

Energy & Water Efficiency

Energy use in controlled environments for agriculture can be quite intensive. However, the key metric should not be total energy consumed per square foot, the typical metric used to look at energy use intensity for buildings. For agricultural occupancies the only question is, can I produce more product per unit of energy using one environmental control approach versus another. The total energy used to produce a pound of product is more relevant to agricultural facilities. Thus, the pounds of product produced annually per square foot, and the total energy used, result in a meaningful way to compare alternative systems and approaches.

A preliminary study of one crop suggests that an indoor, controlled environment could yield the same energy use intensity as a traditional greenhouse (kBtu per pound of product per year), but offers the added benefit of the potential for significant water use reductions (theoretically as much as a 95% reduction), elimination of pesticide use, and improved quality control. Indoor environments can also extend growing seasons in many climates, allowing food to be grown near the wholesale/retail markets, further improving the economics due to reduced spoilage and reduced transport energy. These factors combined could lower the carbon footprint of an agricultural product quite significantly. For more information on Energy & Water Efficiency, visit us at www.GB-AiCE.com or contact Jeff Blaevoet at jblaevoet@gb-eng.com.