level of greenhouse gases for Florida's electric utilities;" and directed the Department of Community Affairs to revise the "Florida Energy Code for Building Construction to increase the energy performance of new construction in Florida by at least 15 percent from the 2007 Energy Code."[3] Finally, he established the Florida Governor's Action Team on Energy and Climate Change with a mandate to recommend legislative policies in specific areas—for example, "market-based regulatory mechanisms, such as cap and trade, for use in efficiently reducing greenhouse gas emissions."[4]

One year later, at the second Florida Summit on Global Climate Change, Governor Crist signed Florida House Bill 7135 into law, enacting new energy and climate change policies. Sections 17 through 22 of the energy bill codify the green construction standards outlined in the governor's executive orders, specifically requiring all design, construction and renovation of state-owned buildings to be certified through the USGBC's LEED rating system, the Green Building Initiative (GBI) Green Globes rating system, the Florida Green Building Coalition's (FGBC) standards, or another nationally recognized rating system. The legislation also authorized the Florida Climate Protection Act, mandating the DEP to develop a greenhouse gas (GHG) cap-and-trade program that could begin operation as soon as Jan. 1, 2010.

Although the events described above are unique in the Southeast, many other states nationwide are moving to adopt energy efficiency standards and reduce greenhouse gas emissions (most notably California). As Stephen Del Percio reports in another of the articles in this issue, "24 states and 90 local governments had adopted the U.S. Green Building Council's LEED green building standards, while 12 states had included the Green Building Initiative's Green Globes system in legislation" as of August 2007. These green certification programs are being adopted as standards of performance, in spite of the fact that there is very little information about how buildings designed and constructed in compliance with these programs actually perform.

PROJECT BACKGROUND

The building science aspect of energy-efficient construction is well understood while the most variable component of residential energy efficiency lies in occupant behavior and building maintenance. While the HERS rating system takes into account many of the factors that affect home energy use, it serves only as an indicator of actual energy use. This is a crucial and often overlooked point in many of the current discussions about green rating system products and/or certifications: they are not structured to actually measure the real energy consumption rates of the homes or developments that are given the certification. It is our hope that the current research work at the University of Florida, which significantly updates and expands detailed earlier work in the Gainesville area, will provide the necessary data and protocols for analysis in a fully transparent manner to aid the real development of the energy-efficient residential market. This paper provides only some of the initial indications of the data analysis, but they are of import for policymakers and developers. Fully detailed papers are being prepared for publication and should be available shortly.

Consumers (and developers) lack basic information with which to properly monetize residential energy efficiency attributes. Aside from anecdotal information, homeowners have very little idea of how their household energy consumption compares to community average consumption patterns. Further, they often have only a general idea of how energy efficiency upgrades and behavioral changes could affect their utility bills. Acquisition of the proper utility information, provided in a manner that would enable open comparison, would be a first step toward creating an adequate information pool for residential product differentiation in the market and for developers to clearly understand the proper pricing the market will bear. If a consumer cannot easily acquire the information that "X" house uses a significantly lesser amount of energy than "Y" house (putting aside behavioral considerations for the moment), a buyer cannot properly account for these attributes in willingness to pay any premium pricing.

2003 PUBLISHED STUDY

The University of Florida began a research project to analyze the actual metered performance of ENERGY STAR homes in Gainesville, with the goal of determining if, and to what degree, energy-efficient residential developments provided real economic benefits for the

homeowners. Three major issues were examined: 1) whether ENERGY STAR developments really perform better in terms of energy consumption relative to other comparable homes; 2) if so, whether this was of any statistical significance in providing reduced homeownership costs; and 3) what policy implications could be gleaned from the results.[5] Single-family detached homes in four conventional developments were compared with those in an ENERGY STAR development. Two local utilities that supplied the gas and electricity for the ENERGY STAR and control homes provided data so that we could independently ascertain the real energy consumption data pool. The data were scrubbed and appropriately normalized prior to statistical analysis (in this case an analysis of variance methodology) to prevent skewing.[6]

The results of the 2003 study show that there was a statistically significant energy savings and the units sold in the chosen ENERGY STAR development fared well against non-ENERGY STAR units for the years 2000 and 2001. In fact, "energy savings resulted in annual utility cost savings for the average ENERGY STAR household of $180 per year, which was capitalized to indicate a value increase of the average housing unit of $4,500 and the ability to afford a mortgage of $2,255 more than in the absence of the energy savings."[7]

In an effort to expand on this work, a research agenda was established to acquire the data for the same set of developments but to compare the data set from 2000 with the data set of metered information provided by Gainesville Regional Utility and Clay Electric Cooperative

Figure 1a

Gainesville Developments

Development	n-value	Avg. home size	Built dates
Broadmoor	114	2018 sq ft	1996-1999
Capri	106	1863 sq ft	1996-1999
Eagle Point	114	1788 sq ft	1996-1999
Mentone	92	1708 sq ft	1996-1999
Stillwind	46	1828 sq ft	1997-1999

All homes in the 2003 and 2007 studies for residential developments in Gainesville, Florida, have full electric and natural gas use data for 2000 and 2006, and were market rate with comparable pricing.

