Senate Committee on Environment and Public Works
"Green Buildings: Benefits to Health, the Environment and the Bottom Line"
United States Senate
May 15, 2007

Written Testimony and Supporting Materials
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Chairman Boxer, Ranking Member Inhofe and members of the committee, thank you for the opportunity to showcase the benefits of green buildings, as well as highlight the work of the Green Building Initiative (GBI).

The Green Building Initiative is a not-for-profit, 501(c)(3) public charity dedicated to accelerating the practice of designing and maintaining more energy efficient, healthier and less environmentally-impactful buildings.

Our organization was founded in 2003, initially to facilitate the adoption of the National Association of Home Builders Model Green Home guidelines for residential construction. These guidelines, developed through an inclusive and rigorous process, are fast becoming the accepted approach for residential green building nationwide. The NAHB developed their guidelines by following procedures approved by the American National Standards Institute–or ANSI–and now are on a path to develop the first true consensus standard for residential green building. We are proud to work with the NAHB and commend them for their leadership in this area.

In addition to our work with the NAHB, we also offer systems to facilitate the sustainable design, development and maintenance of commercial buildings. Green Globes–widely used in Canada–was brought to the U.S. market by GBI. It is a portfolio of interactive, Web-based design and building performance tools that enable designers to evaluate environmental strategies for their buildings and achieve ratings that are verified by an independent third-party. A full description of these tools, their origins and our third party assessment processes are included below.

The creation of the GBI and the groundbreaking work of the NAHB not only complements the good work of other private organizations such as the U.S. Green Building Council, but also creates a very healthy and competitive dynamic that has served to stimulate some exciting advancements in the green building arena. These include:

- Movement toward the development of true consensus standards for green building. The GBI became the first organization of its kind to subject a rating system to the rigors of an independent, third-party, codified and consensus process under the rules of the ANSI. Other organizations have since pursued a similar path.
- The creation of practical, user-friendly tools to allow owners and designers to consider the "cradle-to-grave" environmental impact of materials used in construction. With life cycle assessment tools recently developed by the GBI, designers can now make

decisions based on the energy, air, water, solid waste and climate change impacts of more than 400 commonly used building assemblies. We're incorporating this data into our own rating system, and we've also offered it free of charge to any other rating organization or government entity that would like to utilize it.

- Stimulating the increased use of technology in green assessment. The Green Globes interactive platform has helped make green design and assessment both cost-effective and user-friendly. This has made it possible for a greater number of projects to be built to green standards and has encouraged the increasing use of technology in other rating systems.

As this committee begins the important work of developing policy to help green the nation's built environment, I would offer several observations for your consideration.

1. Green design is vitally important, but it is only part of the equation. Effective building operation and maintenance is necessary to ensure a sustainable built environment. Just as one can purchase a superbly designed vehicle, performance will greatly depend on how often one changes the spark plugs, rotates the tires and drives in for a tune up. The same principle applies to buildings. That's why the GBI offers Green Globes tools to facilitate and certify building design as well as building operation and maintenance.

2. While environmental attributes—such as durability, recycled content and short term renewability–are all important considerations, we must ultimately make decisions about the products we use based on a sound understanding of their lifetime environmental impact. Good life cycle assessment data can help to achieve our goals of carbon neutral buildings.

3. Finally, buildings are a big contributor to the problem of climate change. Public policy should harness the powers of competition to help the building sector contribute to a solution. Organizations such as the GBI, the NAHB, the American Society of Heating, Refrigerating and Air-conditioning Engineers, the National Institute of Standards and Technology, ASTM International and the US Green Building Council are all working in various ways to develop approaches to measure, incentivize and promote green building. This competitive dynamic has already stimulated improvement in the field and is essential for the further advancement of the green building movement.

Green Building Initiative Background

The Green Building Initiative (GBI) is a 501(c)(3) non-profit education organization based in Portland, Oregon. It was established to accelerate the adoption of sustainable design and construction practices by promoting credible and practical approaches to green building for both residential and commercial construction.

I serve as President at the discretion of an independent, multi-stakeholder board of directors comprised of construction professionals, product manufacturers, non-profit organizations, university officials, and other interested third parties. Each board member is allocated one vote to guide the GBI, ensuring an equal balance of influence. For a list of board members, please visit our Web site at www.thegbi.org.

In terms of funding, the GBI has benefited from the early support of a core group of industries that are committed to advancing the green building movement by creating a variety of credible options for their builder customers. Since our inception, we have also worked tirelessly to diversify our financial base through membership, training and other initiatives. You can view the GBI's complete list of funders at www.thegbi.org.

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We have also long recognized the power of collaboration and have tried to foster relationships with a variety of organizations related to the built environment to help accelerate the acceptance of sustainable design and construction in the marketplace. Some of the organizations that we have worked with include:

- American Institute of Architects
- National Association of Home Builders
- Associated General Contractors of America
- Sustainable Buildings Industry Council
- U.S. Conference of Mayors
- Building Owners and Managers Association

The Mission of the GBI

The GBI is committed to helping promote green building by offering credible and practical solutions to make green design, management and assessment more accessible to a wider population of builders and designers

For residential construction, the GBI has a unique strategic partnership with the NAHB. Our role is to promote the NAHB Model Green Home Building Guidelines to residential construction professionals, and to work with NAHB chapters, called home builder associations, to develop and populate local green building programs based on the national guidelines. We provide technical assistance, promotional and marketing support, host educational seminars for builder members, and conduct market research in an effort to spur sustainable development, as well as consumer demand for green homes. To date, in partnership with the NAHB and their local affiliates, the GBI has helped to develop and launch local and state green building programs in 15 major markets across the country. For a list of these programs, please visit www.thegbi.org.

For commercial construction, the GBI owns the rights to promote and distribute the Green Globes environmental assessment and rating system, which was originally developed for the Canadian marketplace. Green Globes is a revolutionary green management tool that features an assessment protocol, rating system and guide for integrating environmentally friendly design into commercial buildings. It features modules for New Construction and the Continual Improvement of Existing Buildings and facilitates recognition of completed projects through third-party verification. The system is successful because it is rigorous, yet easy to use and affordable. Due to its unique, Web-based platform, the detailed information and references users need to design sustainable, energy-efficient buildings are embedded within the system providing the most relevant information at exactly the time it is needed.

Innovation and Competition

The rating systems we promote–NAHB Model Green Home Building Guidelines for residential construction and Green Globes for commercial construction—have helped accelerate the adoption of green building practices by driving advancements in green building rating systems.

In addition to supporting the diversity of buildings and building professionals, we believe that competition will continue to do for green building what it has done in countless other areas -- drive improvements, lower costs and benefit the ultimate consumer, which in this case, is our shared environment.

The following initiatives are explained in more detail below, but, in the last two years alone, GBI:

- Became the first green building organization to be accredited as a Standards Developing Organization (SDO) by ANSI and is well into the process to establish our Green Globes system, as the first commercial green rating system to become an ANSI standard.

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- Began pilot testing Green Globes for the Continual Improvement of Existing Buildings to strengthen the link between sustainable design objectives and actual building performance,
- Developed the first tool for integrating life cycle assessment (LCA)—considered to be the most effective way to compare the environmental impacts of building materials and assemblies—into a green rating system, and
- Chose to advance the green movement as a whole by supporting the development of a generic version of our LCA tool—the ATHENA® *EcoCalculator for Assemblies*—which will soon be available from the ATHENA Institute, free of charge, to the entire sustainable design community.

GBI's status as an innovator was also reinforced by the AIA's and Architecture 2030's recent call for climate change legislation based on energy data generated through the Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS). Widely considered to be the most accurate and reliable source of energy benchmarking information, GBI and the EPA's Energy Star program are the only rating systems that rely on this important database. Green Globes is unique in its emphasis on using CBECS for both its design and existing buildings modules—where it serves as the system's benchmark for measured reductions in energy consumption.

Green Globes – History and Credentials

The Green Globes environmental assessment and rating system represents more than nine years of research and refinement by a wide range of prominent international organizations and experts.

The genesis of the system was the Building Research Establishment's Environmental Assessment Method (BREEAM), which was brought to Canada in 1996 in cooperation with ECD Energy and Environment. Pioneers of this project included Jiri Skopek, John Doggart and Roger Baldwin, who were the principal authors of the BREEAM Canada document.

In 1996, the Canadian Standards Association (CSA) published BREEAM Canada for Existing Buildings. More than 35 individuals participated in its development, including representatives from the following organizations:

- Bell Canada
- Carrier
- Canadian Construction Research Board
- Canadian Standards Association
- ECE Group
- Environment Canada
- Environmental Planning Institute of Canada
- Halozone, Inc.
- International Council for Local Environmental Initiatives
- Natural Resources Canada
- National Research Council
- Ontario Hydro
- Ontario Realty Corporation
- Tescor Energy Services, Inc.
- University of Toronto

In 1999, ECD Energy and Environment worked with TerraChoice, the agency that administers the Government of Canada's Environmental Choice program, to develop a more streamlined, question-based tool, which was introduced as the BREEAM Green Leaf eco-rating program. This program led to the development of Green Leaf for Municipal Buildings with the Federation of Canadian Municipalities later that year.

In 2000, BREEAM Green Leaf took another leap forward in its evolution, becoming an online assessment and rating tool under the name Green Globes for Existing Buildings. Also that year, BREEAM Green Leaf for the Design of New Buildings was developed for the Department of National Defense and Public Works and Government Services Canada.

In 2002, Green Globes for Existing Buildings was introduced online in the United Kingdom as the Global Environmental Method (GEM). Work also began to adapt BREEAM Green Leaf for the Design of New Buildings into the online Green Globes for New Buildings. Participants in this process included representatives from:

- Arizona State University
- Besto Group
- Building Owners and Manufacturers Association of Canada
- Canadian Construction Association
- Canadian Standards Association
- Department of National Defense
- DST Group
- Elia Sterling Associates
- Energy Profiles
- GWL Realty
- MCMP Architects
- Natural Resources Canada
- Public Works and Government Services Canada
- Stewart Energy
- TerraChoice
- The ATHENA Institute

In 2004, Green Globes for Existing Buildings was adopted by the Building Owners and Manufacturers Association of Canada (BOMA) under the name *Go Green Comprehensive* (now *Go Green Plus*). Since then, the Canadian federal government has adopted *Go Green Plus* as a green management tool for its portfolio of more than 500 existing buildings. It is also integral to the Ontario Power Authority's program for energy retrofits, and is used by most major property management firms.

Green Globes and the Green Building Initiative

In 2004, the GBI acquired the rights to distribute Green Globes for the Design of New Buildings in the United States. In adapting the system for the U.S. market, the only changes made were those necessary to make the system appropriate for the U.S. market (e.g. converting units of measurement and integration with the US Energy Star program).

