April 19, 2009

Oversight of the GSA and Energy Efficiency in Public Buildings

Green Building Initiative Testimony to the

Senate Committee on Environment and Public Works

Chairman Boxer, Ranking Member Inhofe, and Members of the Committee, thank you for the opportunity to honor Earth Day by participating in this hearing on behalf of the Green Building Initiative, or GBI, and the Green Globes® rating system. I am a founding member of the GBI board and chair of its energy committee. My background is included in the written submission, but I am a specialist in energy issues, and served on the ASHRAE committee responsible for developing the 90.1 National Energy Standard. As an active member of the sustainability community, I chose to support development of Green Globes in the US because I believe strongly that the marketplace—including both the public and private sectors—needs multiple tools and approaches to achieve its high performance goals.

GBI commends the committee for creating this opportunity to testify about GSA and energy efficiency issues—and we are proud to be on this panel next to some of the most accomplished leaders in the world of green building and sustainability. GSA has certainly been a leader in applying green building practices and has made considerable progress. There are many lessons to be gained from its experience.

We also understand that the committee is interested in ensuring that dollars spent on energy efficiency, through the stimulus package and in general, result in measured savings. To that end, we'd like to address two primary topics.

1. First, one of our greatest challenges is that many buildings designed to be energy efficient fall short once operational. GSA has many successes to its credit but is not immune to this fact. A key to solving this problem will be to shift the mindset of people who design, construct and operate buildings so that form follows function and performance goals—which should include occupant comfort as well as energy and water efficiency—become fundamental considerations from initial concept through design, construction, operations, and renovation.

2. The second issue is measurement—and specifically, the fact that measuring buildings before and after they undergo renovation must be a priority. To that end, the GBI's Green Globes system, which is still fairly new in the US, is a good example of how practical and affordable tools can play an important role.

Regarding the first issue of performance shortfalls, the answer is better information, tools and education.

- Whether planning for design or major renovations, decisions should be based on the best performance data available. This is an area where we as an industry fall short. We rely too heavily on benchmarking to codes.

- For instance, GSA has—as I understand it—an arsenal of data available on the energy performance of its standard building types, and has conducted baseline research on the occupant comfort in many of its buildings.

Instead of designing to perform "better than code", we hope that GSA will begin benchmarking using its historical performance data.

- It's worthwhile to note that innovative states, such as California, are creating new building performance databanks to facilitate more accurate predictions. Because of the importance of having accurate historical performance data, existing national databanks such as the Department of Energy's Commercial Buildings Energy Consumption Survey (or CBECS) database should receive more of our investment dollars.

- With regard to education and training, portfolio managers need tools to create baselines, interpret the results, and prioritize improvements. For many building managers, these types of evaluations represent new ground. Tools such as Green Globes could be used to evaluate buildings that receive stimulus money.

Having laid out some of the challenges that GSA and other portfolio managers face, I'd like to say that NGOs—some of whom are on this panel—and the private sector are working to address many of these issues. If Congress and federal agencies support renewed investment in data collection as well as healthy competition in the market, we are confident that the data available to us will improve, as will the standards, rating systems, tools, education, and even codes themselves. Unfortunately, some agencies still write policies that focus on LEED only, which tends to stifle the benefits of competition—of which there are many.

While Green Globes is widely used in Canada on both public and private buildings, it was at first quite novel here. It takes a slightly different approach in that more than a third of its points are weighted in energy and buildings must be at least 25% more efficient than average before earning any points for energy consumption. Green Globes is also integrated with ENERGY STAR. This was a fundamental decision made by GBI's technical committee to benchmark against the best performance data available by climate, building type and operational characteristics—and we believe it's key to ensuring that buildings perform as predicted.

GBI is also the first organization to take a commercial building rating system through a third-party codified ANSI consensus process—and is on track to release the first American National Standard for commercial green buildings later this year. This work has resulted in many innovations in the areas of carbon metrics and cradle-to-grave evaluation of building assemblies and carbon emissions. GBI also uses highly qualified and credentialed individuals to conduct third-party assessments and is the first and only organization to require on-site review of commercial buildings prior to awarding a Green Globes certification.

Because of its affordability and ease of use, Green Globes is being used to evaluate a growing number of public and private sector buildings.

- Federal agencies such as DHHS, Interior, Veterans Affairs and at the State Department are using Green Globes to create baselines and improve performance. Two GSA regional offices are also using Green Globes on a number of existing buildings within their portfolios. One is an EPA Regional Headquarters office in Chicago that we understand the GSA intends to dual certify using Green Globes and LEED.

- Higher education institutions like Arizona State University, Drexel University, and the University of Arkansas are also using Green Globes, as are state and local governments.

- In the private sector, a growing list of corporations and notable buildings—such as the Empire State Building—are choosing Green Globes because of their need for tools that are both credible and cost effective.