Source: Pierce Jones 2008

Figure 1b

Methodology for Comparing Neighborhoods

Five subdivisions were evaluated to compare energy consumption in ENERGY STAR® versus conventionally constructed homes in the Gainesville, Florida, market. One subdivision, Mentone, began building ENERGY STAR qualified homes in 1998 and averaged approximately 50 houses per year. The four other subdivisions (Capri, Stillwind, Broadmoor and Eagle Point) were built to comply with the Florida/local building code. All homes are frame construction with fiber cement plank siding. They are all air-conditioned and use natural gas (NG) for domestic water and space heating (NG furnace). The houses are all single-story and are mainly 3-bedroom/2-bathroom split plans.

Population Selection and Data Cleaning:

- Homes were selected based on parcel number to identify neighborhoods
- Data were cleaned to include only 2000 and 2006 utility use data
- Homes without a full set of use data for both 2000 and 2006 were excluded from the study
- ENERGY STAR status was determined using the Florida Solar Energy Center's database of HERS-rated ENERGY STAR homes

Data Compilation and Analysis:

- Electric and natural gas data were compiled by month for each home (e.g., if a home had two readings in one month, the data were proportionately combined to represent the full month)
- Monthly data were corrected –data were broken into average daily use by dividing monthly use by metered days –daily use values were multiplied by 30.5 to correctly represent an average month
- Total energy was calculated using the following equation:
  - o Total = Electric + (NG x 29.3kWh/therm)
- Individual household data were compiled by subdivision to represent neighborhood averages

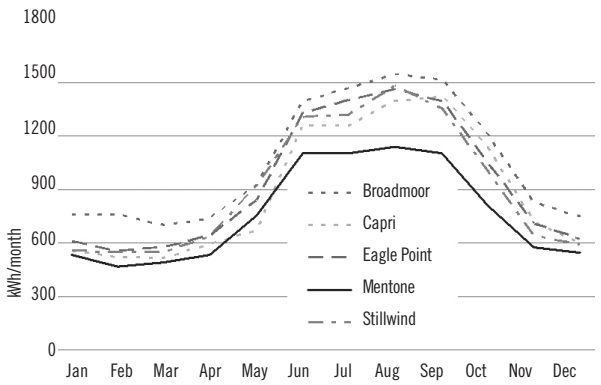
Methodology for comparing ENERGY STAR development to non-ENERGY STAR developments used for both 2000 and 2006 data.

Source: Pierce Jones 2008

for 2006. By updating the data (in 2007), we expected to see the energy savings gain momentum at the ENERGY STAR development previously studied. A more detailed description of the methodology used can be found in Figures 1a and 1b below.

Figure 2a

2000 Electric Energy Consumption

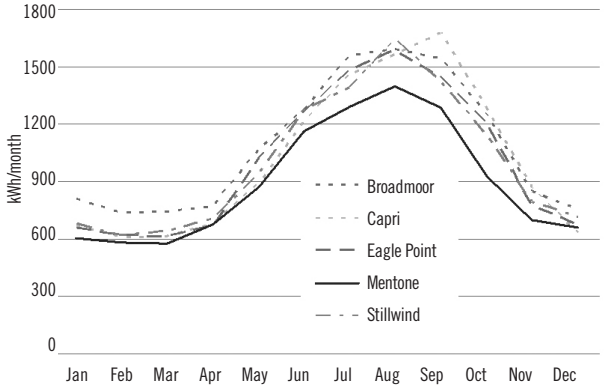


Monthly average household electric energy use for Mentone, an ENERGY STAR® development, and four non-ENERGY STAR developments for calendar year 2000.