However, we have since committed ourselves to ensuring that Green Globes continues to reflect best practices and ongoing advances in research and technology.

To that end, the GBI sought and received accreditation as an ANSI standards developer and began the consensus-based process of establishing Green Globes as the first ANSI standard for commercial green building. As part of the process, the GBI established a technical committee and

sub-committees featuring nearly 100 building science experts, including representatives from four federal agencies, states, municipalities, universities and leading construction firms, as well as building owners. A complete list is available at www.thegbi.org.

As part of the ANSI process, the GBI has relinquished control of the Green Globes tool to the technical committee, which will determine the final standard without influence from the GBI board of directors, funders or staff.

About Green Globes

Although many green building tools claim to be Web-enabled, this is typically limited to providing online information and templates. Green Globes' use of Web tools is far more complex, and offers a fully interactive experience.

Once an online questionnaire is completed, the system generates a point score and project design highlights. is the report generated includes an educational component, which highlights sustainability attributes of the building and provides detailed suggestions for improvements that should result in a reducing the building's overall environmental impact. This is supported by hot-links to further information regarding best design practices and standards or specific information on building systems and materials. Links are selected to provide educational information, government references, NGOs, and industry research relevant to each stage of project delivery and helps users achieve a better high performance design and higher Green Globes score.

Projects are awarded up to 1,000 points based on their performance in seven areas of assessment:

1. **Project Management – 50 Points**

   The Green Globes system places an emphasis on integrated design, an approach that encourages multi-disciplinary collaboration from the earliest stages of a project while also considering the interaction between elements related to sustainability. Most decisions that influence a building's performance (such as siting, orientation, form, construction and building services) are made at the start of the project and yet it's common, even for experienced designers, to focus on environmental performance late in the process, adding expensive technologies after key decisions have been made. This is costly as well as ineffective.

   To ensure that all of the relevant players are involved, the system tailors questionnaires so that input from team members is captured in an interactive manner, even on those issues which may at first appear to fall outside their mandate. For example, while site design and landscaping may come under the purview of the landscape designers, the questionnaire prompts the electrical engineer to get involved with design issues such as outdoor lighting or security. Thus the Green Globes format promotes design teamwork and prevents a situation where, despite strong individual resources, the combined effort falls short.

   Also included under project management are environmental purchasing, commissioning, and emergency response.

2. **Site – 115 Points**

   Building sites are evaluated based on the development area (including site selection, development density and site remediation), ecological impacts (on ecological integrity, biodiversity, air and water quality, microclimate, habitat, and nocturnal fauna and flora),

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watershed features (such as site grading, storm water management, pervious cover and rainwater capture), and site ecology enhancement.

3. **Energy – 360 Points**

To simplify the process of energy performance targeting, Green Globes directs users to the Web interface used for the Energy Star Target Finder software, which helps to generate a realistic energy consumption target. As a result, an aggressive energy performance goal can be set—with points awarded for design and operations strategies that result in a significant reduction in energy consumption—as compared to actual performance data from real buildings.

As previously stated, Green Globes is the only green rating system to use energy data generated through the DOE's Commercial Buildings Energy Consumption Survey (CBECS), which is widely considered to be the most accurate and reliable source of energy benchmarking information.

In addition to overall consumption, projects are evaluated based on the objectives of reduced energy demand (through space optimization, microclimatic response to site, day lighting, envelope design and metering), integration of "right sized" energy-efficient systems, on-site renewable energy sources, and access to energy-efficient transportation.

4. **Water – 100 Points**

Projects receive points for overall water efficiency as well as specific water conservation features (such as sub-metering, efficiency of cooling towers and irrigation strategies), and on-site treatment (of grey water and waste water).

5. **Resources – 100 Points**

The resources section covers building materials and solid waste. It includes points for materials with low environmental impact (based on life cycle assessment), minimal consumption and depletion of resources (with an emphasis on materials that are re-used, recycled, bio-based and, in the case of wood products, certified as having come from sustainable sources), the re-use of existing structures, building durability, adaptability and disassembly, and the reduction, re-use and recycling of waste.

6. **Emissions, Effluents and Other Impacts – 75 Points**

Points in this section are awarded in six categories, including air emissions, ozone depletion and global warming, protection of waterways and impact on municipal waste water treatment facilities, minimization of land and water pollution (and the associated risk to occupants' health and the local environment), integrated pest management, and the storage of hazardous materials.

7. **Indoor Environment – 200 Points**

According to the US Environmental Protection Agency (EPA), indoor air can be up to 10 times more polluted than outdoor air, even in cities where the quality of outdoor air is poor. This has obvious health implications, but the consequences are also economic. A study by Lawrence Berkeley National Laboratory found that improving indoor air at work could save US businesses up to $58 billion in lost sick time each year, with another $200 billion earned in increased worker performance.

This section evaluates the quality of the indoor environment based on the effectiveness of the ventilation system, the source control of indoor pollutants, lighting design and the integration of lighting systems, thermal comfort and acoustic comfort.

Projects that achieve a score of 35% or more become eligible for a Green Globes rating of one, two, three or four globes, as follows:

- One Globe: 35-54%
- Two Globes: 55-69%
- Three Globes: 70-84%
- Four Globes: 85-100%

However, buildings cannot be promoted as having achieved a Green Globes rating until the information submitted has been third-party verified by a qualified and authorized individual assessor.

The GBI currently oversees Green Globes-trained verifiers comprised primarily of licensed architects and engineers with significant experience in building sciences and sustainability issues. The Green Globes third-party verification process features a rigorous two-stage approach.

Stage I can be initiated by the design team as soon as the Construction Documents questionnaire is finalized. The completed questionnaire is verified against the documentation generated throughout the design process and, providing the building is on target to achieve a minimum of 35% of the 1,000 possible points, the design team receives a Certificate of Achievement. However, a final rating cannot be achieved until after a Stage II verification, which occurs post-construction. Stage II includes a site visit and walk-through by the third-party verifier and can be initiated as soon as construction is complete.

To further strengthen our third-party verification program, the GBI recently announced an agreement with CSA America, Inc., a leading developer of standards and codes, to develop an independently accredited Green Globes Personnel Certification Program. CSA America is developing the program on behalf of GBI for assessors using the Green Globes system to verify achievements in the design and operation of green buildings. It is the industry's first independently administered certification program for third-party verifiers of green buildings.

Green Globes and Life Cycle Assessment (LCA)

The green building movement is experiencing a fundamental shift in the way it approaches sustainable design, away from a prescriptive methodology—whereby materials are assumed to have environmental benefits based on rapid renewability, recycled content or other attributes—toward one that emphasizes measurable performance. Life cycle assessment (LCA) is a means to this end because it allows the impartial comparison of materials, assemblies and even whole buildings, from cradle-to-grave, in terms of quantifiable impact indicators such as global warming potential.

LCA is widely accepted in the environmental research community as one of the best ways to assess building sustainability, but its use has been limited by the perception that it's too complex or time consuming for mainstream practitioners. Now, thanks to a new tool commissioned by the GBI, LCA is more accessible than ever before to architects, engineers, policy makers, manufacturers and developers, regardless of environmental design experience.

Developed for use with the Green Globes system, the new tool provides instant LCA results for more than 400 common building assemblies in low- and high-rise categories—including exterior

walls, roofs, intermediate floors, interior walls, windows, and columns and beams. It was created by the ATHENA Institute in association with the University of Minnesota's Center for Sustainable Building Research and Morrison Hershfield Consulting Engineers. ATHENA's widely acclaimed *Impact Estimator for Buildings* was used to generate the results embedded in the tool.

The tool is currently being reviewed by the ANSI technical committee prior to its integration into Green Globes. However, recognizing its importance as an indicator of climate change impacts, GBI supported the team's creation of a generic version for use by the entire sustainable design community. This version will soon be available, free of charge, from the ATHENA Web site (www.athenasmi.ca), and we are encouraging its use among other green building organizations and universities, and at all levels of government.

Green Globes and Other Rating Systems

There is a great deal of agreement as to what constitutes best energy and environmental practices, so the major green building standards and rating systems have more similarities than differences.

For example, a team of independent researchers at the University of Minnesota recently published the results of a three month intensive analysis of Green Globes and LEED.

The report, "Green Building Systems: A Comparison of the LEED and Green Globes Systems in the US," is available on the GBI Web site (www.thegbi.org/gbi/Green_Building_Rating_UofM.pdf). It provides a detailed comparison of how the systems operate as well as their respective strengths and weaknesses.

Among its conclusions, the report states that "in total the systems are quite similar," and that "both include a common set of potentially impactful design elements that contribute to the improvement of a building's green performance."

The study also found that nearly 80% of the categories available for points in Green Globes are also addressed in LEED 2.2 and that over 85% of the categories specified in LEED 2.2 are addressed in Green Globes.

It concluded that, while comparing the two systems is extremely difficult, there are a number of trends "worth noting." Included in this summary were the following three points:

- Green Globes "appears to be doing a fairly good job in improving upon the delivery mechanisms employed by LEED which are so often criticized," by providing an online approach to assessment that improves efficiency and reduces costs,
- Green Globes better integrates life-cycle thinking into its rating system, and
- The GBI, as an accredited standards developer under the American National Standards Institute (ANSI) "will undoubtedly enhance Green Globes presence in the marketplace" by undergoing the consensus-based process associated with creating an official ANSI standard for green building practices.

In addition, the study revealed some "moderate dissimilarity" in point allocations in the two systems, pointing out that "Green Globes emphasizes energy use above all other categories. In contrast, LEED allocates comparatively more points to the Materials section." It reported that areas such as indoor environmental quality, resources, and site ecology are similarly emphasized by both systems, and that Green Globes employs a rating criterion that reflects life-cycle thinking and covers the entire life-cycle of building materials.

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It also stated that, "from a process perspective, Green Globes' simpler methodology, employing a user-friendly interactive guide for assessing and integrating green design principles for buildings, continues to be a point of differentiation to LEED's more complex, and largely paper-based system. While LEED has recently introduced an online-based system, it remains more extensive and requires expert knowledge in various areas. Green Globes' Web-based self-assessment tool can be completed by any team member with general knowledge of the building's parameters." The researchers added that, "in contrast, LEED tends to be more rigid, time-intensive, and [more] expensive to administer."

Aside from the fundamental similarities, the Green Globes system has a number of unique characteristics that make it an attractive option for those seeking a tool that's both rigorous and practical, at an affordable price. For example, Green Globes is:

Flexible
Designed for use on building projects of any size, Green Globes is suitable for everything from large and small offices and multi-family structures, to institutional buildings such as schools, universities and libraries.

