



Quantum Environmental & Engineering Services, LLC (QE²) has been in the business of sustainable practice since its inception in the late 1980's, even though the terms "Green" and "sustainability" were not necessarily applied to the work that we did then. In those days, QE² and the businesses and governments we worked for were busy meeting the compliance regulations for things like:

- Solid and hazardous waste containment and management
- Pollution prevention and waste minimization
- Soil and groundwater cleanup and management
- Air emissions permitting and management

The list goes on, but it suffices to say that all these activities were undertaken in response to the recognition, through regulatory promulgation, of the need to protect our resources from the negative impacts of inefficient processes and materials management practices.

Since then, with the confluence of need, knowledge and global political circumstances, the "Green" or "Sustainability" movement has taken on a new importance, a sense of urgency, and a broader range of social acceptance. Factors that have accelerated the movement include:

- Advancement of concern over climate change and its potential impacts
- National security concerns over the availability of ample domestic energy reserves to sustain economic prosperity and national defense interests
- Recognition that sustainable practice not only improves the future outlook for our human and natural resources, but that it makes practical business sense by reducing operating and maintenance budgets.



Numerous groups and organizations have developed "Green" or "Sustainability" programs. More and more, Federal government contracts require demonstration of life cycle sustainability in design and construction. There are certifications and bodies of practice to help encourage a broad-based process of cultural change that will lead to improved long-term sustainability in business, industry, economic development, and individual practice. The United States Green Business Council (USGBC) is one of the leading organizations in this area. Through their Leadership in Energy and Environmental Design (LEED) program, the USGBC has established professional certifications, standardized building design and operations practice, and construction criteria for life cycle sustainability.

QE² – Example Project – Greening our Business

QE² has been proactive in its own internal push for sustainable practice. QE² was recently identified by the Knox Area Chamber Partnership as a Green Partner for voluntarily selecting sustainable practices and methods to improve its efficiency and reduce energy and carbon consumption. Sustainable practices adopted by QE² to improve sustainability include:

- Electricity reductions through HVAC management, use of low energy fluorescent lighting, reduced indoor and outdoor lighting, and reduced off-hours computer “idling”
- Water savings and plastic bottle reduction through the use of low flow restroom fixtures and encouraging use of bulk bottled water
- Recycling all paper, plastic and metal products used in the office
- Recycling wastes and systems used and recovered as a part of routine environmental services work
- Evaluating QE²'s Carbon Footprint and targeting methods for reducing it.

Carbon Footprinting is the term applied to the practice of measuring an organization's impact on the environment by estimating the mass of carbon discharged as air emissions by either direct or indirect means. Estimating an organization's Carbon Footprint provides a quantitative benchmark for understanding its facilities and infrastructure, operating practices, and materials selection and use practices. The Carbon Footprint then provides for a starting point to identify the means by which a reduced Carbon Footprint can be achieved, thus reducing the organization's impact on air quality both directly and indirectly.

QE²'s Carbon Footprint was calculated from 2009 energy consumption and operations data. The calculation is accomplished by taking into account CO₂ emissions related to direct and indirect sources. Direct sources are both stationary and mobile. Stationary sources include electrical and natural gas consumption for lighting and heating/cooling. Direct mobile sources include fuel consumption to operate motor vehicles and equipment. Indirect sources of CO₂ emissions are related to the products and materials used by the organization and can include everything from paper and office products to building maintenance products and replacement materials.

Taking into account printer and copy paper as QE²'s primary indirect source, total CO₂ emissions resulting from QE²'s operation in 2009 is approximately 515,000 pounds. Average monthly emissions from direct and indirect sources are summarized below.

Overall Monthly Average CO₂ Emissions

	CO ₂ emission (lbs)
Gasoline	16,699 lbs
Diesel	2,900 lbs
Electricity	18,605 lbs
Natural Gas	3,678 lbs
Paper	1,065 lbs
Total	42,947 lbs

QE² – Example Project – Greening our Business

Steps taken to reduce QE²'s Carbon Footprint were undertaken in early 2010. These steps included:

- Installing high efficiency fluorescent electric bulbs
- Instituting the practice of reduced internal lighting and shutting lights off when not present
- Reducing computer idle time
- Reducing and combining service trips to reduced gasoline and diesel consumption
- Paper use reduction policies
- Recycled, low density paper usage for “draft” and internal paper consumption

QE² will recalculate its Carbon Footprint at the completion of 2010 and report on the efficiencies gained (in dollars) and the benefit to the atmosphere (in pounds CO₂). QE² can assist your organization in understanding the environmental impact of operations, means for impact reduction, and of course, business overhead savings.