Data provided by Clay Electric Cooperative

Figure 2b

2006 Electric Energy Consumption

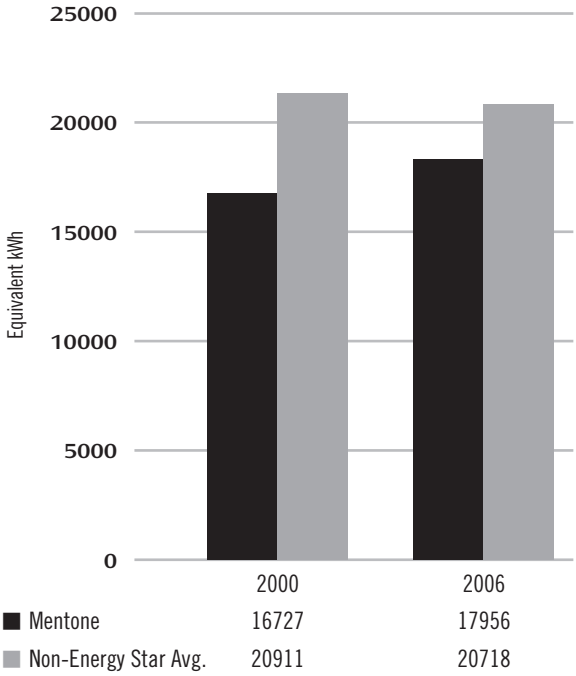


Monthly average household electric energy use for Mentone, an ENERGY STAR® development, and four non-ENERGY STAR developments for calendar year 2000.

Data provided by Clay Electric Cooperative.

Figure 3

Change in ENERGY STAR®



Total average household energy use (gas and electric) for Mentone, an ENERGY STAR development, and four non-ENERGY STAR developments for calendar years 2000 and 2006. Natural gas consumption has been converted to equivalent kWh for comparison.

Electrical consumption data provided by Clay Electric Cooperative. Natural gas consumption data provided by Gainesville Regional Utilities.

Several preliminary indications can be drawn from the analysis so far. As we can see in Figures 2a, 2b and 3, some changes worth noting have taken place between 2000 and 2006.

DISCUSSION AND OUTCOMES

An examination of the graphs shows three things. First, the general performance of the different developments has remained similar relative to each other. This suggests that the change in energy use performance over time has remained generally consistent among the developments, indicating that the root bases for energy use have not changed appreciably. To put it another way, none of the developments has radically changed its performance profile relative to the others.

Because Florida is a cooling-dominated climate, natural gas usage is minor compared with the electricity required

for summer air conditioning needs. We include only the electrical consumption graphs (Figures 2a and 2b) for this reason. The gas data for 2000 and 2006 continue to show the same general relative contours between the various home developments as the electric consumption in both 2000 and 2006. It should be noted that the lower boundary for electrical energy use has increased for all the developments in 2006 (and shows similar kWh equivalent increases in the natural gas consumption). This indicates that all the developments, including the ENERGY STAR-qualified development, are at a higher minimum energy usage requirement. This is not unexpected given the continuing rise of energy use by both the residential and commercial sectors, even with the rapid increase and deployment of energy-efficient products. Whereas in 2000 the occupants might have had one or two telephones and one or two computers, chances are that in 2006, every member of the family had his/her own cell phone and computer. All of these devices are consuming more energy and also creating a larger load based on the use of many miscellaneous appliances.

Second, both the statistical comparison of ENERGY STAR and conventionally built homes constructed in Gainesville and the 2003 study found ENERGY STAR homes to be more energy efficient in both calendar years 2000 and 2006. However—and this has some important implications—average energy consumption in the ENERGY STAR homes appears to have increased measurably more from 2000 to 2006, while holding nearly constant in the conventionally built homes (Figure 3). The total energy use of the Mentone development has, in fact, risen relative to the averages of the non-ENERGY STAR developments, and at present, our study does not have a useful explanation for this decrease in efficiency. The average total energy use of the non-ENERGY STAR homes has actually decreased by 200 equivalent kWh, but the Mentone usage has risen by almost 1200 equivalent kWh.

Although these studies did not engage the human behavioral element in the energy conservation outcomes, it is certainly worth further careful analysis to determine what role, if any, is played by self-selection and energy-consiousness fatigue in understanding ultimate performance. In addition, there is some variance in the average home size included in the studies, but the authors believe that the differences were relatively minor, and have no data to suggest that per capita or per household occupancy was significantly different in the various developments. Even so, future studies should look at size and average number of persons per household to address normalization issues. Such studies may need to elaborate on these behavioral and household occupancy issues.

Putting aside for now any human behavioral factors, let's proceed with the question: does initial higher performance in ENERGY STAR homes hold up over time? If the performance degrades over time, then any attempts to understand the additional value provided by the energy savings must take this into account. At the very least, assumptions that the ENERGY STAR home will provide consistently improved energy performance over the full life cycle of the home need to be explored in more detail. This should not diminish the fact that the Mentone homes did perform better than non-ENERGY STAR homes.