Encourages Building Comparisons
Owners and developers with multiple properties can use Green Globes to assess and compare the buildings in their portfolio. As more and more buildings are Green Globes verified, point scores will also be aggregated in an anonymous database, enabling users to analyze how both their designs and existing buildings perform in relation to the median and to buildings that are similar in size, type and region.

Promotes Integrated Design
Green Globes facilitates the integrated design process, encouraging multi-disciplinary collaboration from the earliest stages of a project. The system guides design team members by reminding them of next steps and introducing the elements of sustainability in a logical sequence.

Facilitates Planning
Self-assessment occurs in two phases: during the schematic design stage (which corresponds with site plan approval) and during the construction documents stage (which typically corresponds with building permit approval). This allows design teams, clients and municipal authorities to review a detailed report that provides the percentage of points likely to be achieved (out of 1,000), highlights the project's environmental attributes, and suggests opportunities for improvement.

US Market Acceptance
To date, eight buildings have successfully completed Green Globes third-party verifications across the United States, with an additional 70 buildings in the pipeline.

Of those that have completed the verification process, four of the eight have also been certified under the USGBC's LEED program, and two are awaiting their final LEED certification. Because both systems have similar four tiered rating structures, these dual-certified buildings provide benchmark data demonstrating that while not identical, the systems are comparable—in terms of the final ratings and areas of assessment. They just take a different approach to reach the same goal.

Examples of dual-certified projects include:

- William J. Clinton Presidential Center (Little Rock, AR)
    - Two Green Globes; LEED Silver

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- Alberici Corporate Headquarters (St. Louis, MO)
    - Four Green Globes; LEED Platinum

- Blakely Hall (Issaquah, WA)
    - Two Green Globes, LEED Silver

- Pfizer Inc. Clinical Research Unit (New Haven, CT)*
    - Three Green Globes, LEED Silver

** This project received points for excellence in project management for their integrated design process, which were not available in LEED.*

Green Globes has also been formally recognized by the public and private sectors including:

- Formal recognition of Green Globes by six states in green building legislation and executive orders, including Arkansas, Connecticut, Hawaiii, Maryland, Pennsylvania and Wisconsin.

- Inclusion in the Fireman's Fund Insurance Company's Certified Green Building Replacement and Green Upgrade coverage package, which provides discounted rates for certified green buildings. (The Fireman's Fund is the only insurance company currently offering incentives for green commercial buildings.)

- Indications from several federal agencies, including the Department of Health and Human Services (piloting Green Globes on the NIH building in Maryland and an Indian Health Services building in Arizona) and the Department of the Interior (piloting Green Globes on a building in New Mexico) that Green Globes provides unique benefits that made it worthy of adding into their formal sustainability policies.

Future of the GBI

The GBI has made tremendous strides in a short time—and we intend to continue leading science-based and technologically-advanced initiatives that allow us to bring to fruition important contributions on priority issues within the green building movement.

One contribution is to ensure that the those working with the existing built environment have a reliable, affordable and holistic tool for improving the energy efficiency of existing buildings, while considering other environmental impacts. It is critical that our nation make strides in improving our existing building stock and at the same time address the gap between design intent and actual building performance.

The unfortunate reality is that many buildings designed to be sustainable fail to perform as expected. There are logical reasons, such as the fact that design team predictions may have been based on ideal assumptions, while actual performance was diminished by unforeseen variables, such as moving budget targets, value engineering, or insufficient commissioning. But to a building owner that receives higher than expected utility bills or fails to achieve his or her energy reduction targets, the reasons matter less than the results.

What's been missing, until now, is a way to measure and monitor performance on an ongoing basis. That is why GBI is introducing Green Globes for Continual Improvement of Existing Buildings (Green Globes-CIEB).

There is an increasing demand for accountability—through mechanisms such as climate change legislation, which mandate energy and CO_2 reductions—and building owners are being called

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upon to improve building performance with verifiable results. They need to know quickly and reliably whether specific improvements are having the intended effects.

Green Globes-CIEB allows users to create a baseline of their building's performance, evaluate interventions, plan for improvements, and monitor success—all within a holistic framework that also addresses the building's physical and human elements such as material use and indoor environment.

In the context of climate change, energy is the most significant area of assessment within Green Globes-CIEB. A combined focus on energy use, building features and management helps to pinpoint where performance is lacking and what corrective action is required. The system uses the EPA's Portfolio Manager to determine a consumption target in k/Btus for each building type, and, where appropriate, buildings must meet a minimum performance target of 75 percent based on the comparable EPA Target Finder building.

Green Globes-CIEB is being pilot tested with the goal of demonstrating that it provides the combination of a credible baseline and guidance that allows users to plan with accuracy the interventions required to achieve measured reductions in energy consumption for existing buildings.

In the first six weeks after the launch of the pilot, the GBI registered 111 users and 34 buildings began the assessment process. At this time, more than 160 buildings are using this web-enabled assessment. This supports our belief, not only in the urgent need for practical and cost-effective tools such as Green Globes-CIEB, but in their ability to transform the market from one in which green building leads to valuable but imprecise benefits to one in which it defines the path for achieving specific and measured environmental goals.

Other GBI priorities include:

- Further integration of LCA into our suite of tools, including specific regional versions for the different climate zones across the country.

- Interactive tools that make it easier for home builders to learn about and adopt sustainable practices.

Thank you again for inviting the Green Building Initiative to participate in today's hearing. We look forward to the opportunity to work with all of the members of the committee to help make green building the norm, rather than the exception in residential and commercial construction.

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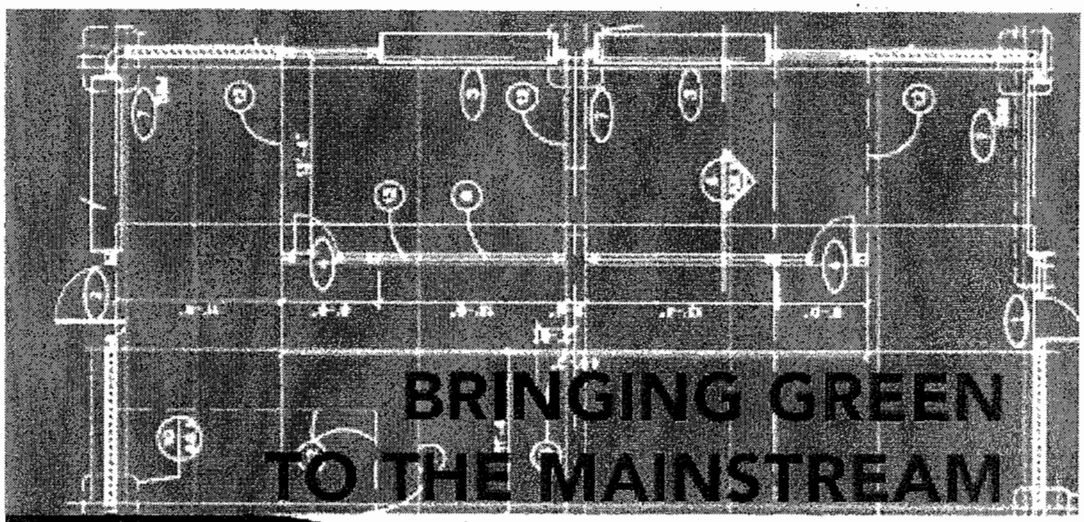
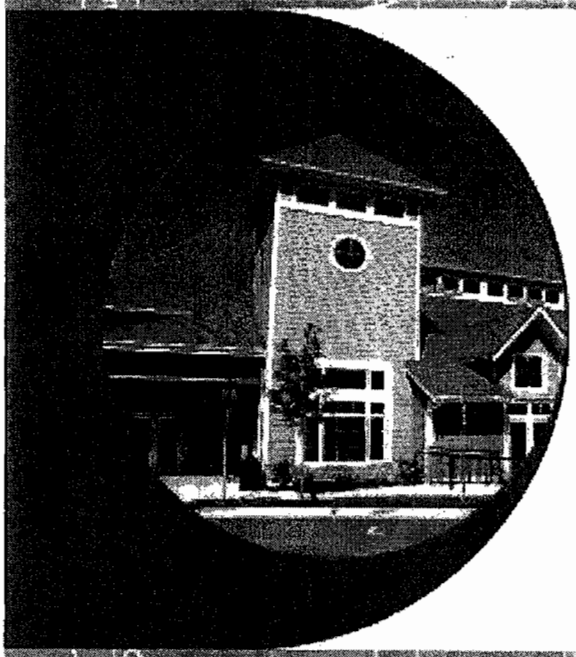
GBI Brochure



BRINGING GREEN TO THE MAINSTREAM



GREEN BUILDING INITIATIVE™

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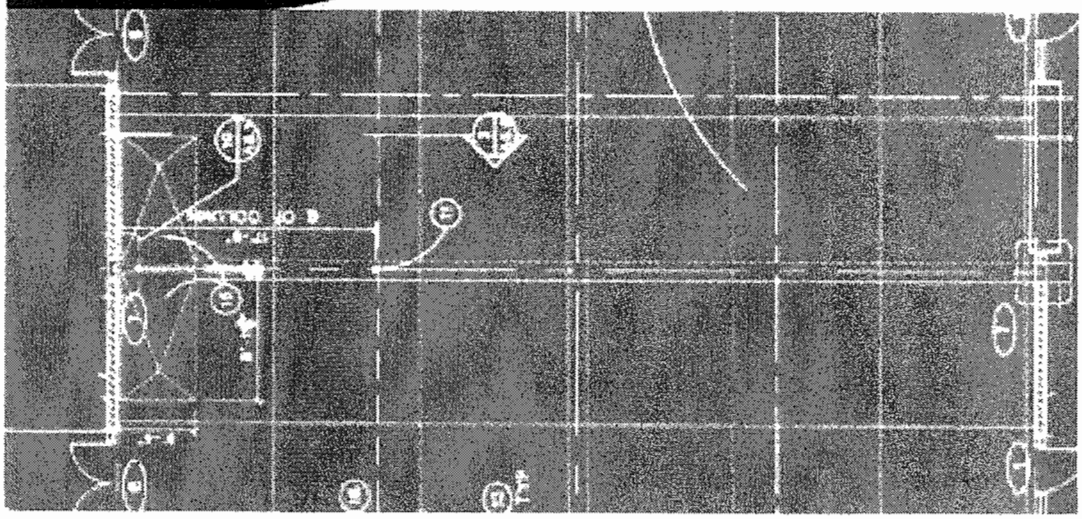

ABOUT THE GREEN BUILDING INITIATIVE™

VISION	We envision a future in which energy efficient, healthier and environmentally conscious construction is the norm instead of the exception.
MISSION	The mission of the Green Building Initiative is to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches for residential and commercial construction.
GOVERNANCE	The GBI is governed by an independent, balanced and diverse Board of Directors, comprised of producers, users and third parties.
CONSENSUS APPROACH	In 2005, the American National Standards Institute (ANSI) formally recognized the GBI as an accredited standards developer - making the GBI the first green building organization permitted to develop, maintain and withdraw American national standards. As such, the GBI is working to establish Green Globes™ as an official ANSI standard.

