

Come to Greenbuild 2006 A Step In The Green Direction

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The movie "An Inconvenient Truth" has both heightened awareness of the global warming issue and re-kindled the pseudo-debate over the extent that global warming is human-caused or a serious threat.

A number of environmental issues have been receiving increased awareness recently and seem to be building to a climax. Global warming, rapidly rising fuel costs, increasingly severe weather, indoor pollution, environmental pollution from tens of thousands of toxic substances like mercury and pesticides, and many other hazards seem to be choking us and leaving despair in their wake. On top of that, I've seen the world population increase from 2 billion to 6.4 billion and may well see 12 billion in my lifetime on a planet that can provide good nutrition and a healthy life to about 4 billion. We continue to see wars fought over oil. With problems so big, we wonder what we as individuals can possibly do.

The naysayers notice that some causes of global warming are natural and then extrapolate that to claim that all the problems are imaginary. But that argument is a red herring. Science tells us that there are many causes of global warming, one of which is human activity. Recent science is more and more convincingly determining that human activity has become the dominant force in climate change and global warming. The extent of that impact is frightening. Graphs shown in the movie "An Inconvenient Truth" make that point quite clear. So it is also true of other human insults to our Mother Earth.

Many of us have chosen to start with our buildings to begin to address this multitude of problems. Since buildings account for 30% of U.S. greenhouse gas emissions, 70% of U.S. electricity consumption, 39% of U.S. primary energy use (including fuel input for production), and use 40% of raw materials globally (which is 3 billion tons annually), this is a logical place to start. We can also address many indoor air problems with buildings as that is where all the indoor air is found. Many of us spend most of our life in buildings so we are impacted by poor lighting that gives us headaches and fatigue; toxin out-gassing furnishings, paint, and other materials degrade our health and make us susceptible to asthma, cancer, and other diseases; and tight buildings coupled with mechanical systems that do not provide enough fresh air.

The US Green Building Council has developed a green building rating system so that all of us, as consumers, can have a better idea of which buildings really are green and not just marketing hype (or “green-washed”). The system is LEED – Leadership in Energy and Environmental Design. Buildings can presently achieve a Basic Certified, Silver, Gold, or Platinum level of certification. As the market adapts, the standards will progressively be upgraded so that a LEED rated building is always a step above the average building on the market. As an aside, and contrary to the conventional “green” wisdom, this means that LEED buildings in general (with some exceptions) will by definition be nearer to the leading edge of the curve, and therefore a little more expensive (in up-front costs). For a more holistic picture, a life-cycle analysis is very helpful.

The LEED rating system addresses five basic areas: Sustainable use of sites and landscapes; non-toxic and sustainably produced materials; energy consumption; water use; and indoor environmental quality.

Why is this just a start? What does LEED save? On average (all LEED levels), the savings have been about 30% in energy.

Lets do A Little Math:

- 15% of humans use 53% of all world energy. Lets assume we want to normalize that so that everyone gets the same energy allocation.
- To equalize the worldwide energy allocation, that means everyone would use 12% of present total
- That means the 15% currently using the most would reduce by 73%
- Then the 85% using the least would increase by 100%
- Some areas of our economy will find it harder to reduce, and buildings can take up some of the slack.
 - A reasonable and necessary Buildings Goal: reduce energy use by 90%
 - Saving 30% is a “good start”, remarkable even, but we still have a lot of work to do beyond that beginning
 - The 30% savings are only for LEED buildings, and that is only an average. Actual performance for individual buildings varies significantly. Some non-LEED buildings also save considerable energy. Most buildings, however, do not.

From a little math, it should be apparent that what might seem to be far-reaching goals are indeed achievable. For example, we as an industry basically know how to achieve net-zero energy residential buildings in many circumstances. In concept it is surprisingly simple (more complicated in actual practice):

- First, reduce the energy consumption of the building and enclosed processes as much as possible, including extensive use of glare-free daylighting and passive designs where applicable.

- Second, install low-energy mechanical and electrical systems to supply the remaining heating, cooling, process, and lighting needs.
- Third – obtain the remaining energy needs from renewables.

The math shows us that if the 15% of us presently using the most only reduce by 73%, then overall world energy use will actually increase if the rest of the world catches up with us in consumption, and that does seem fair, yes? So we must do more. I think 90% reduction from 1990 levels is a more appropriate goal if we truly want to achieve a good result.

A 90% reduction from 1990 usage levels seems like a lot, yet the 7-wedges concept discussed extensively at **Solar 2006** addressed clear paths to 80% reductions from 2006 levels. The 7-wedges are basically:

- Energy Efficiency
- Wind
- Biofuels
- Biomass
- Photovoltaics
- Central Solar Power
- Geothermal

For an in-depth article on the 7-wedges concept and more, see “Tackling Climate Change”, a Searchable PDF at www.ases.org/climatechange

Indeed a lot of time has been lost since 1990, but it is important to avoid the illusion of thinking that reducing from current levels is really accomplishing enough if we allow the “current levels” to continuously increase, as has been the case. So lets stick with 1990 as the baseline and make some real, beneficial progress.

What can we as individuals do? There are of course all the little around-the-house energy saving tips that have become so popular. But how much, really, will they save? 90%? - hardly. We as individuals will need to band together to influence national and international policy, and then collectively the 90% reductions become possible. A good first step is to learn about the issues and the existing solutions. A little hint – did you know that changing from a carnivorous diet to a vegan or mostly vegan diet will save more energy than not driving at all (in the USA anyway)? We do, indeed, have a lot to investigate.

A great opportunity in Denver is coming up in November at Greenbuild 2006. This will be a collection of the world’s leaders in sustainable design and will include over 700 product and service exhibits and 16 simultaneous tracks of speakers.

I’ll see you there!