One implication of this outcome may be that the advantages of an ENERGY STAR home are limited in terms of economic value to a lesser number of years than the commonly used twenty- or thirty-year life cycle assumption linked to mortgage expectations. Another implication of this may be that the decreased number of years will have a real impact on the resale value of ENERGY STAR homes. Buying an ENERGY STAR home one year after the initial sale could have a very different pricing premium than a purchase at resale 10 years later.

Third, we can tentatively suggest some policy outcomes. The 2000 study provided evidence that building construction and home fit-out using energy efficiency as an important consideration—through the use of the ENERGY STAR residential system—could generate a net benefit of economic significance. The increased economic value or decreased hard costs resulting from energy savings could play an important role in policy for the affordable housing market.

A preliminary examination of the 2006 study suggests that the benefit is real—the net energy usage for both 2000 and 2006 was significantly lower in the ENERGY STAR homes. Yet this optimism must be tempered until we have adequate data regarding the decay rate of energy savings performance exhibited by the Mentone homes.

It is very important to recognize that this is a small study,

and though it is one of the first to deal explicitly with housing development performance data, it is still only the beginning. This limited analysis covers only one ENERGY STAR builder and does not include more recently constructed ENERGY STAR homes. However, at least one other recent study[8] suggests that recently built ENERGY STAR homes in Gainesville are performing no better than conventionally built homes. All in all, a much more comprehensive analysis is needed to account for climate, regulatory context, and local production cost factors if any worthwhile policy recommendations are to be devised for Florida and national application.[9] The most important policy outcome of this study, and of much of the work done by the University of Florida's Program for Resource Efficient Communities, is the indication that there is a dearth of available, credible data on energy consumption building performance at the residential level. Without this information it is difficult to begin the process of weaving together the economic, regulatory, insurance, financing and urban planning variables in anything but a speculative manner. The 2006 study suggests that there are some grounds for optimism, but optimism alone cannot be the basis of practical policies to effectuate change. ■

ENDNOTES

1. See *www.energystar.gov/ia/news/downloads/annual_report_2006.pdf*, p. 24. Last accessed Sept. 1, 2008. See generally, *www.energystar.gov/ia/partners/downloads/energy_star_report_aug_2003.pdf*. Last accessed Sept. 1, 2008.

2. Executive Order 07-126, Leadership by Example: Immediate Actions to Reduce Greenhouse Gas Emissions from Florida State Government.

3. Executive Order 07-127, Immediate Actions to Reduce Greenhouse Gas Emissions within Florida.

4. Executive Order 07-128, Florida Governor's Action Team on Energy and Climate Change.

5. "The Impact of Energy Efficient House Construction on Homeownership Costs: A Comparative Study in Gainesville, Florida," Marc T. Smith and Pierce Jones, *Family and Consumer Sciences Research Journal*, 2003; vol. 32, 76-98.

6. Ibid., 80-83. Please consult the article for a full and detailed explication of the methodology for data collection and data analysis. Transparent access to data sources and a properly substantive statistical analysis have been sorely lacking in the arena to determine whether green building rating systems can meaningfully provide economic benefits. But see an earlier robust example, Nevin, R. and Watson, G.,"Evidence of Rational Market Valuation for Home Energy Efficiency," *The Appraisal Journal*, 1998; vol. 66, 401-408.

7. Ibid., 96. For the assumption of a 4 percent cap rate for homes, see Nevin and Watson, 404 referenced in note 6 above.

8. Dustin Adam Bass, "Carbon Trading: A Catalyst for Energy Efficient Residential Construction", (unpublished M.Sc. in Building Construction thesis, University of Florida, 2007, on file with M.E. Rinker, Sr. School of Construction Management, University of Florida, Gainesville), 43.

9. The University of Florida Program for Efficient Resource Management and The Real Estate Center at DePaul University are currently teaming up to expand this research to other areas of the country, with the support of a research grant from the Green Building Initiative. Part of the 2006 study analysis was funded in part by the same Green Building Initiative research grant.

FOCUS ON GREEN BUILDING

Blinded by the (Green) Light: The Rise of Environmentalism and a New Vocabulary–Four Perspectives

BY RICHARD SHIELDS

Awareness of Energy and the Environment: Perspective One

A NEW ENERGY AND ENVIRONMENTAL AWARENESS was thrust upon the United States in the 1970s with the OPEC oil embargo.[1] Facing rising energy prices and gas shortages, the U.S. had a sudden realization that energy supplies would not keep pace with the world's consumption. As the economic fallout of the sudden rise of oil prices gripped the nation, the government responded with new regulations to reduce consumption. Programs included implementing gasoline rationing on alternating days based upon odd/even license plates, the establishment of an "Energy Czar," the creation of the Department of Energy, the imposition of a national speed limit of 55 miles per hour, and the creation of the Strategic Petroleum Reserve.[2] In the private sector, energy conservation quickly moved from being a technical field of interest that was centered in the manufacturing, energy production, transportation and building industries, to the concern of every citizen. A period of discovery, research, investment, new laws, incentives and even celebrations such as Earth Day[3] followed and set forth a new national imperative that has continued to evolve. The result has been an emergence of environmental industries and advocates that have had a significant impact both on the quality of our environment and on the reduction of energy consumption.