RESIDENTIAL GREEN BUILDING

The GBI has partnered with the National Association of Home Builders (NAHB) to raise awareness of the NAHB Model Green Home Building Guidelines. To accomplish this, we work with home builder associations across the country to develop locally-relevant green building programs based on the guidelines. We provide technical assistance, promotional and marketing support, host educational seminars for builder members, conduct market research and help increase local consumer demand for green homes.

COMMERCIAL GREEN BUILDING

In the U.S., the GBI owns the rights to distribute Green Globes, a revolutionary green management tool that includes an assessment protocol, rating system and guide for integrating environmentally friendly design into commercial buildings. Once complete, it also facilitates recognition of the project through third-party verification. Green Globes is an interactive, flexible and affordable approach to environmental design.

Life Cycle Analysis Information

GREEN BUILDING INITIATIVE™
www.thegbi.org
2104 SE Morrison
Portland, Oregon 97214
Phone: 877.GBI.GBI1
Fax: 503.961.8991
info@thegbi.org

For Immediate Release

Contact: Mike Gehrig
(312) 988-2065
mgehrig@thegbi.org

GREEN BUILDING INITIATIVE™ COMPLETES GROUNDBREAKING SOFTWARE FOR LIFE CYCLE ASSESSMENT

New Tool Measures Global Warming and Other Environmental Impacts of Building Assemblies

Portland, Ore. (January 24, 2007) – Designing a sustainable structure that minimizes greenhouse gas emissions and other environmental impacts will soon be easier, thanks to a new Life Cycle Assessment (LCA) tool developed by the Green Building Initiative (GBI) to compare alternate design scenarios.

LCA considers materials over the course of their entire lives and takes into account a full range of environmental impact indicators—including embodied energy, solid waste, air and water pollution, and global warming potential.

Developed primarily for use with the GBI's Green Globes™ environmental assessment and rating system, the new software tool provides LCA results for more than 400 common building assemblies in low- and high-rise categories—including exterior walls, roofs, intermediate floors, interior walls, windows, and columns and beams. It was created through a contract with Morrison Hershfield Consulting Engineers, in association with the University of Minnesota's Center for Sustainable Building Research and the Athena Sustainable Materials Institute. Athena's *Environmental Impact Estimator* software was used to generate the results embedded in the tool.

"This project is tied to the GBI objective of making green building more accessible to the mainstream design community," said Ward Hubbell, executive director of the GBI. "LCA is essential to green building because it allows the impartial comparison of materials, assemblies and even whole buildings, but it poses a challenge for many designers—in terms of complexity as well as time. Our intent is to simplify the process in order to facilitate informed choices."

- more -

Because the GBI has also initiated the process to establish Green Globes as an official standard under the American National Standards Institute (ANSI), the LCA tool must be reviewed by the ANSI technical sub-committee before being integrated into the web-based Green Globes system.

"Life Cycle Assessment represents a shift in the way rating systems have traditionally approached green building," said Wayne Trusty, president of Athena and chair of the GBI's ANSI technical committee. "Instead of rewarding materials or products for specific attributes, rating systems such as Green Globes are increasingly looking at performance measures, such as global warming potential, and giving designers the flexibility to choose how to achieve their environmental goals. LCA is a means to this end."

Once it is reviewed by the ANSI technical sub-committee, the LCA tool will be integrated into the Green Globes system. The GBI also intends to release the tool for general use by the broader design community, in order to encourage more people to design and build green.

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ABOUT THE GREEN BUILDING INITIATIVE: The mission of the Green Building Initiative is to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches. A not-for-profit education initiative, the GBI is supported by a broad cross section of organizations and individuals with an interest in residential and commercial construction. For more information on the Green Building Initiative, please visit www.thegbi.org.

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GREEN BUILDING INITIATIVE™ SHARES GROUND-BREAKING CLIMATE CHANGE CALCULATOR WITH ENTIRE GREEN BUILDING COMMUNITY

Portland, Ore. (February 26, 2007) — Last month, the Green Building Initiative (GBI) became the first organization in North America to develop a Life Cycle Assessment (LCA) tool for integrating the evaluation of building assemblies in green building rating systems. Today, GBI is announcing its intention to grant permission to its consulting team to offer a generic version, free of charge, to the entire sustainable construction community.

Developed for use with the GBI's Green Globes™ environmental assessment and rating system for commercial buildings, the new software tool measures the global warming potential and other environmental impacts of more than 400 common building assemblies in low- and high-rise categories. It was created by Morrison Hershfield Consulting Engineers in association with the University of Minnesota's Center for Sustainable Building Research and the Athena Sustainable Materials Institute, and features LCA results generated by the ATHENA® *Environmental Impact Estimator* software.

The tool is being reviewed by the GBI ANSI technical committee prior to its integration into Green Globes. However, recognizing the value of this one-of-a-kind climate change calculator to the entire North American building community, the GBI will be authorizing the Athena Sustainable Materials Institute to release a free generic version for use by other green building organizations, government entities, trade associations and universities.

- more -

"This tool is too important to keep to ourselves," said Ward Hubbell, executive director of the GBI. "Our mission is to make green building accessible to the mainstream design and construction community—and we see it as our duty to share important advancements for the betterment of the green building movement."

By making the tool available, other existing green rating systems (such as LEED® and the National Association of Home Builders' Model Green Home Building Guidelines), federal and municipal governments, and others will be able to use the tool as they strive to achieve goals related to the reduction of carbon dioxide emissions from buildings—which are widely accepted to be major contributors to global climate change.

"While the green building community has long recognized the value of LCA and encouraged its use, this is the first time that mainstream professionals will have streamlined access to crucial data on building assemblies," said Hubbell. "This tool gives the public and private sectors the information they need to make informed choices about assemblies based on climate change and other environmental impacts."

GBI's consultants plan to release the generic version of the tool as early as April, following technical input from GBI's ANSI committee. Organizations interested in acquiring a free copy of the LCA tool once released will find it on the Athena Sustainable Materials Institute website at www.athenasmi.ca.

LIFE CYCLE ASSESSMENT

LCA considers materials over the course of their entire lives and takes into account a range of environmental impact indicators—including embodied energy, solid waste, air and water pollution, and global warming potential.

"The use of life cycle assessment will represent a shift in the way rating systems have traditionally approached green building," said Wayne Trusty, president of Athena and chair of the GBI's ANSI technical committee." Instead of rewarding materials or products for specific attributes, LCA analyzes environmental performance measures, such as global warming potential, thus giving designers the flexibility to choose how to achieve their environmental goals."

For more information about Life Cycle Assessment or the new LCA tool, visit www.thegbi.org.

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ABOUT THE GREEN BUILDING INITIATIVE: The mission of the Green Building Initiative is to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches. A not-for-profit education initiative, the GBI is supported by a broad cross section of organizations and individuals with an interest in residential and commercial construction. For more information on the Green Building Initiative, please visit www.thegbi.org.

ABOUT THE ATHENA SUSTAINABLE MATERIALS INSTITUTE: The Athena Institute is dedicated to sustainability of the built environment, a goal that can only be achieved by meeting the building community's need for better information and tools. From its Canadian offices, and through its U.S. affiliate, Athena Institute International, the not-for-profit Athena organization undertakes and directs various research and development activities that make it possible to factor environmental considerations into the design process from the conceptual stage onward. For more information, please visit www.athenasmi.ca.

ABOUT MORRISON HERSHFIELD: Morrison Hershfield is a multidisciplinary engineering and management firm. Engineering and design build services are provided to clients in the transportation, building, life sciences, municipal, utilities and telecommunications sectors. For more information, please visit www.morrisonhershfield.com.

ABOUT THE UNIVERSITY OF MINNESOTA'S CENTER FOR SUSTAINABLE BUILDING RESEARCH: The Center for Sustainable Building Research (CSBR) was established as an official unit within the College of Design (formerly known as the College of Architecture and Landscape Architecture) in 2001 although the staff has been conducting building research since 1997. Sponsors of CSBR projects include the U.S. Department of Energy, and state agencies such as the Minnesota Departments of Natural Resources and Transportation, and the Office of Environmental Assistance. Other sponsors include building industry sources such as Aspen Research Corporation. For more information, please visit www.csbr.umn.edu.

University of Minnesota Study

UNIVERSITY OF MINNESOTA STUDY COMPARES GREEN BUILDING RATING SYSTEMS

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A team of independent researchers at the University of Minnesota led by Associate Professor Timothy M. Smith recently published the results of a three month intensive analysis of the two most prominent commercial building environmental assessment and rating systems in the United States, the Green Building Initiative's (GBI) Green Globes™ system and the U.S. Green Building Council's (USGBC) LEED® system.

The report, "Green Building Systems: A Comparison of the LEED and Green Globes Systems in the US," can be can be found by on the GBI website (http://www.thegbi.org/gbi/Green_Building_Rating_UofM.pdf). The study provides a detailed comparison of how the systems operate as well as their respective strengths and weaknesses.

The study stated that "in total the systems are quite similar," and that "both include a common set of potentially impactful design elements that contribute to the improvement of a building's green performance."

It also found that nearly 80 percent of the categories available for points in Green Globes are also addressed in LEED 2.2 and that over 85 percent of the categories specified in LEED 2.2 are addressed in Green Globes.

