"Federation Corner" column
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**United Kingdom really gets global warming**
by Wayne Goldstein

The United Kingdom (UK) is far ahead of the U.S. in acting to reduce the impact of building construction and operation on global warming. The UK's Building Research Establishment Environmental Assessment Method (BREEAM) was created in 1990, with the first two versions covering offices and homes. Ecohomes, the version of BREEAM for residential construction, began in 2000. In April 2007 the Code for Sustainable Homes replaced Ecohomes for the assessment of new housing in the UK. The Code is an environmental assessment method for new homes based upon BRE's Ecohomes and contains mandatory performance levels in 6 key areas... Why is energy important? The CO2 emitted from the operation of buildings in the UK accounts for over 50% of the total UK CO2 emissions. If you include CO2 from manufacturing, transportation of construction materials and transport of people (usually to and from buildings) this figure increases to 75% of the total UK CO2 emissions.

While the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System has had a major impact on how new office and multifamily buildings have been designed and constructed, this has not included the level of focus on carbon dioxide that is a major part of BREEAM. Nor has LEED yet been applied to single-family homes. The British government now requires that all new homes will have to have zero emissions of carbon dioxide by 2016, while the U.S., through the LEED program, is just beginning to discuss voluntary standards for greater energy efficiency for new homes.

To give an example of how focused British thinking is on this complex subject, consider these excerpts from an article published in November 2007.

"How much should we worry about the energy needed to make materials? And how about the energy needed to organise those materials into a building? The temptation is to ignore these questions. Haven't we got enough to worry about with Part L, energy labelling, the Code for Sustainable Homes, the upcoming code for everything else, and all the other regulations dreamed and undreamed? But the thing is, the more successful these regulations are at cutting the energy needed to run buildings, the more important the embodied energy question becomes. Embodied energy makes up a much greater percentage of a low-energy building's total lifetime carbon footprint than one that uses lots of energy... The figures for embodied energy as a percentage of total lifetime carbon emissions certainly look startling. Design and construction firm Simons Group has worked out that the embodied energy in a distribution centre is much greater than the energy it will use over its 25-year life. Indeed, the operational figure is just 35% of its total carbon footprint.

"These figures have prompted calls for legislation to tackle the issue, as embodied carbon is going to become ever more significant. The UK Green Building Council (UKGBC) is working with the communities department on a code for sustainable non-dwellings. 'We have agreed we should stick as closely as possible to the parameters used for housing,' says Paul King, UKGBC director, 'but this does raise the point that we should be looking at this issue more.' King adds that the UKGBC is thinking about setting up a task force to look into embodied energy.

"How easy is it to cut embodied energy? Some designers are already attempting to reduce buildings' embodied energy because they see it as important. Some clients such as Development Securities and ProLogis are also beginning to insist on carbon footprint data for their projects. How do designers rise to this challenge?

"One Kingdom St, Paddington Central, west London- [A 10-story, 225,000 square foot office building] Sustainability consultant Dcarbon8 monitored all the materials used to construct the building. Embodied energy was calculated using generic benchmarking data from Bath University. The amount of fuel and electricity used by the contractor was also factored in, as were waste levels and the estimated amount of energy that would be needed to demolish the building at the end of its life. The results are shown in this diagram... The final score- * Embodied carbon in material 85% * Carbon created by construction 13% * Estimated carbon produced by demolition 2% * The total embodied energy represents about 20% of its total lifetime carbon footprint. If it were a state-of-the-art low-energy building it would be more like 40%."

In fact, there were a number of important actions taken in England in 2007 to continue to further implement strategies to control carbon and limit global warming. Articles from the last few months of the year show part of this remarkable process, including the positive response of English industry to new and future regulations related to controlling carbon in the building process:

September 2007 - "Material groups Aggregate Industries and Marshals are to work out the embodied carbon in their products as part of a new carbon foot printing standard. The Carbon Trust, Defra and BSI British standards have collaborated on the benchmark, which is based on a method for measuring the embodied greenhouse gas emissions from products and services across their lifecycle and will be applicable to a wide range of sectors and product categories. They are also looking at the most effective way of communicating this to consumers.

"The materials groups will focus on hard landscaping products initially. This will include flagstones, block-paving, walling, road masonry and paving stones. It is hoped that with development of the standard will come inclusion of more products across a wider range of companies. Dr Miles Watkins, director of group environmental and corporate social responsibility at Aggregate Industries, said, "Sustainability is a core priority for Aggregate Industries and as part of the continual improvement of our business we are taking major steps to address this issue." Marketing Director at Marshalls Plc, Chris Harrop, said, "As a leader in our industry, we have been managing and reducing our carbon impact as a corporate objective since 2002 and earlier this year Marshalls launched the industries first ever carbon calculator. A single methodology and defined labeling scheme across all industries is key to accelerating consumer confidence and acceptance."

October 2007 - "An environmental consultancy has developed an online calculation method to calculate the embodied carbon dioxide in building materials. The Edinburgh Centre for Carbon Management, part of the Camco environmental group which also owns consultant ESD, said the tool would be a valuable aid to the construction industry. Richard Tipper, Director at ECCM, said, "We receive lots of enquiries from the construction industry, all wanting to understand and analyse the carbon dioxide emissions of the materials used in building - the building's material footprint"."

November 2007 - "The Pines Calyx in Kent, which won small project of the year in last night's Sustainability Awards, offers a blueprint of environmental best practice, both in sustainable construction techniques, embodied energy and water and waste management. With energy data consumption attached. * UK's most sustainable conference and events venue which aims for full carbon-neutrality in three years. * Full data on energy use of the Kent scheme and embodied energy used. Also attached documents on design principles and Timbrel construction technique. * Techniques used on the scheme include a rammed earth and "timbrel dome" method first used by Spanish-American architect in 1885. * Stand-out winner of this year's Building Sustainability Awards."

December 2007 - "The British Precast Concrete Federation has launched a charter to encourage member companies to go beyond legislation in making their products and operations more sustainable. The sustainability charter outlines a series of principles that companies who sign the charter must commit to. These include using energy more efficiently and reducing carbon footprint, using primary materials more

efficiently and promoting the use of secondary materials and to use water more efficiently and minimise demand on the mains water supply. Martin Clarke, chief executive of British Precast said. "We encourage all our members to sign up but at the same time advise that it is a serious decision needing full commitment to achieve the objectives". Member companies who have already signed up to the voluntary charter include Aggregate Industries, Cornish Concrete, Hanson, Litecast, Marley Eternit, Marshalls, Tarmac and Trent Concrete."

December 2007 - "The UK Green Building Council's radical new report "Carbon Reductions in New Non-Domestic Buildings" is today being published on the Communities and Local Government (CLG) website. The reporting process itself is pioneering. Commissioned by CLG, the report is the result of several months of work by a number of UK-GBC members - some of them competitors - who have shared data and collaborated over the project..."

While U.S. politicians and scientists spend their time arguing about whether or not global warming is happening or is being caused by human activity, the UK has come up with a remarkable plan of action to improve energy efficiency while also greatly reducing the production of carbon dioxide. It is up to local jurisdictions in this country to follow the lead of the U.K. and become a grassroots force of change that the U.S. government will eventually have to listen to. Montgomery County can get in on the ground floor of this top environmental priority and become a national leader, rather than waiting, as it often does, to become a follower of other jurisdictions. We can help direct the debate and the eventual programs if we are willing to leapfrog the current rudimentary U.S. thinking and look to the U.K. model as the standard to meet and even to beat.