CREATING TRUST IN ENVIRONMENTAL PROGRAMS

Following the Oil Embargo, equipment, electronics and appliance manufacturers made great advances in the development of reliable and ever more environmentally responsible products. At first, there were many fads to save energy, and wild claims of environmental benefits of the recycled content of products. These fads created both confusion and mistrust of environmental claims. But soon, products designed to reduce energy and environmental impact through use of responsible materials and recycled goods became prevalent. As gains in energy conservation came to market, false claims in labeling of environmental benefits gave rise to a need

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for a responsible way to identify and prove that product claims were accurate. In 1992, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy established a voluntary labeling program known as ENERGY STAR®[4] to identify and promote energy-efficient products to reduce greenhouse gas emissions. Manufacturers signed on and began to produce appliances and other electrical devices whose newly engineered systems began delivering measurable environmental benefits, with direct cost and energy use information. Today, the ENERGY STAR label has become a trusted name in sustainable products for more than 12,000 organizations, delivering more than $16 billion in energy savings (over non-ENERGY STAR products) in 2007.[5]

FROM VOLUNTARY PROGRAM TO A LEGISLATED REQUIREMENT: LEED® GRADUATES AT THE HEAD OF THE CLASS

The nature of buildings, their ownership, use and location makes the subject of sustainable design complex. The industry struggled to find the connection between the professional and technical participants in the process of development, and to find a vocabulary to communicate expectations, desires and requirements. With thousands of government jurisdictions, countless zoning and build code requirements and diverse geographic locations in our nation, it is difficult to establish uniform standards or to navigate the diverse requirements for building design. The design community and industry organizations took the early leadership in establishing design and performance-based standards for building systems and components: insulation and sealants, glass and building skin, roofing, and HVAC and plumbing systems. These standards have provided engineered and measurable contributions to building design, achieved major improvements in conservation, and reduced the environmental impact of buildings. Communities have joined industry by adopting energy conservation standards and using these industry standards to define code and/or performance requirements.

A few short years ago, the U.S. Green Building Council (USGBC) trademarked its Leadership in Energy & Environmental Design, or LEED program. It is a voluntary but prescriptive system to promote and certify "green" buildings. Today, USGBC has more than 16,000 member companies and organizations, including real estate developers, architecture, design and engineering firms, contractors, product manufacturers, government agencies, educational institutions, nonprofit organizations, and 50,000 individuals who have received recognition in LEED processes.[6] This widespread adoption of the LEED rating system has brought an important focus to the building and design industry, and made sustainability a national priority.

USGBC's efforts have organized the uncertain and disparate jargon, practices, principles, and opinions with regard to energy conservation, consumption and environmental impact of buildings. USGBC has built upon many accepted engineered system standards and has expanded its evaluative process to include other attributes which project the opinions of professionals on the importance of design/project criteria. USGBC has seen its building certification program and its rating system become the nationally accepted benchmark for sustainable development, adopted by corporations, institutions and all levels of government, as required on development projects. What had been created as a voluntary certification process has morphed into regulatory requirements, as government organizations and communities have adopted the LEED certification for zoning or permitting. The rush to these standards has led to 20 states and more than 160 other jurisdictions implement LEED as a standard, while implementing and enforcing it in different ways.The acceptance by jurisdictions of the LEED standard as a prerequisite for zoning or permits creates a new responsibility on the part of governments to ensure that the certification of LEED buildings in their jurisdictions does, in fact, improve the environment, and that certification does not confuse or mislead the public as to what the requirement for LEED certification, or achieving it, represents.

Today more than 14,300 projects have submitted LEED applications, and more than 1,750 have been certified,[7] up from 40 in 2002. The ENERGY STAR classification system, with measurable results as to its contribution to the quality of the environment, continues to exist, although newer LEED certification of buildings strives to deliver savings far beyond those achieved by ENERGY STAR.

LEED certification is an important new standard for developing sustainable buildings and communities. However, development patterns that separate workspaces and living places can have a significant impact on the environment. The space between home and work demands the use of fossil fuels for the shipment of goods, commuting to work, shopping and recreation.