In conclusion:

- GBI applauds GSA's leadership in applying green building technologies and practices. We hope that an important part of the agency's plan will be to measure the before and after performance of buildings that receive stimulus money and that projections will be based on historical performance data.

- We encourage Congress to examine public policies to ensure that new laws encourage benchmarking against existing data and to increase investment in data collection efforts like DOE's CBECS database.

- Lastly, we ask that GSA and other agencies encourage competition in the marketplace by using and supporting multiple rating systems and private sector solutions.

Thank you for the opportunity to be here today.

Green Building Initiative Background and Relevant Information

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.

Harvey Bryan is a professor in the School of Architecture & Landscape Architecture and the School of Sustainability at Arizona State University, and serves on the GBI Board of Directors. His bio appears at the end of this submission. The GBI Board is an independent, multi-stakeholder group 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 additional board members, please visit the board page of the GBI Web site.

In terms of funding, GBI has benefited from the support of a core group of industries that are committed to advancing the green building movement by creating a variety of credible options for design and building professionals. Since its inception, GBI has also worked tirelessly to diversify its financial base through membership, training and other initiatives. A complete list of funders can be found on the members and supporters page of the GBI Web site.

Having long recognized the power of collaboration, GBI has sought to foster relationships with a variety of organizations related to the built environment with the goal of helping to accelerate the acceptance of sustainable design and construction in the marketplace. To this end, GBI has a formal partnership with the US Environmental Protection Agency's ENERGY STAR® program, as well as Memorandums of Understanding with the following organizations:

- American Institute of Architects (AIA)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Associated General Contractors of America (AGC)
- Building Owners and Managers Association (BOMA)
- National Association of Home Builders (NAHB)

GBI has also established collaborative relationships with, among others:

- Alliance to Save Energy (ASE)
- Architecture 2030
- Sustainable Buildings Industry Council (SBIC)

GBI Mission

The GBI is committed to accelerating the adoption of green building practices by offering credible and practical tools that make green design, management and assessment more accessible to a wider population of builders and designers.

Residential Buildings – For residential construction, GBI has a unique strategic partnership with the NAHB. Since the inception of the NAHB Model Green Home Building Guidelines in January 2005, GBI has worked to promote them with

Home Builder Associations (HBAs) across the country and, where desired, to help HBAs use them as the basis for their own local programs. Among our services, GBI provides technical assistance, promotional and marketing support, hosts educational seminars and conducts market research.

With the release of the National Green Building Standard for residential construction—which the NAHB developed in cooperation with the International Code Council through a formal process overseen by the American National Standards Institute (ANSI)—the GBI role has evolved into the promotion of both the standard and its related green building program, NAHB Green.

To date, GBI has secured partnerships with 52 HBAs across the US, enabling us to directly educate more than 60,000 home builders with regard to green building and related offerings of the NAHB.

Commercial Buildings – For the non-residential market, GBI owns the rights to promote and distribute Green Globes®—a highly innovative 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 (Green Globes-NC) and the Continual Improvement of Existing Buildings (Green Globes-CIEB) and facilitates recognition of completed projects through third-party assessment.

Green Globes 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 energy-efficient, healthier and environmentally sensitive buildings are embedded in the tool, enabling it to provide relevant information as required.

Innovation and Competition

When GBI was established in late 2004, there were no green building rating systems with the specific objective of supporting mainstream design and building professionals. This is at the core of both NAHB Green and the Green Globes system and is fundamental to encouraging energy efficiency and other green building practices on the broad scale that is clearly necessary.

Of primary importance, having more than one rating system supports the diversity of buildings, design and building professionals, and budgets. It also creates an atmosphere of healthy competition, which does for green building what it has done in countless other areas—drives improvements, lowers costs and benefits the ultimate consumer, which in this case is our shared environment.

In the last four years, for example, GBI:

- Became the first green building organization to be accredited as a Standards Developing Organization (SDO) by the American National Standards Institute (ANSI),
- Embarked on a process to establish Green Globes as the first ANSI standard for commercial green building, which will be completed this year,
- Introduced Green Globes-CIEB to strengthen the link between sustainable design objectives and actual building performance,

- Developed the first tool for integrating life cycle assessment (LCA)—widely 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 its LCA tool—the ATHENA® *EcoCalculator for Assemblies*—which is available free of charge from the ATHENA Institute (www.athenasmi.ca).

As evidenced by these highlights, GBI's offerings have evolved as new opportunities have arisen to help mainstream practitioners accelerate their adoption of green building practices. Our goal is for green building to become the norm and, while GBI has arguably become a leading voice in the movement, we are committed to remaining nimble and continuing our role as an agent of positive change.

