FACT SHEET

Concrete Thinking for a sustainable world

Concrete Facts About Sustainability

In an effort to reduce the overall energy consumption of the country, all industries are embracing the concept of sustainable development—the ability to build the facilities and structures we need today without depleting resources for the future. Sustainability seeks to balance the economic, social and environmental impacts, recognizing that population growth will continue.

Sustainable development is a challenge because it is difficult to determine the appropriate level of energy use. We need to look at a number of environmental, economic, social and safety issues and take a long-term view on when and how resources should be applied for the common good. Most importantly, we want to reach a balance where we do not create an "environmental debt" to ensure future generations have the same choices with energy usage that we do.

Sustainable development challenges the design and construction industry to create buildings that acknowledge the life cycle of a building. Recognizing that operating a building over time is far more energy intensive than developing it, demand for durability and energy performance is growing.

Architects, engineers and builders are choosing concrete for its durability, recycled ingredients, and energy efficiency not found in other building materials like steel or wood. When compared with other building materials, concrete is a responsible choice for sustainable development.

Durability Means Longer Lasting, More Efficient Structures

Durability is a significant sustainable attribute of concrete because it will not rust, rot, or burn, requiring less energy and resources over time to repair or replace. Concrete builds durable, long-lasting structures including sidewalks, building foundations and envelopes, as well as roadways and bridges. As the most widely used building material in the world, concrete structures have withstood the test of time for more than 2,000 years. Because of its longevity, it can be a viable solution for environmentally responsible design.

Energy Efficiency Optimized

Structures built with insulated concrete have optimal energy performance. Homes and buildings constructed from insulated concrete walls are not subject to large daily temperature fluctuations. This means home or building owners can lower heating and cooling bills up to 25 percent–and occupants within these structures are more comfortable. Also heating, ventilating, and air-conditioning can be designed with smaller-capacity equipment.

Additionally, concrete minimizes the effects that produce urban heat islands. Studies have shown that urban environments have higher temperatures in areas where there are few trees, and a multitude of paved surfaces and buildings. This additional heat causes air conditioning systems to work harder, which uses more energy (up to 18 percent more) and promotes the formation of smog. Light-colored concrete absorbs less heat and reflects more light than dark-colored materials—thereby reducing heat gain. Light colored pavements also require less site lighting to provide safe night-time illumination levels, whether on parking lots, driveways, or sidewalks

Recycling Key Focus to Improve Manufacturing Process

In concrete's life cycle, recycling is present from the beginning–many wastes and industrial byproducts like fly ash that would otherwise clog landfills can be added to concrete mixes. These by-products also reduce reliance on raw materials. For example, In 2001, the concrete industry used 11,400,000 metric tons of fly ash—a byproduct of coal combustion at electric power utility plants.

Concrete is easy to use and can be readily recycled. Delivered and prepared for each specific project, concrete typically produces very little waste.

Finally, when a concrete structure has served its purpose, it can be recycled as aggregate in new concrete paving, backfill, or as road base. Even the reinforcing steel in concrete (which often is made from recycled materials) can be recycled and reused.