The concern over greenhouse gases from the emissions of fossil fuels has increased significantly, and petroleum use in transportation has become the largest contributor to the emissions of greenhouse gas from human activities. Transportation accounts for more than 31 percent of all CO^2 in the U.S., and CO^2 gas emissions account for 80 percent of all greenhouse gases produced in the U.S.[8]

Less than one percent of U.S. buildings have been certified by the USGBC.[9] With more than 80 million buildings in our nation, the goals set by USGBC present a major opportunity to make a positive impact on the environment. However, promoting environmental improvement by rewarding only buildings with certification shines the light too narrowly on too small a portion of the built environment. It certainly fails to adequately consider the impact of site selection. USGBC is addressing this concern with its new LEED-ND Certification, which gives greater importance to reduction of Vehicle Miles Traveled (VMT) to sites with transit services. ■

ENDNOTES

1. *http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/chronology/petroleumchronology2000.htm#T_2.*
2. *http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/chronology/petroleumchronology2000.htm.*
3. *http://www.earthday.net/about.*
4. *http://www.energystar.gov/index.cfm?c=about.ab_index.*
5. *http://www.energystar.gov/index.cfm?c=about.ab_index.*
6. *http://www.usgbc.org/News/USGBCInTheNewsDetails.aspx?ID=3795.*
7. U.S. Green Building Council, Green Building Facts – Green Building by the Numbers (USGBC September 2008) *http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1718.*
8. *http://www.eia.doe.gov/oiaf/1605/flash/flash.htm.*
9. *http://www.usgbc.org/News/USGBCInTheNewsDetails.aspx?ID=3795.*

The Impact of U.S. Fuel Consumption, Communting Patterns and Vehicle Miles Traveled on the Environment: Perspective Two

THE IMPROVEMENT IN FUEL ECONOMY and of reduction of emissions from vehicles has been one of the earliest environmental battlegrounds. In 1975, the Corporate Average Fuel Economy (CAFE) standards were established by the Energy Policy and Conservation Act (EPCA) of 1975[1] as a means of reducing U.S. dependence on foreign oil. CAFE set, as national policy, the average miles per gallon (MPG) that passenger cars and light trucks sold by U.S. manufacturers must attain. When enacted, CAFE established a 14.6 miles per gallon (MPG) level for combined car and light truck fuel economy.

The CAFE standards presented major technology challenges for automakers and required tremendous investments over a sustained period of time in order to meet the ever increasing mileage performance of vehicles.[2] The standards—and their constant revision upward—has been one of the great successes of the EPA in the U.S. The MPG performance of passenger cars increased from 14.0 MPG in 1975 to 22.4 MPG in 2007,[3] resulting in a nearly 20 percent reduction in gasoline use per passenger vehicle. Unfortunately, at the same time the number of vehicle miles traveled (VMT) also increased from 9,309 in 1975 to 12,427[4] miles in 2007, wiping out nearly all of the efficiency improvements. This was caused by the explosive growth of the ex-suburbs, the popularity of SUVs and trucks, and increased commuting distances.

Over the past 50 years, "sprawl" has become the most common land-use pattern as the population fled cities for safer communities, better schools and lower land/housing prices.[5] The spread of low-density residential subdivisions, commercial strips, large retail complexes surrounded by acres of parking, office parks far from home and shops, and a growing network of roads to link them has led to an increase in demand for vehicles and more VMT. We now drive further to shop and work, and we are more likely than ever to drive alone rather than carpool, take public transit or walk to work. The number of people who drove to work alone rose from 64–76 percent between 1980 and 2000. During that same period, the share that carpooled fell from 20–12 percent.[6] Certainly, standards over and above CAFÉ's are needed to reduce fossil fuel emissions and VMT. ■

ENDNOTES

1. *http://uscode.house.gov/download/pls/49C329.txt.*
2. Statement of the Alliance of Automobile Manufacturers before the U.S. House of Representatives Committee on Energy and Commerce, (Subcommittee on Energy and Air Quality, June 7, 2007).
3. *http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.d0b5a45b55bfbe582f57529cdba046a0/.*
4. Energy Information Administration, *Annual Energy Report,* 2007, Table 2.8 "Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates, Selected Years, 1949-2007," (U.S. Department of Energy, 2008) *http://www.eia.doe.gov/emeu/aer/pdf/pages/sec2_23.pdf.*
5. Elena G. Irwin, "The Effects of Open Space on Residential Property Values." (*Land Economics*, 2002).
6. Alan Pisarski, "Commuting in America III: The National Report on Commuting Patterns and Trends," (Transportation Research Board, 2006).

