

PROMOTING BUILDING **ENERGY** EFFICIENCY

by Doug Seiter, LEED AP

There is little room remaining for debate on the issue of global climate change: it is happening and we must deal with it. By most credible accounts, we have less than ten years to stabilize and begin a downward trend in carbon emissions in order to mitigate catastrophic consequences. Daunting, yes—but not impossible. Part of the solution lies in the construction of high-performance buildings. The increasingly popular concept of “green building,” a major component of global sustainability, evokes a broad range of features from the use of on-site or recycled-content materials to water-efficient landscaping, but there is no escaping the fact that a truly green building is at its core an energy-efficient building.

A 2007 report by the American Solar Energy Society, “Tackling Climate Change in the U.S.: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy by 2030,” includes a chart projecting reasonable reductions in carbon emissions through a combination of efficiency strategies—which include buildings and transportation—and renewable energy (Figure 1). This graphic dramatically illustrates how energy efficiency measures alone have the potential to keep our nation’s carbon emissions roughly constant over the next twenty-four years, with a combination of renewable energy strategies further driving emissions downward.

Vehicles are often thought to be at the top of the greenhouse gas emission list, but buildings actually have a far greater impact. While the majority of autos and light trucks could be turned over in about twelve years to more efficient models, buildings are typically in use—and consuming energy—



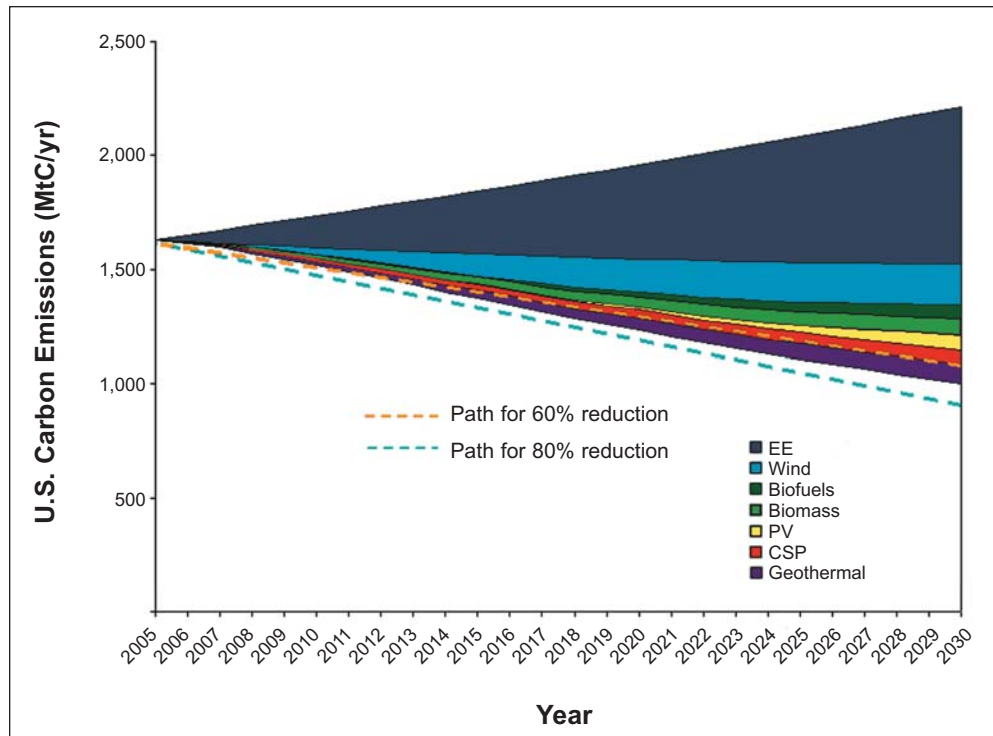


Figure 1. U.S. carbon displacement potentials by 2030 for energy efficiency, wind power, biofuels, biomass, photovoltaics, concentrating solar power and geothermal power.

for at least twice that and sometimes substantially longer. Current building energy sources are coal, oil and natural gas. While coal is available in relative abundance and the primary fuel for electricity generation in the U.S., “clean coal” technologies are still in development and decades from common use. In the meantime, because it is market-ready and relatively low-cost, energy efficiency is the most effective way of reducing emissions from the generation of electricity.

An energy-efficient building package involves good design, efficient materials and equipment, and technology—in that order. Good design includes paying attention to how the sun can help warm and illuminate the building through thoughtful placement of windows. Even with less than optimal building orientation, high performance windows, well-insulated walls, a tighter envelope and properly sealed ductwork interact to keep heat isolated. After consideration has been made to make an occupied space “inherently comfortable” (livable even if the utilities are down for a few days), the heating, cooling and ventilation systems can be sized to lower load requirements in order to run more efficiently. Finally, when the energy requirements of the building have been

reduced, adding technologies such as sophisticated controls and renewable energy systems begin to make more sense.

We know how to do this. The most adaptable solutions are neither new nor prohibitively costly: they involve sensible design, good material choices and approaching a building as a system. Also required is a commitment from builders to educate their staff and customers, and from building departments to affect the necessary cultural shift

acknowledging that building energy efficiency is a critical health and safety issue, particularly when considered in a global context.

Codifying Green

Lately, numerous jurisdictions have begun to consider adopting “green” building code provisions in response to the urgent global condition and the acceleration of energy challenges. This can be approached in several ways.

The least sensible approach is for jurisdictions to create their own provisions, which can lead to regional confusion at the very least. Another approach is to adapt a successful voluntary program like Built Green Colorado or Atlanta, Georgia’s, Southface Earthcraft House, or to codify aspects of the Leadership in Energy and Environmental Design (LEED) rating system, Green Globes rating system, or other market-based programs. Each of these approaches can stifle motivation for innovation and competition, and seldom yield the level of performance desired.

A third approach is to incorporate green building best practices through the model code development process. This brings all interested parties together on a regular

basis to evaluate the available options, including the consideration of larger-scale market and business realities. One final approach is to offer voluntary programs as compliance options. This allows market-driven programs to continue to operate independently, which can serve the goal of continuous improvement more effectively than regular development and adoption cycles. Several jurisdictions across the country have used this approach to ease the burden on code officials and, coincidentally, stimulate the growth of small businesses that offer quality control services to builders. The end result can be a healthier relationship between the building industry and government.

A New Normal

Anyone who thinks that the emphasis on building energy efficiency will diminish any time in the foreseeable future is certain to be disappointed. If anything, energy-efficient system design will take its rightful place as a fundamental element of quality construction, and the growing interest in building science and subsequent

blooming of an industry education infrastructure is already helping building departments large and small redefine their roles in the protection of public health, safety and welfare.

There is every reason to look forward to a rapidly approaching “new normal” when high-performance buildings are not the exception but the rule. Instituting energy efficiency as a core element will require a concerted and coordinated effort, but—as we have seen—is an absolutely crucial early step to achieving a long-term solution to global climate change. ♦

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