

PERSPECTIVE

WHAT IS



A CARBON FOOTPRINT?

and HOW CAN YOU REDUCE YOURS?

by **Kenneth B. Jones, AIA, LEED AP**

Over the past several years, terms such as “green building,” “sustainable design,” and “LEED Certified” have become commonplace within the design, construction, and facilities management industries. The trend toward more environmentally conscious buildings is gaining momentum. In fact, many government and private organizations are beginning to require that all of their new and renovated buildings be designed and constructed to obtain LEED (Leadership in Energy and Environmental Design) Certification through the U.S. Green Building Council (USGBC).

The building industry’s impact on the environment is substantial when we consider that the USGBC estimates that approximately 65 percent of all electricity generated by power plants is used to operate new and existing buildings. Generating this amount of electricity through the consumption of fossil fuels (crude oil, natural gas, etc.) causes large amounts of carbon dioxide (CO₂) to be emitted into the atmosphere.



WHAT IS A "CARBON FOOTPRINT"?

The scientific community generally agrees that emission of carbon dioxide and other greenhouse gasses (GHGs) into the earth's atmosphere will be primary contributors to changes in the earth's climate over the coming decades. As carbon dioxide is released into the atmosphere, it accumulates and forms a barrier, trapping the heat created from the sun and increasing the temperature of the earth. The term *carbon footprint* is used to quantify the

THE 2030 CHALLENGE

In response to growing concerns about how buildings are affecting the environment, the American Institute of Architects (AIA) has supported the 2030 Challenge, promoted by the organization Architecture 2030. The 2030 Challenge calls for a 50 percent reduction in the amount of fossil fuel consumption by the year 2010 and an additional 10 percent reduction every five years after that, with the ultimate goal of buildings that are "carbon-neutral" by the year 2030. The term "carbon-neutral" refers to buildings and activities that result in a net quantity of carbon emissions equal to zero.

Some energy-saving strategies that can be applied to both new and renovated facilities include properly insulating the building, installing a highly reflective "cool" roofing system, and incorporating natural heating, cooling, and ventilation into the design. Installing photovoltaic (solar) panels on a roof can reduce the amount of electricity required to be purchased from fuel burning power plants. Commissioning, and later recommissioning, building systems will ensure that they are operating at optimal efficiency. For additional strategies related to renovation and facility upgrade projects, refer to the LEED guidelines for Existing Buildings (www.usgbc.org).

THE 2030 CHALLENGE CALLS FOR A 50 PERCENT REDUCTION IN THE AMOUNT OF FOSSIL FUEL CONSUMPTION BY THE YEAR 2010 AND AN ADDITIONAL 10 PERCENT REDUCTION EVERY FIVE YEARS AFTER THAT, WITH THE ULTIMATE GOAL OF BUILDINGS THAT ARE "CARBON-NEUTRAL" BY THE YEAR 2030.

impact that a building, an individual, or an organization has on the environment relative to the quantity of CO₂ it emits into the atmosphere. Some organizations have created spreadsheets that will allow you to calculate your carbon footprint and have made these available on the Internet. One good example can be found at www.cleannair-coolplanet.org. Generally, your carbon footprint will be measured in tons per year of CO₂ emissions.

WHAT CAN YOU DO TO MOVE TOWARD CARBON NEUTRALITY?

Whether you are an owner, a contractor, or an architect, one simple answer in how to move toward carbon neutrality is to design and construct buildings that require far less energy to operate than the typical buildings that have been constructed in the past. For new facilities, there are many ways in which this can be accomplished. Begin by following the LEED guidelines for New Construction established by the USGBC. Some strategies include properly locating and orienting a building on its site to take advantage of the path of the sun, optimizing the building's form to minimize environmental impact, and carefully considering the size and location of windows to incorporate day-lighting strategies. Preserving the quantity of existing trees on a site and reforestation efforts can help offset carbon dioxide that is released by your facility, as trees absorb and store CO₂.

KEY MOMENT IN THE PROCESS

We are at a critical point in the history of design and construction. As stated in a report by the AIA titled Architects and Climate Change:

About 5 billion square feet of new construction, 5 billion square feet of renovation, and 1.75 billion square feet of demolition takes place in the United States each year. By the year 2035, three-quarters of the built environment in the U.S. will be either new or renovated. This transformation over the next 30 years represents a historic opportunity for the U.S. architecture and building community to lead in addressing greenhouse gas emission reductions.

Understanding and implementing design, construction, and operational strategies to reduce your carbon footprint will result in buildings that are more energy efficient, cost less to operate, and greatly reduce their negative impacts on the environment. ☎

Ken Jones is a vice president with Grimm + Parker Architects, Calverton, MD, and a licensed architect and a LEED Accredited Professional. E-mail him at kjones@gparch.com. This is his first article for *Facilities Manager*.