Density, Site Selection and Being Green: Perspective Three

ONE STRIKING EXAMPLE OF THE SOLUTION that dense in-fill and high-rise development can provide to the issue of VMT is the Chicago Downtown condominium development boom. Since the 1950s, the City of Chicago has seen a flight of residents from the city to the suburbs. However, within the downtown urban core, the opposite has been true. From 1994 to 2007, more than 48,765 new dwelling units were constructed, resulting in a population increase of nearly 80,000 residents.[1] Much of this growth occurred within the urban core consisting of a two-mile square centered on the Chicago Loop. With an average parking ratio of one car per unit (zoning of not-to-exceed 0.55 cars per unit for 15,765 units, and 1.25 cars per unit for 34,242 units; and 10,686 units with no parking spaces), a total of 48,765 automobiles are garaged in the new residences. Compared with or in contrast to the same households located in the suburbs, with an average of two cars per household, the urban living choice saved more than six-hundred million VMT per year. That savings assumes the downtown resident will still use a vehicle at the same average rate, as the suburban driver at 12,247 VMT per year.

Long before LEED was established, governments were committed to reducing the demand for new infrastructure and reducing VMT. Early on in the implementation of conservation measures and environmental analysis of new buildings, laws and regulatory process were the primary tools used to address environmental goals and concerns. The rise of the Environment Impact Statement (Federal) and Environmental Impact Report (California) drew the attention and effort of designers, developers and owners as they sited and proposed new buildings and defended a project's impact on the environment. These requirements were expensive and time-consuming, and necessitated a great deal of public involvement. However they also depended upon measurable elements such as storm water flow, traffic creation/demand, air quality, water use, land use and impact to surrounding landowners and communities (shadow, noise, light and heat island effect). As "negative" as the industry may be to these requirements, they are based upon measurable inputs and outputs.

The impact of site selection on the environment can be seen in two projects in the Chicagoland area.

Project 1 is a new construction, 73-story condominium building located in the East Loop of downtown Chicago. Located on a site of 29,000 square feet, the project redevelops underutilized, obsolete buildings within the existing city infrastructure. It is directly located on the Chicago Transit Authority (CTA) Orange, Brown, Green and Pink Lines, and bus routes. It is also served by existing roadways, water, sewer, electrical and gas systems, requiring no construction of new infrastructure. The building has 357 residential units, 40,000 square feet of university classroom space and 469 parking (less than 1.25 cars per unit) spaces. Because the building is located in the center of the downtown business and cultural district, it offers the opportunity for residents to reduce or eliminate lengthy commutes to work, and the use of motor vehicles. The project incorporates on-site storm water control systems, green roofs and "skygardens," ENERGY STAR appliances, and is designed to modern energy and conservation standards, including ASHRAE 90.1-2004. This building achieves a 35 percent improvement in energy use (a result of curtain wall vs. punch windows) over a nearly identical building designed, developed and completed just two years prior. The building also incorporates District Cooling through the Chicago Thermal District Cooling Plant.[2] This enables the building to take advantage of chilled water produced with off-peak electrical power, delivering significant energy savings to the residents and reduction of cooling systems and equipment from the building.

Despite the significant environmental performance of both the building and the location, the developer chose not to seek LEED certification. The USGBC Rating System lacks recognition for site selection of dense high-rise buildings, for energy systems, and for performance results when compared to less meaningful material and design features. An example is the ability to score one point for conducting measurement and verification of the performance of the engineered systems of the project. Meeting this criteria would have required the investment of up to a million dollars to measure and test the building performance, all to acquire just a single point. It was much easier to install bike racks and achieve the same point. The significance of the Thermal Energy approach also did not garner sufficient importance in the LEED scoring criteria. This imbalance in importance of certification criteria, along with the lack of more significant credit for situating the project on a small site in the center of the business district, was disheartening and rendered the pursuit of LEED certification to be of little relevance to the greater goal of improving the environment.

Project 2 is a suburban conservation community built upon a green site (formerly a farm) located more than 40 miles northwest of downtown Chicago. Many of the community's residents work in the City of Chicago. This suburban reserve established sustainable planning and construction standards for the development, including the creation and preservation of open space, incorporation of ENERGY STAR appliances, and a site location near a commuter rail station. The development provides 359 single-family homes and 36 condominium units on 677 acres, 350 of which are protected from development. Other development patterns in the same suburban area would have resulted in the development of a total of 2,400 homes on the same property. To develop the new conservation community, new roadways, sewer, water, gas, electrical and telecommunication infrastructure had to be constructed, along with complex storm water systems. The housing was built to U.S. Department of Energy Green Building standards, and a Charter School includes one building that is certified LEED Gold. The aesthetic design and high quality of construction of the community has attracted great interest and high property values.