The study concluded that, while comparing the two systems is extremely difficult, there are a number of trends "worth noting." Included in this summary were the following three points:

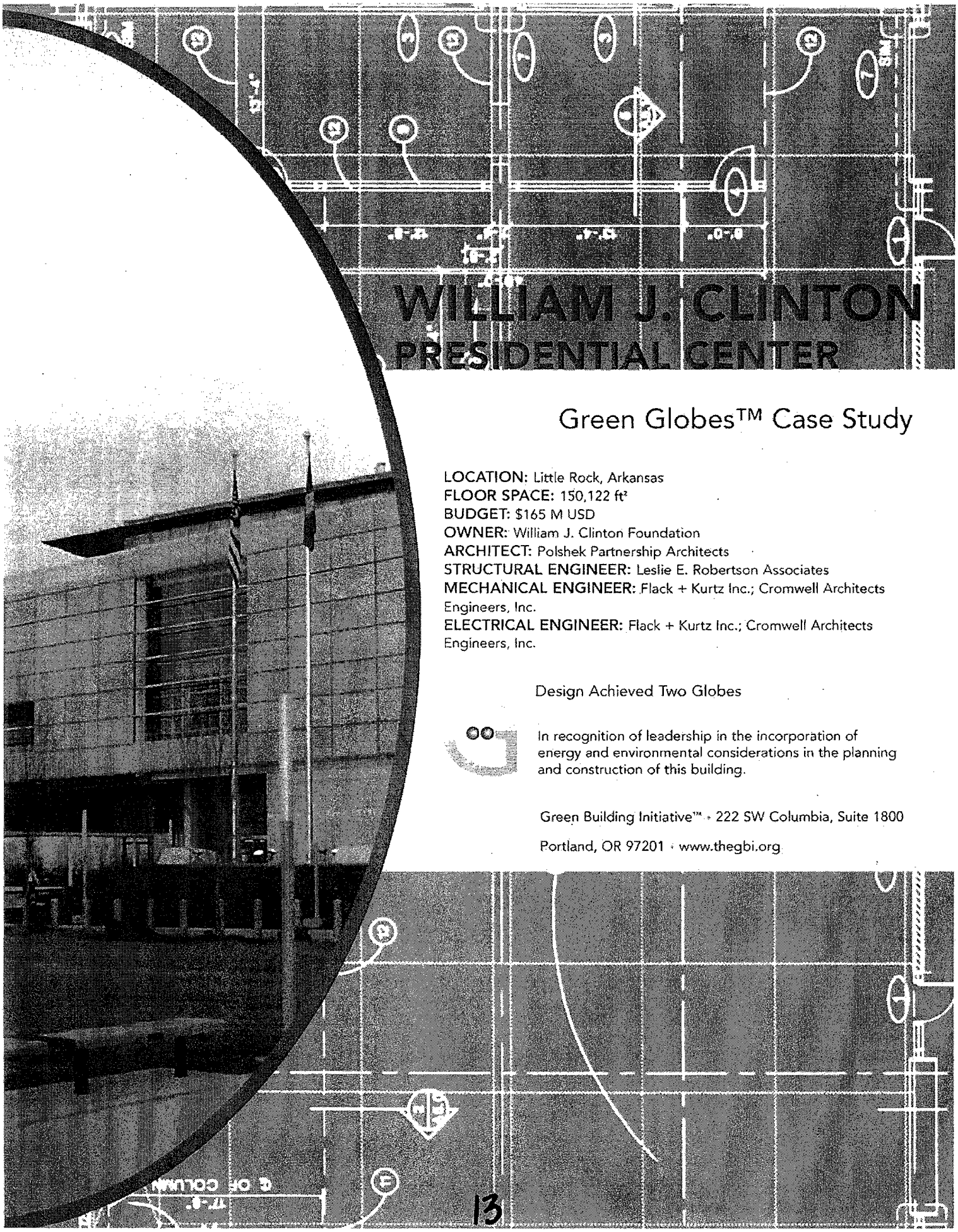
- That Green Globes "appears to be doing a fairly good job in improving upon the delivery mechanisms employed by LEED which are so often criticized," by providing an online approach to assessment that improves efficiency and reduces costs;
- That Green Globes better integrates life-cycle thinking into its rating system;
- And that the GBI, as an accredited standards developer under the American National Standards Institute (ANSI) "will undoubtedly enhance Green Globes presence in the marketplace" by undergoing the consensus-based process associated with creating an official ANSI standard for green building practices.

In addition, the study revealed some "moderate dissimilarity" in point allocations in the two systems , pointing out that "Green Globes emphasizes Energy Use above all other categories. In contrast, LEED allocates comparatively more points to the Materials section." It reported that areas such as indoor environmental quality, resources, and site ecology are similarly emphasized by both systems, and that Green Globes employs a rating criterion that reflects life-cycle thinking and covers the entire life-cycle of building materials.

It also stated that, "From a process perspective, Green Globes' simpler methodology, employing a user-friendly interactive guide for assessing and integrating green design principles for buildings, continues to be a point of differentiation to LEED's more complex, and largely paper-based system. While LEED has recently introduced an online-based system, it remains more extensive and requires expert knowledge in various areas. Green Globes' web-based self-assessment tool can be completed by any team member with general knowledge of the building's parameters." The researchers added that, "In contrast, LEED tends to be more rigid, time-intensive, and expensive to administer." To view an analysis of the process comparison, please visit http://www.thegbi.org/gbi/pdf/ProcessComparison.pdf.

For more information on the Green Globes system and the opportunity to try the system for free for 30 days, please visit http://www.thegbi.org/greenglobes/promocodes.asp.

Green Globes Case Studies



WILLIAM J. CLINTON PRESIDENTIAL CENTER

Green Globes™ Case Study

LOCATION: Little Rock, Arkansas
FLOOR SPACE: 150,122 ft²
BUDGET: $165 M USD
OWNER: William J. Clinton Foundation
ARCHITECT: Polshek Partnership Architects
STRUCTURAL ENGINEER: Leslie E. Robertson Associates
MECHANICAL ENGINEER: Flack + Kurtz Inc.; Cromwell Architects Engineers, Inc.
ELECTRICAL ENGINEER: Flack + Kurtz Inc.; Cromwell Architects Engineers, Inc.

Design Achieved Two Globes

In recognition of leadership in the incorporation of energy and environmental considerations in the planning and construction of this building.

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PROJECT NOTES

The William J. Clinton Presidential Center is a 150,000-square-foot building located in Little Rock, Arkansas. The building achieved Two Green Globes for its use of environmentally sensitive systems and low impact materials as well as the reuse of a previously underutilized industrial area.

PROJECT MANAGEMENT

Integrated Design Process (IDP)

- Integrated design was partially implemented
- Team approach used throughout the design process
- Green design facilitation supported integration of energy and environmental considerations throughout the design stages

Environmental Purchasing

- Products meeting green specifications include bamboo and rubber roll flooring
- Energy-saving, high-efficiency equipment

Commissioning Plan

- Best-practice project commissioning plan includes:
  - Engagement of Commissioning Authority
  - Review of *Design Intent* and *Basis of Design* documentation
  - Inclusion of commissioning requirements in construction documentation
  - Development of Commissioning Plan

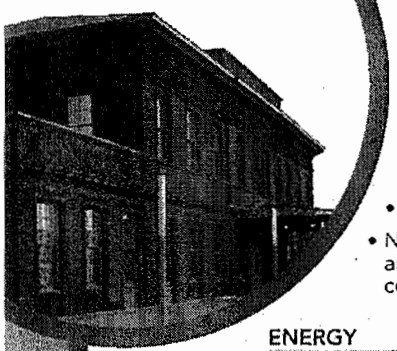
Emergency Response Plan

- Plan to mitigate likelihood of on-site safety and environmental emergencies during preparation and construction
- Emergency Manual for building operation

SITE

Development Area

- Constructed on remediated, previously contaminated land
- Located on land that is neither a wetland nor a wildlife corridor
- Building functions are accommodated while minimizing disturbance to site topography, soils and vegetation



Minimization of Ecological Impact

- Best management practices control site erosion

Enhancement of Site Ecology

- Remediation of brownfield site
- Naturalized landscape using hardy and native trees, shrubs and ground cover, with minimal lawn

ENERGY

Building Energy Performance

- Building is projected to be 20% more energy-efficient than the energy code reference building

Space Optimization

- Floor area optimized to fulfill functional and special requirements while minimizing space to be heated and cooled

Microclimate and Topography

- Site topography and design measures optimized to provide shelter from wind

Integration of Daylighting

- Daylighting optimized through building orientation and window-to-wall size ratios

Building Envelope

- Window glazing with low U value and treatments that enhance interior thermal comfort
- Measures to prevent groundwater and/or rain penetration
- Best air/vapor barrier practices optimize building integrity

Energy Metering

- Building Management System (BMS) tracks energy use by specific area
- Sub-metering of major energy uses

Energy-efficient Systems

- High-efficiency lighting fixtures, lamps, ballasts, lighting controls, HVAC equipment, boilers, chillers, hot water service systems, building automation systems, variable speed drives, motors and elevators
- Other advanced building technologies include radiant floor system, heat exchangers and photovoltaic solar panels for improved energy-efficiency

Renewable Energy Sources

- Photovoltaic solar panels supply portion of the total energy load

Energy-efficient Transportation

- Easily accessible public transportation
- Preferred carpool parking
- Secure bicycle parking and changing facilities

WATER

Water Performance

- Consumption metered and sub-meters provided for high usage operations/occupancies

Water Conserving Features

- Water-saving showerheads (2.5 gallons/minute) and low-flush toilets (1.6 gallons/minute)
- Cooling towers include features to minimize consumption of make-up water
- Water-efficient irrigation system

RESOURCES, BUILDING MATERIALS AND SOLID WASTE

Materials that Minimize Consumption of Resources

- Materials containing recycled content include cast in-place concrete, pre-cast concrete systems, structural steel, self-adhering sheet waterproofing, hot fluid-applied roofing, gypsum board assemblies, acoustic panel ceiling, resilient floor tile and carpet
- Reused ceiling tiles, light fixtures
- Recycled steel for structure, recycled blast furnace slag in concrete foundation and sidewalks, recycled aluminum in curtain wall system
- Solid lumber and timber panel from sources certified as sustainable
- Materials from renewable sources and/or locally manufactured were specified

Reuse of Existing Buildings

- Design integrated all existing façades from original railway station building
- 50% of the existing major structures (other than the shell) are reused

Building Durability, Adaptability and Disassembly

- Building assemblies and materials specified for durability and low maintenance (e.g. brick, glass, aluminum and steel)
- Design promotes building adaptability (i.e. for community functions)
- Design and selection of materials and fastenings allow easy disassembly

Facilities for Recycling and Composting

- 300 ft² of space designated for the storage of recyclable waste

EMISSIONS AND OTHER IMPACTS

Minimization of Air Emissions

- Low-NOx boilers and furnaces (i.e. heat input of 5,220,000 BTU/hour)

Minimization of Ozone-depletion

- Refrigeration system avoids ozone-depleting substances (ODS) and potent industrial greenhouse gases (PIGG)
- Ozone-depleting potential of refrigerant HFC-134a equal to 0
- Air-conditioning system complies with Safety Code for Mechanical Refrigeration, ASHRAE 15 -1994

Control of Surface Run-off and Prevention of Sewer Contamination

- Measures to intercept and/or treat contaminated water to prevent pollutants (including toxic materials, oils and suspended materials) from entering sewers or waterways