Green Globes – History and Credentials

Originally developed in Canada, the Green Globes environmental assessment and rating system represents more than a dozen 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 Environmental Assessment Method (BREEAM), which has been used to certify close to 100,000 buildings in the UK and 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 BOMA Canada 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, GBI acquired the rights to distribute Green Globes for New Construction in the United States. In adapting the system, the only changes made were those necessary to make the system appropriate for the US market (e.g., converting units of measurement and integration with the ENERGY STAR program).

Since then, GBI has committed itself 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, GBI established a technical committee and subcommittees featuring more than 75 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 on the GBI Web site.

As part of the ANSI process, GBI relinquished control of the Green Globes tool to the technical committee, or consensus body, which is determining the final standard. This is the first time an organization has committed its commercial building rating system to further development through ANSI's third-party codified, consensus-based committee process, which represents the ideals of balance, transparency and public input. As of this writing, the proposed standard has undergone two public comment periods and, once finalized, is expected to include a number of improvements.

For example:

- In the energy section, the proposed standard uses carbon dioxide (CO_2) as the basis for calculating the performance path instead of the previous kBtus per square foot per year of energy consumed, which will require the calculation of CO_2 equivalent. This is particularly important in the context of climate change and the need to consider buildings in terms of their total carbon footprint.

- The proposed standard is the first green building rating system to fully integrate 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. 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 embodied energy and 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 is too complex or time consuming for mainstream practitioners. To remedy this, GBI commissioned a tool that provides instant LCA results for hundreds of building assemblies, making it more accessible than ever before.

  Although developed for integration into Green Globes, GBI recognized the tool's importance to the broader sustainable design community and supported the development of a generic version, the ATHENA® *EcoCalculator for Assemblies*, which is available free of charge from the Athena Web site (www.athenasmi.ca). GBI encourages the use of this tool among other green building organizations and universities, and at all levels of government.

- The proposed standard incorporates a calculator that allows users to project water consumption of new buildings based on their designs. As with other elements of building sustainability, water use has a significant impact on energy consumption.

Green Globes and Energy Efficiency

The Green Globes system is unique in a number of ways that directly impact energy efficiency.

- Green Globes relies on information from the US EPA's ENERGY STAR program and, as such, uses data generated through the Department of Energy's Commercial Buildings Energy Consumption Survey (or CBECS). CBECS provides data on actual building performance by building type, which is the first step in determining how to achieve a building that performs significantly better than average.

- More than a third of Green Globes' point system is weighted to energy efficiency. To receive points under energy performance, a building must be compared to an average building using the ENERGY STAR system. Only those buildings projected to perform in the top 25% of buildings nationwide are eligible for points in this category.

- The two modules of Green Globes seamlessly connect new building design to existing building performance. Certification with Green Globes-NC is just the first step to achieving a truly green structure. Green Globes-CIEB has an important role to play in incentivizing the ongoing measurement and monitoring of building performance—as re-certification every three years is necessary to ensure that a building is in fact being managed in a manner that maintains the integrity of its initial assessment.

- As indicated above, changes to Green Globes made as part of the ANSI process include a shift in the way it calculates energy efficiency from kBtus per square foot to carbon dioxide equivalent and the integration of a tool that provides LCA results for hundreds of common building assemblies. Both are important in the context of climate change for determining and improving a building's energy efficiency as well as its overall carbon footprint.

- Because of its low cost, Green Globes is appealing to budget-sensitive projects such as those that utilize public funds or those that may not otherwise be considered in a green building context.

Using Green Globes for New Construction

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. The report generated includes an educational component, which emphasizes sustainability attributes of the building and provides detailed suggestions for improvements that should reduce the building's overall environmental impact. This is supported by 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 to help users achieve a higher performance design and thus higher Green Globes score.

In Green Globes-NC, 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 (ecological integrity, biodiversity, air and water quality, microclimate, habitat, and fauna and flora), 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-NC 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 US Department of Energy'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, daylighting, 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 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 assessed by a qualified third party.

The Green Globes third-party assessment 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 assessed against the documentation generated throughout the design process and, once complete, the design team receives a Certificate of Achievement. However, a final rating cannot be achieved until after Stage II, which occurs post-construction and includes an on-site inspection by a qualified assessor. This stage can be initiated as soon as construction is complete.

The GBI currently oversees a network of Green Globes-trained assessors comprised primarily of licensed architects and engineers with significant experience in building sciences and sustainability issues. However, to accommodate increasing demand and further strengthen our third-party assessment program, GBI is working in cooperation 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 assessors of green buildings.

Green Globes for Continual Improvement of Existing Buildings

Considering that the United States is home to more than 100 million buildings, the need to improve the performance of existing structures is a necessary prerequisite for widespread energy efficiency. The missing element—until last year when GBI introduced Green Globes-CIEB—was a practical and affordable way to measure and monitor performance on an ongoing basis.