The community also is located approximately five to ten miles from adjacent towns and major shopping locations, requiring significant automobile travel for local shopping and entertainment. The adjacent commuter rail service provides an easy option for residents to commute to work in the city, but Metra, which tracks ridership,[3] estimates that only 8–17 percent of residents use the northwest lines serving this community, leaving more than 80 percent of the residents commuting via automobile to workplaces that are between five and forty miles from the development.

There is no comparison between the two projects when considering land use, impact on carbon footprint, new infrastructure requirements and the reduction of VMT. ■

ENDNOTES

1. Appraisal Research Counselors, 4th Quarter 2007 *Downtown Chicago Residential Benchmark Report* (Appraisal Research Counselors, 2008).
2. *http://www.thermalchicago.com/.*
3. Neighborhood Capital Budget Group, "Evaluating the Capital Spending and Equity of Service of the Metra Commuter Rail System," (Campaign for Better Transit, 2006), *(http://www.juliehamos.org/transit/ documents/02-09-06/ Evaluating%20Capital%20Spending% 20at%20Metra.pdf.*

The Green Guide and the FTC: Perspective Four

Despite the rise of trusted labels like ENERGY STAR®, green marketing practices offering products that were "environmentally friendly" or recycled, or had other unsubstantiated positive environmental impact, grew. This created concern over marketing efforts for these "green" products, and led to the loss of public confidence in conservation efforts. The National Association of State Attorneys General examined the regulation of environmental claims and issued its Green Report (I and II).[1]

In part, this led the federal government to threaten litigation while at the same time the Federal Trade Commission (FTC) issued the Green Guides[2] to help marketers avoid making erroneous environmental claims that could be unfair or deceptive under Section 5 of the Federal Trade Commission Act.[3] The FTC published revisions to these marketing standards in 1996,[4] and again in 1998.[5]

Although it had been illegal to make false marketing

claims as to the benefits of a marketed product, the Commission decided to strengthen its ability to take action under the FTC Act if a business made environmental marketing claims inconsistent with the Green Guides. In any such enforcement action the Commission must prove that the act or practice at issue is unfair or deceptive.[6] The Green Guides outline general principles that apply to all environmental marketing claims and then offer guidance regarding specific environmental claims. For all marketing claims, the Guides advise: "…that qualifications and disclosures be sufficiently clear and prominent to prevent deception; that marketers make clear whether their claims apply to the product, the package or a component of either; that claims not overstate an environmental attribute or benefit, expressly or by implication; and that marketers present comparative claims in a manner that makes the basis for the comparison sufficiently clear to avoid consumer deception."

Like the "green" claims in products and within the automobile industry, the emergence of green and sustainable building practices has led to a similar concern over marketing claims of deceptive practices related to such buildings and the use of USGBC LEED Certification and Trademark on projects and products. As a result, the Commission reviewed the USGBC process and rating systems and brought together industry leaders to examine developments in green building and product/building claims, as well as consumer perception of such claims. In November 2007, the Commission published its *Guide for the Use of Environmental Marketing Claims*[7] and began conducting workshops with the industry. In May 2008,[8] USGBC responded to the Commission review of the industry use of LEED certifications and recognition stating: "…specifically, USGBC recommends the addition of language clarifying that marketers should take caution when using logos and seals awarded for a specific purpose to be sure that they do not indicate approval or endorsement of environmental attributes that have not actually been evaluated by the certifying program. This is particularly important in cases in which logos or seals address some, but not all, aspects of a product or service. For example, although USGBC provides third-party certification of buildings through LEED, it does not certify individual products or building components as "green" or "environmentally friendly." Despite this fact, some marketers have used the USGBC logo on product packaging and in advertisements alongside claims that products are certified by USGBC or LEED, or can be used to achieve LEED credits. Claims of this kind mislead consumers and pose similar challenges to third-party certifiers who are unknowingly linked to products they have not, in fact, reviewed or endorsed." In response, the Commission discourages environmental marketers from making claims that cannot be substantiated or proven. ■

ENDNOTES

1. *http://www.naag.org/.*
2. 16 CFR Part 260 *http://www.ftc.gov/bcp/grnrule/guides980427.htm.*
3. Federal Trade Commission Act, 15 U.S.C. 45.2, *http://www.ftc.gov/ogc/FTC_Act_IncorporatingUS_SAFE_WEB_Act.pdf.*
4. 61 Federal Register 53311.
5. 63 Federal Register 24240.
6. 15 U.S.C. Sections 41-58, Part 260.6 "General Principals."
7. 16 CFR Part 260.
8. *http://www.ftc.gov/os/comments/greenpkgworkshop/534743-00027.pdf.*

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