Integrated Pest Management

- Measures taken to avoid infestation by pests

Storage and Control of Hazardous Materials

- Secure, ventilated storage areas for hazardous and flammable materials

INDOOR ENVIRONMENT

Effective Ventilation System

- Air intakes and outlets positioned at least 30 ft. apart; inlets upwind of outlets
- Air intakes located more than 60 ft. from major sources of pollution and at least minimum recommended distances from lesser sources of pollution
- Vent openings suitably protected
- Systems and components avoid release of pollution and fibers into ventilation air path
- Sufficient ventilation to obtain acceptable IAQ, in accordance with ANSI/ASHRAE 62.1-2004
- Mechanical systems provide effective air exchange (computer modeled)
- Electronic airflow indoor air quality monitoring
- Capacity for mechanical ventilation system to flush the building with 100% outside air at ambient temperatures above 32°F
- Personal control over ventilation including controls for archives
- Filters have minimum efficiency of 65% arrestance, or 40% atmospheric dust-spot efficiency for air distributed to occupied spaces

Source Control of Indoor Pollutants

- Measures to minimize moisture and prevent the growth of fungus, mold, and bacteria
- Easy access to air-handling units (AHUs) facilitates maintenance and drainage and avoids accumulation of debris
- Humidifiers avoid growth of microorganisms
- Measures to avoid pollution at-source (i.e. no VOC finishes and no smoking within the building)
- Wet cooling towers designed and located to prevent Legionella; tower uses triple-bypass drift eliminators, which limit drift losses to no more than 0.005% of the design GPM flow rate
- Domestic hot water system designed to prevent Legionella
- Interior materials are low-VOC, non-toxic and chemically inert (e.g. rough carpentry, exterior finish carpentry, interior architectural woodwork, wood paneling, flush wood doors, wood flooring, resilient floor tile, carpet and paint)

Daylighting

- Direct ambient daylight to 80% of primary spaces
- Ambient natural lighting provides daylight factor of 0.2 for work places and or living/dining areas requiring moderate daylighting, and 0.5 for well day-lit work areas
- Views to the building exterior or atria from all primary interior spaces
- Solar shading devices enable occupants to control brightness and glare from direct daylighting

Lighting Design

- Lighting levels meet those recommended in *IESNA Lighting Handbook, 2000*
- Measures to ensure that spaces are free of excessive direct or reflected glare
- Local lighting controls related to room occupancy, circulation space, daylighting and number of workstations

Thermal Comfort

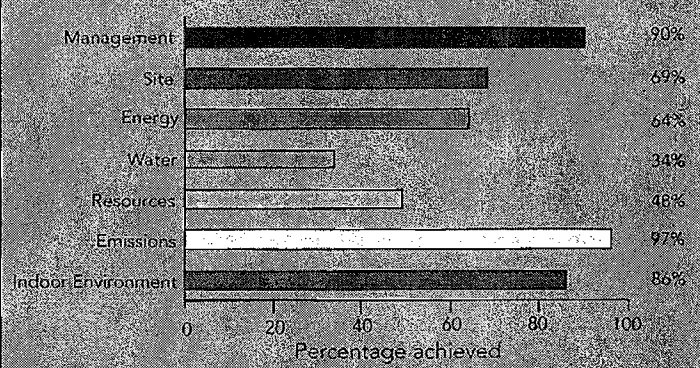
- Design conforms to ASHRAE 55-2004 for thermal comfort

Acoustic Comfort

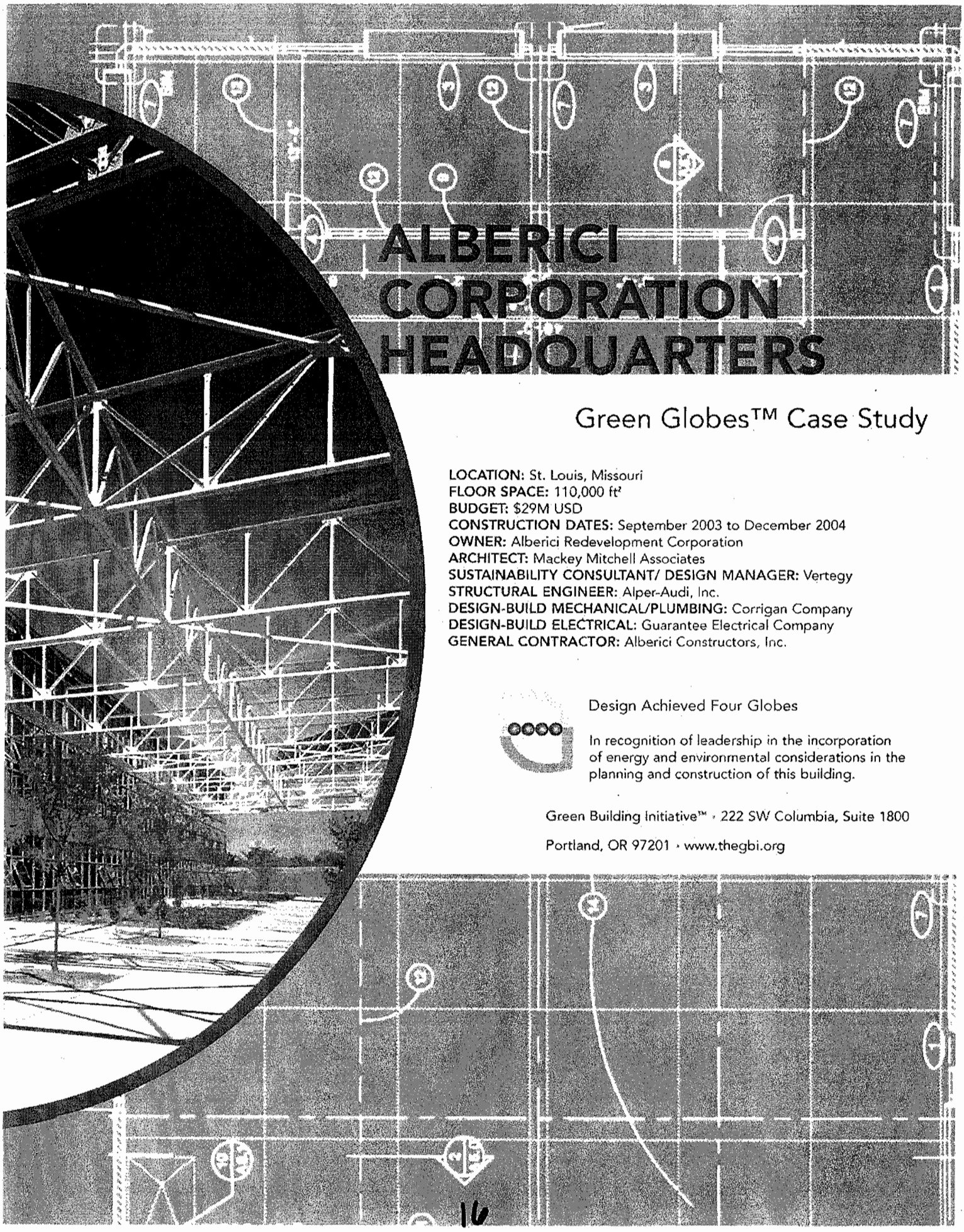
- Building is sited and spaced within the building zone to provide optimum protection from undesirable outside noise, and fall within acceptable noise criteria (NC) ranges
- Noise attenuation of structural systems and measures to insulate primary spaces from impact noise
- Measures to meet speech intelligibility requirements
- Measures to mitigate acoustic problems associated with mechanical equipment noise and vibration, and plumbing

85–100%	4 Globes	Reserved for select building designs which serve as national or world leaders in energy and environmental performance. The project introduces design practices that can be adopted and implemented by others.
70–84%	3 Globes	Demonstrates leadership in energy and environmental design practices and a commitment to continuous improvement and industry leadership.
55–69%	2 Globes	Demonstrates excellent progress in achieving eco-efficiency results through current best practices in energy and environmental design.
35–54%	1 Globe	Demonstrates movement beyond awareness and commitment to sound energy and environmental design practices by demonstrating good progress in reducing environmental impacts.

Green Globes Rating



The William J. Clinton Presidential Center achieved an overall rating of 68%



ALBERICI CORPORATION HEADQUARTERS

Green Globes™ Case Study

LOCATION: St. Louis, Missouri
FLOOR SPACE: 110,000 ft²
BUDGET: $29M USD
CONSTRUCTION DATES: September 2003 to December 2004
OWNER: Alberici Redevelopment Corporation
ARCHITECT: Mackey Mitchell Associates
SUSTAINABILITY CONSULTANT/ DESIGN MANAGER: Vertegy
STRUCTURAL ENGINEER: Alper-Audi, Inc.
DESIGN-BUILD MECHANICAL/PLUMBING: Corrigan Company
DESIGN-BUILD ELECTRICAL: Guarantee Electrical Company
GENERAL CONTRACTOR: Alberici Constructors, Inc.

Design Achieved Four Globes

In recognition of leadership in the incorporation of energy and environmental considerations in the planning and construction of this building.

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PROJECT NOTES

The Alberici Corporation Headquarters is a two-story, 110,000-square-foot Class-A office building in St. Louis, Missouri.