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 physical and human elements such as material use and indoor environment.

As in Green Globes-NC, 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 ENERGY STAR Portfolio Manager to determine a consumption target for each building type and, where appropriate, buildings must meet a minimum performance target of 75% based on the comparable ENERGY STAR building.

US Market Acceptance

To date, 47 buildings have successfully achieved Green Globes third-party certifications across the United States, and 41 buildings are at some stage in the certification process. Another 152 buildings are registered with Green Globes-NC and 265 buildings are registered with Green Globes-CIEB.

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

- Eighteen states have included Green Globes in green building legislation, regulation or executive order, including: Arkansas, Connecticut, Florida, Hawaii, Illinois, Indiana, Kentucky, Minnesota, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia and Wisconsin.

- Green Globes is included in insurance packages offered for green buildings by Aon Corporation, Fireman's Fund Insurance Company and Liberty Mutual.

- 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) are not only using the Green Globes tools but have also included Green Globes in their formal sustainability policies. The Department of Veterans Affairs, State Department and two GSA regional offices are also actively using Green Globes.

- To date, thirty-five federal government buildings have been registered to use Green Globes and are at some stage in the assessment process. This includes 10 Green Globes-CIEB registrations from the US Government Services Administration (GSA) Region 9 (San Francisco), three Green Globes-CIEB registrations and one Green Globes-NC registration from GSA Region 5 (Chicago), 21 Green Globes-CIEB registrations from the US Department of Veterans Affairs and one Green Globes-CIEB registration from the US Department of State.

- Since the launch of Green Globes-CIEB, some of the largest corporations and real estate companies in the country have chosen to use it for their existing building portfolios, including the USAA Real Estate Company, which plans to use Green Globes-CIEB to assess up to 20 buildings; Tishman Speyer-Chicago, which is gearing up to assess 12 buildings; Capital One, which recently certified nine buildings at its Richmond, Va. headquarters and has begun the process of certifying its Washington DC-area facility in McLean, Va.; and the Carol Woods Retirement Community, which used the tool to assess and improve the environmental performance of 10 buildings at its Chapel Hill, NC facility.

The Potential of Green Building Rating Systems to Accelerate Building Efficiency

In addition to the specifics associated with Green Globes, green building rating systems in general help to accelerate progress toward energy efficiency in three important ways:

1. Rating systems define achievable goals beyond mandatory codes.

- A building must be approximately 25% more efficient than an average building built to the ASHRAE 90.1-2004 standard (or code) in order to achieve any points in the Green Globes section on energy performance.

2. Rating systems provide the means to measure progress against these goals.

   - For example, the Green Globes system rates on a 1000-point scale, with points awarded based on the building's performance against a broad range of environmental and energy metrics. Using the system helps building owners set priorities during the design process, measure outcomes once the building is operational, and plan for improvements.

3. Rating systems create a market dynamic that rewards those who go beyond mandatory codes. In the private sector, this includes incentives such as green insurance products and mortgages and there is a growing body of information supporting the marketing benefits of green building certification. However, this is equally important in the public sector where buildings that perform well serve as examples for others—both at a technical level, for those who manage the performance of buildings, and as a more general encouragement to the community to follow suit.

Conclusion

It is the GBI's view that substantially improving the energy efficiency of buildings one of the most important things Congress can do to address climate change and other impacts associated with energy consumption. We commend the Senate Committee for Environment and Public Works for seeking to use its oversight authority to achieve this goal, and thank you for the opportunity to contribute our testimony.

Speaker Biography

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A recognized specialist in building technology, Dr. Bryan has authored more than 100 papers and articles on the relationship between technology and the design of high-performance buildings. He has served on the design faculties of the Massachusetts Institute of Technology (MIT), Harvard, and the University of California, Los Angeles (UCLA), where his research received support from numerous public and private sponsors. Dr. Bryan was a member of teams that received three Progressive Architecture Awards, co-chairman of the 1986 International Daylighting Conference, will be serving as chairman for the Solar 2010 Conference and was associate editor of the international journals, "Building and the Environment" and "Solar Energy."

Dr. Bryan is currently active in several professional and technical societies. He has served on the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) committee responsible for developing the 90.1 National Energy Standard and is presently serving on the ASHRAE committee responsible for developing "Proposed Standard 189.1P, Standard for the Design of High-Performance Green Buildings." He has a B.Arch. from Arizona State University, a M.Arch., M.S. and Ph.D. from the University of California, Berkeley, is a fellow of the American Institute of Architects, a fellow of the American Solar Energy Society as well as a Fulbright Fellow.

Dr. Bryan also serves on the GBI/ANSI technical committee responsible for developing Green Globes and establishing it as the first American National Standard for commercial green buildings.