

Sustainability Implementation in Modern Design



Sustainability refers to the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Our culture is becoming increasingly focused on sustainability, and it has become an essential consideration for modern design and construction. Engineering and construction professionals can have a huge impact on climate change by incorporating sustainable design components and construction methods. Alongside our clients, we can make decisions that will promote healthier, more resilient futures for our communities.

In the context of engineering and construction, sustainability encompasses a wide range of aspects including energy efficiency, optimization and conservation of natural resources, reduction of greenhouse gas emissions, waste reduction, clean construction and renewable energy. Making appropriate sustainable design decisions during planning, design and construction can save money in the long run by reducing energy use, extending the life of the asset thereby reducing reconstruction costs, and reducing operation and maintenance costs.

When considering greenhouse gas emissions associated with a project, we must consider operational carbon as well as embodied carbon. Operational carbon includes emissions associated with providing heating, cooling, lighting, ventilation and power. Embodied carbon is defined as the total carbon emitted to extract, manufacture, transport and install materials used in the construction of the project. Consideration of embodied carbon is relatively new and requires project teams to more thoughtfully consider lifecycle assessment, material reuse and recycling. Some ways design professionals can reduce embodied carbon include reusing materials, specifying products and materials with low amounts of embodied carbon as disclosed by the manufacturer, sourcing more local materials, and using pre-fabricated components.

Several frameworks for sustainable design (e.g., LEED, Envision) have been developed as the concept has become a major focus around the country and the world. These provide criteria and performance objectives to help project teams identify sustainable approaches over the life of the project including operations and maintenance.

Sustainability is a core service JKMuir provides to our clients. Our experience with sustainability includes analyzing the feasibility of renewable energy technologies; demonstrating renewable energy implementation costs and return on investment; greenhouse gas accounting; Envision certification; evaluating the viability of anaerobic digestion and cogeneration; developing and modeling emission reduction strategies; and applying for government funding programs that support sustainability, subsidize pilot studies and finance emissions reduction and on-site energy generation.