PROJECT MANAGEMENT

Integrated Design Process (IDP)

- Emphasis on IDP during design development and during integrated project delivery
- Green design facilitation supported aggressive goal setting and integration of energy and environmental considerations throughout the design stages

Environmental Purchasing

- Green specifications incorporated (e.g. 100% synthetic Gyp-board, ELMS50 roof membrane, Plyboo, Wheatstalk)
- Environmental purchasing has been integrated, including the procurement of energy-saving, high-efficiency equipment

Commissioning Plan

- Best-practice project commissioning plan includes:
  - Engagement of Commissioning Authority
  - Review of *Design Intent* and *Basis of Design* documentation
  - Development of Commissioning Plan

SITE

Development Area

- Constructed on existing serviced site (former steel works)
- Constructed on remediated, previously contaminated land

Minimization of Ecological Impact

- Best management practices control site erosion
- At least 50% of impervious surfaces shaded to avoid creating a heat island
- Roof is Energy Star compliant; high albedo materials on 100% of the roof surface reflect heat and avoid creating a heat island
- Exterior lighting unobtrusive to preserve nocturnal sky

Enhancement of Watershed Features

- Storm water run-off controlled to prevent damage to the building and vegetation, and to minimize run-off into waterways
- Storm water control plan designed to achieve a 90% decrease in storm water run-off
- Run-off from the roof will be controlled and directed to a pervious area and two high clay content lined ponds, which retain 100% of rain water

Enhancement of Site Ecology

- Site-planning documents specify a native prairie planted with trees, grasses and wildflowers indigenous to the region

ENERGY

Building Energy Performance

- Building projected to be 45% more energy-efficient than reference EPA Energy Star Target Finder building; energy targets are reportedly being met

Space Optimization

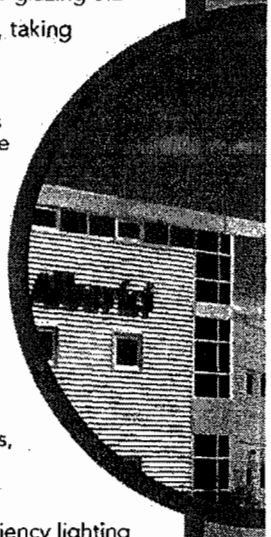
- Floor area optimized to efficiently fulfill functional and spatial requirements while minimizing the amount of space to be heated and cooled (e.g. non-leasable footage under stairs is used for storage; core elements are located in the building center and all elements of like function stacked on top of each other)

Microclimate and Topography

- Building oriented on site to optimize the effect of microclimatic conditions for heating or cooling
- Design maximizes opportunities for natural ventilation

Integration of Daylighting

- Daylighting is optimized through building orientation and window-to-wall size ratios
- Indicated visible transmittance (VT) of window glazing 0.2
- Electrical lighting integrated with daylighting, taking into account daily and seasonal variations



Building Envelope

- Thermal resistance of exterior enclosure meets Building Energy Code levels; thermal resistance of R19 for exterior wall and R30 for the roof
- Window glazing with a low U value and window treatments enhance interior thermal comfort; indicated U value of window glazing 0.31
- Measures to prevent groundwater and/or rain penetration into the building (best air/vapor barrier practices optimize building integrity; air barrier materials meet local and national building code requirements)

Energy Metering

- Sub-metering for major energy uses (e.g. chillers, boilers, VFDs, hot water heaters, lighting)

Energy-efficient Systems

- Energy-efficient equipment includes high-efficiency lighting fixtures, lamps with step ballast, lighting controls/occupancy sensors, HVAC equipment with under-floor system and heat recovery, humidity control and both airside and waterside economizer, boilers (modulating or condensing), chillers, hot water service systems, building automation systems and elevators

Renewable Energy Sources

- Renewable energy sources to supply more than 20% of total load; design includes a solar preheat system for 95% of hot water and a 65kW wind turbine for 18% of the facility's energy needs

Energy-efficient Transportation

- Easily accessible public transportation; carpooling and/or public transport accommodated on-site; preferred parking for car/van pooling and shelter
- Secure bicycle parking and changing facilities

WATER

Water Performance

- Water consumption target of 70% reduction, or less than 0.9 gallons/ft²/year

Water Conserving Features

- Minimal consumption of potable water; total water consumption is metered and sub-meters will be provided for high water-usage operations or occupancies
- Minimal use of water for cooling towers
- Specified landscaping uses plants that are able to withstand extreme local weather conditions and require no irrigation

RESOURCES, BUILDING MATERIALS AND SOLID WASTE

Systems and Materials with Low Environmental Impact

- Specifications process included life cycle assessment of environmental burden and embodied energy of foundations and floor assembly, column and beam or post and beam combinations, walls and roof assembly

Materials that Minimize Consumption of Resources

- Reused building materials and components (e.g. 65KW wind turbine, structural steel beams, sheet pile, concrete pre-cast panels, granite countertops)
- 28% of the building materials used have recycled content
- Materials from renewable sources and/or locally manufactured are specified and have undergone life cycle assessment; 5% of materials are rapidly renewable including Woodstalk, Plyboo, ELMS50 and cork; 57% are locally manufactured, 52% of which are extracted locally
- Solid lumber and timber panel products will originate from certified and sustainable sources; no tropical hardwoods used

Reuse of Existing Building

- At least 50% of the previous existing roof frame is reused

Building Durability, Adaptability and Disassembly

- Building assemblies and materials specified for their durability and low maintenance (e.g. steel, pre-cast concrete, glass, brick, galvanized steel panels)
- Design, selection of materials and fastenings allow for easy disassembly

Reuse and Recycling of Construction/Demolition Waste

- Construction, demolition and renovation waste management plan; 93% of construction waste diverted from landfill; management of all construction waste carried out according to the plan

Facilities for Recycling and Composting

- 300 ft² designated for the storage of recyclable waste

EMISSIONS, EFFLUENTS AND OTHER IMPACTS

Minimization of Air Emissions

- Low-NOx boilers and furnaces (i.e. heat input of 1,200,000 BTU/hour)

Minimization of Ozone-depletion

- Refrigeration system avoids ozone-depleting substances (ODS) and potent industrial greenhouse gases; ozone-depleting potential of refrigerant equal to 0

Control of Surface Run-off and Prevention of Sewer Contamination

- Measures taken to intercept and/or treat contaminated water to prevent pollutants including toxic materials, oils and suspended materials from entering sewers and waterways

Pollution Minimization

- Compliant storage tanks will prevent soil and surface water contamination materials

Storage and Control of Hazardous Materials

- Secure, appropriately ventilated areas for storage of hazardous and flammable materials

INDOOR ENVIRONMENT

Effective Ventilation System

- Air intakes and outlets positioned at least 32 feet apart and inlets will not be downwind of outlets
- Air intakes located more than 60 feet from major sources of pollution and at least the minimum recommended distances from lesser sources
- Sufficient ventilation provided to obtain an acceptable IAQ, in accordance with ANSI/ASHRAE 62.1-2004 using the Ventilation Rate Design Procedure; reported design ventilation rate is 53 cfm/person
- Mechanical systems provide effective air exchange (i.e. compliance to ASHRAE completed ADPI calculations for each major space in accordance to ASHRAE 2001 fundamentals chapter 32)
- Indoor air monitored for CO_2
- Mechanical ventilation system capable of flushing the building with 100% outside air at ambient temperatures above 32°F
- Filters with minimum efficiency of 65% arrestance or 40% atmospheric dust-spot efficiency for air distributed to occupied spaces

Source Control of Indoor Pollutants

- Measures taken to minimize accumulation of moisture and prevent growth of fungus, mold, and bacteria (mold was professionally remediated during construction; moisture is controlled through good envelope and cooling/dehumidification)
- Easy access to the Energy Recovery Ventilators (ERVs) to facilitate their maintenance and drainage to avoid the accumulation of debris
- Humidifiers specified to avoid the growth of microorganisms (i.e. compliance with ASHRAE 55-1992)
- Measures taken to avoid pollution at source (e.g. print rooms, chemical storage areas and restrooms ventilated directly outside the building)
- Wet cooling towers designed and located to avoid the risk of Legionella
- Domestic hot water system designed to prevent the occurrence of Legionella
- Interior materials specified that are low-VOC emitting, nontoxic, and chemically inert (e.g. paints, caulks, adhesives, composite wood and carpets specified to be low or no VOC)

Daylighting

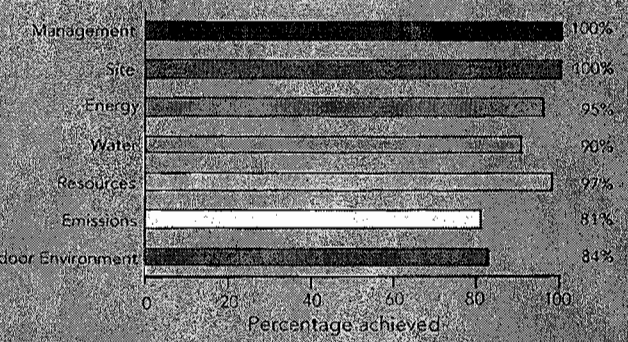
- Direct ambient daylight to 80% of primary spaces
- Ambient natural lighting achieving a daylight factor of 0.2 for work places and or living/dining areas requiring moderate daylighting, and 0.5 for well day-lit work areas
- Views to the building exterior or atria from all primary interior spaces

Lighting Design

- Measures taken to ensure that spaces are free of excessive direct or reflected glare, as defined in IESNA RP-5, 1999, Recommended Practice of Daylighting
- Design integrates local lighting controls related to room occupancy, circulation space, daylighting and the number of workstations in office areas

85–100%	5 globes	Reserved for select building designs which serve as national or world leaders in energy and environmental performance. The project introduces design practices that can be adopted and implemented by others.
70–84%	4 globes	Demonstrates leadership in energy and environmental design practices and a commitment to continuous improvement and industry leadership.
55–69%	3 globes	Demonstrates excellent progress in achieving eco-efficiency results through current best practices in energy and environmental design.
35–54%	2 globes	Demonstrates movement beyond awareness and commitment to sound energy and environmental design practices by demonstrating good progress in reducing environmental impacts.

Green Globes Rating – Alberici Corporation Headquarters



Alberici Corporation Headquarters achieved an overall rating of 93%.

Green Globes History

History of Green Building Initiative™ and Green Globes™

The Green Building Initiative™ (GBI) is a non-profit organization governed by a multi-stakeholder board. Its 15 directors represent a balance of industry, users (i.e. architects, engineers, builders) and interested parties (i.e. NGOs), each of whom has a single vote. Ultimately, the GBI aims to expand its board to 30 participants.

The GBI was originally conceived as a means to promote credible and practical green building tools to the mainstream commercial and residential construction industries.

In 2004, while developing a strategic partnership with the National Association of Home Builders (NAHB) to promote its Model Green Home Building Guidelines, an opportunity emerged to bring a revolutionary tool for commercial construction—the Green Globes™ environmental assessment and rating system—from Canada to the United States.

The following year the GBI was formally recognized by as an accredited national standards developer by the American National Standards Institute (ANSI). This recognition made the GBI the first green building organization permitted to develop, maintain and withdraw American national standards. Shortly thereafter the recognition from ANSI, the GBI submitted an application to establish Green Globes as an American National Standard (ANS).

Both the GBI and Green Globes have benefited from the early support of a core group of industries, users and like-minded organizations that are committed to advancing the cause of green building by promoting a variety of credible tools for mainstream use. Industry organizations like the Wood Promotion Network and companies such as Dow Chemical, as well as representatives from the financial services sector, retailers, wholesalers, appliance manufacturers and building material providers such as US GreenFiber have all stepped forward to offer their support. To build on this momentum, the GBI is actively working to diversify its leadership and financial base with similarly committed companies and organizations.

In terms of residential construction, the GBI is working with Home Builder Associations in more than 15 major markets to create and populate local programs based on the NAHB Model Green Home Building Guidelines. The GBI provides various types of support, including educational seminars, verification development and training, and program marketing assistance.

For commercial construction, the GBI promotes the Green Globes environmental assessment and rating system—a practical and affordable tool that helps to guide the

integration of green principles into a building's design. The Green Globes system represents more than nine years of research and refinement by a range of prominent international organizations and experts. Based on the British Research Establishment's Environmental Assessment Method (BREEAM), it was brought to Canada in 1996 in cooperation with ECD Energy and Environment. Pioneers of this project included Jiri Skopek, John Doggart and Roger Baldwin, who were the principal authors of the BREEAM Canada document.

In 1996, the Canadian Standards Association published BREEAM Canada for Existing Buildings. More than 35 individuals participated in its development, including representatives from organizations such as Bell Canada, Carrier, Canadian Construction Research Board, Canadian Standards Association, ECE Group, Environment Canada, Environmental Planning Institute of Canada, Halozone, Inc., International Council for Local Environmental Initiatives, Natural Resources Canada, National Research Council, Ontario Hydro, Ontario Realty Corporation, Tescor Energy Services, Inc. and the University of Toronto.

In 1999, ECD Energy and Environment worked with TerraChoice, the agency that administers the Government of Canada's Environmental Choice program, to develop a more streamlined, question-based tool, which was introduced as the BREEAM Green Leaf eco-rating program. This program led to the development of Green Leaf for Municipal Buildings with the Federation of Canadian Municipalities later that year.

In 2000, BREEAM Green Leaf took another leap forward in its evolution, becoming an online assessment and rating tool under the name Green Globes for Existing Buildings. Also that year, BREEAM Green Leaf for the Design of New Buildings was developed for the Department of National Defense and Public Works and Government Services Canada.

In 2002, Green Globes for Existing Buildings was introduced online in the United Kingdom as the Global Environmental Method (GEM). Work also began to adapt BREEAM Green Leaf for the Design of New Buildings into the online Green Globes for New Buildings. Participants in this process included representatives from Arizona State University, Besto Group, Building Owners and Manufacturers Association of Canada, Canadian Construction Association, Canadian Standards Association, Department of National Defense, DST Group, Elia Sterling Associates, Energy Profiles, GWL Realty, MCMP Architects, Natural Resources Canada, Public Works and, Government Services Canada, Stewart Energy, TerraChoice and The Athena Institute.

In 2004, the Green Building Initiative acquired the rights to distribute Green Globes USA in the United States. Also that year, Green Globes for Existing Buildings was adopted by the Building Owners and Manufacturers Association of Canada as a national program under the name BOMA Go Green Comprehensive.

The GBI plans to continue refining the Green Globes system to ensure that it reflects ongoing advances in building science and technology.

CSA Verifier Release

CSA AMERICA INC

GREEN BUILDING INITIATIVE

NEWS RELEASE

FOR IMMEDIATE RELEASE

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CSA AMERICA TO DEVELOP PERSONNEL CERTIFICATION PROGRAM ON BEHALF OF GREEN BUILDING INITIATIVE

Cleveland, OH –March 6, 2007 – CSA America, Inc., a leading developer of standards and codes, today announced a new agreement with the Green Building Initiative™ (GBI) for the development of the Green Globes™ independently accredited Personnel Certification program. CSA America will develop the Personnel Certification program on behalf of GBI for assessors using the Green Globes environmental assessment and rating system to verify achievements in design and operation of green buildings. It is the industry's first independently administered certification program for third-party verifiers of green buildings.

"CSA America is committed to addressing climate change issues and welcomes the opportunity to work with the Green Building Initiative on this project," says Spencer Grieco, Vice President, Standards, CSA America. "Through this agreement, CSA America will play a critical role in advancing building efficiency by creating an industry-wide, independently validated certification program that provides assurances of the competence of anyone evaluating building designs using the Green Globes system."

Green Globes is North America's first web-based and interactive building rating system and design tool; the tool includes an assessment protocol, rating system and guide for integrating environmentally friendly design into commercial buildings. Once a project is complete, the building can be recognized as a Green Globes building only following third-party verification, which includes an on-site inspection and auditing of points attributed through the rating process.

According to Vicki Worden, GBI's head of commercial programs, "This program is important for GBI as we prepare for the release of Green Globes as an American National Standard. CSA America will help us fulfill our commitment to the public to follow the most credible and codified procedures for our program development activities."

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The Green Globes Assessor Certification Program will be based on ISO 17024 *General Requirements for Bodies Operating Certification Systems of Persons*. Personnel certification is the assessment and formal recognition, through certification, of an individual's competence against objectively identified criteria within a specific subject area.

The goal of CSA America's certification program is to improve public confidence through the development and application of specific worker competency criteria that address the needs of workers, industry, regulators, and the general public. Unlike qualification based programs that consider an individual's education and general qualifications, CSA America's program examines an individual's measurable competency. The examination is expected to be available in mid-2007.

For more information on Personnel Certification Services, contact CSA at (216) 524-4990 or personnel-certification@csa-america.org.

About CSA America:

CSA America develops standards for gas equipment, fuel cells and related energy sectors in the U.S. market, provides personnel certification services, and participates in other National and International standards activities. CSA America, Inc. is accredited by American National Standards Institute (ANSI) and is a part of CSA Group, which also consists of the Canadian Standards Association, a developer of standards and codes, CSA International for product testing and certification, OnSpeX for consumer product evaluation services, and QMI for management systems registration. For more information, visit www.csa-america.org

About The Green Building Initiative:
The mission of the Green Building Initiative is to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches. A not-for-profit education initiative, the GBI is supported by a broad cross section of organizations and individuals with an interest in residential and commercial construction. For more information on the Green Building Initiative, please visit www.thegbi.org.

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Green Globes Continual Improvement of Existing Buildings Fact Sheet

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Fact Sheet
Green Globes™ for Continual Improvement of Existing Buildings
PILOT PROGRAM TO BE LAUNCHED JANUARY 2007

To complement the Green Globes module for New Construction, the Green Building Initiative™ will soon launch Green Globes for Continual Improvement of Existing Buildings—an online system designed to give building owners and facility managers a practical and cost-effective way to assess and improve the performance of commercial and institutional buildings.

Known as Green Globes for Continual Improvement, this unique green asset management tool allows users to:

- Assess and benchmark building performance,
- Develop comprehensive action plans for improvement,
- Evaluate and compare multiple buildings within a portfolio
- Foster increased environmental consciousness while training operational staff to reduce costs, and
- Improve tenant relations by demonstrating a commitment both to the environment and occupant health and comfort.

The Assessment Process
Flexible and user-friendly, the system features an online questionnaire that can be completed in two to three hours, providing users have information such as energy and other utility bills at hand. There are approximately 150 questions, most of which require a *yes* or *no* answer.

Questions are divided into six areas of assessment, each focusing on one aspect of the building's operation or management and each weighted based on its environmental impact:

- Energy
- Water
- Resources
- Emissions, Effluents and Other Impacts
- Indoor Environment
- Environmental Management

Once the questionnaire is complete, the system generates a comprehensive report. It identifies strengths and weaknesses, suggests opportunities for improvement, and serves as a platform for communication between owners, facility managers and operational staff.

Green Globes Rating
Green Globes uses criteria established following several years of extensive consultation with industry experts. This criteria is also based on the experience of BOMA Canada's Go Green Plus program, which is the trade name used by that organization for the Green Globes existing buildings module, and is the basis for BOMA Canada's national environmental program.

Buildings that achieve a score of 70% or more out of 1,000 possible points are eligible to receive a Green Globes pass/fail rating. Once the rating is verified, buildings receive publicity and a plaque from the Green Building Initiative, and are permitted to publicize their achievement. The percentage scores - overall and for each section - are also useful as a tool for internal benchmarking.

An Established Green Management Tool
Like Green Globes for New Construction, the Continual Improvement module is already widely used in Canada—both under the Green Globes name and as the basis for BOMA Canada's Go Green Plus program. Go Green Plus was recently chosen by the Department of Public Works and Government Services for use with an estimated 300 buildings within its existing portfolio.

With the exception of adding the EPA's Energy Star program for benchmarking, the adaptation for the U.S. market included non-substantive changes only, such as units of measure and the exchange of U.S. for Canadian references. However, as part of the process to establish Green Globes as an official standard recognized by the American National Standards Institute (ANSI), both modules are undergoing a thorough technical review.

Linking Sustainable Design and Operational Performance
For new commercial projects, the GBI recommends that Green Globes for New Construction be used in concert with Green Globes for Continual Improvement to ensure that the building team stays focused on improving operational performance—and to avoid the all-too-common gaps between predicted design and actual performance outcomes.

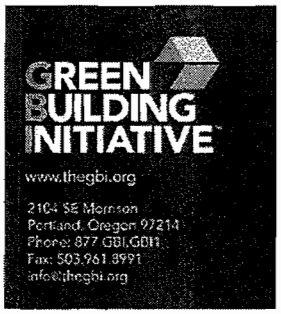
Using energy as an example, there are a tremendous number of variables that have an impact on performance, including building systems, operations and occupant habits. As a result, it isn't unusual for consumption to be substantially higher than predicted values.

With Green Globes for Continual Improvement, users can assess ongoing building performance in a seamless continuum, making it possible to establish a baseline, identify problems when and where they occur, and take corrective action.

Pilot Program
To view a beta version of the Continual Improvement module, please visit http://www.greenglobes.com/existing/homeus.asp. Complete the registration form and enter the complimentary code: **performance1**.

The GBI is looking for buildings to participate in our U.S. Pilot Program starting in January 2007. If you are interested in taking your building through the module, please e-mail cipilot@thegbi.org or visit www.thegbi.org for more information.

Dual Certified Buildings by Green Globes and LEED



Dual Certified Buildings by Green Globes and LEED

Building	Green Globes Score	LEED Score	Building Contact
Alberici Corporate Headquarters	4 Globes	Platinum 60 points	Thomas A. Taylor (314) 733-2666 TomT@ALBERICI.com
William J. Clinton Presidential Center	2 Globes	Silver 34 points	Jonathan Semans (501) 920-1279 jsemans@semanspartnership.com
Blakeley Hall	2 Globes	Silver Points n/a	Kristen Scott (206) 344-5700 kscott@weberthompson.com
Pfizer Inc. Clinical Research Unit	3 Globes	Silver Points n/a	Gregory J. Bergmiller (860) 659-1010 ext. 3363 bergmiller@slamcoll.com
Wisconsin Electrical Employees Benefit Fund Office	2 Globes	LEED Registered	Eric Truelove (608) 833-2321 erict@renschler.com
RenewAire, LLC	2 Globes	LEED Registered	Eric Truelove (608) 833-2321 erict@renschler.com

GREEN GLOBES

GREEN BUILDING INITIATIVE
Framing the Future