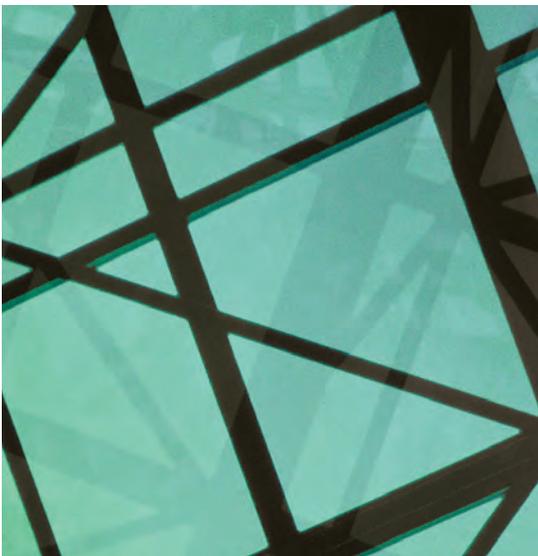




Consultative Council on: Sustainability of the Built Environment



Sustainability is a set of environmental, economic and social conditions in which all of society has the resilience, capacity and opportunity to maintain and improve its quality of life indefinitely without degrading the quantity, quality or availability of natural, economic and social resources.

The built environment (which encompasses industrial facilities, and communications, energy, transportation, waste and water infrastructure, in addition to buildings of all types) shelters and supports most human activities and represents a large proportion of a nation's wealth. It serves a vital role in mitigating the harmful effects of natural and man-made hazards and providing measures to help society reduce climate change impacts and adapt to its effects.

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Sustainability of the Built Environment

Sustainability of the built environment denotes that constructed facilities, over their entire life cycle (typically 50 to 100 or more years) maintain and improve the communities they serve and affect economically, environmentally and socially. (For instance, an office building serves its occupants and affect its neighbors.)

To achieve sustainability in the built environment requires:

- Establishment of collaborative efforts across the building community that include citizens, constructors, designers, educators, advocates, financiers, insurers, manufacturers, occupants, operators, owners, policy makers and regulators.
- Research and development to allow prediction of the life-cycle impacts of economic, environmental and social consequences of various actions.
- Development of practices, standards, codes and guidelines that capture the diversity of sustainability-related knowledge to facilitate sustainability-focused decision making over the whole life cycle of the built environment.
- Providing education and certifications for the entire building community that focus on the connection between sustainability and a practitioner's everyday work. This community includes all professionals, technicians and trades involved in planning, design, construction, operation and maintenance of the built environment. Educating elementary school-aged students in sustainability also is vital for the future workforce of the building community, and for all future adults who will be stakeholders in the sustainability of the built environment.
- Dedicating financial resources and incentives toward achieving sustainable whole life cycle performance for constructed facilities, with consideration of real energy and water costs; recognition of occupant productivity and well-being; and community values.
- Engaging the public in understanding and supporting constructed facilities that contribute to sustainability.
- Establishing performance-based regulations and streamlined regulatory procedures that support efficient collaborations among proponents, stakeholders and regulators to achieve projects that meet requirements for public health, safety, welfare and environmental quality.

Adaptation of the Built Environment

Because buildings and other constructed facilities will need to function over their 50 to 100 year life-cycle, it is important that they withstand whatever climactic changes occur over their lifetime. These include:

- Functional requirements for services (such as changes in population, settlement patterns, employment, commerce, economic resources and life styles), availability and costs of resources (such as energy and water), and
- The extreme environments in which facilities are expected to be functional and resilient (such as heat waves and cold freezes; wind, rain, snow and ice storms; droughts, floods and storm surges; wildfires; and accidental and willful hazards resulting from human activities).

Development of an effective adaptation strategy for the built environment is complicated by the interdependence of constructed facilities. For example, power plants cannot function without water and water distribution systems cannot function without power.

Research and development efforts are needed to:

- Define the extreme environments for which facilities should be designed, constructed, operated, maintained or renovated, and/or for which their vulnerabilities should be assessed.
- Facilitate and expedite the development and implementation of standards, practices and regulations that will guide and govern how the built environment adapts to a changing climate.

While scientists have developed some rational predictions on the results of climate changes (e.g., regional average annual temperatures and precipitation), no such predictions exist on how such changes will impact a constructed facility's ability to meet citizens' demand for services or to remain safe, functional and resilient in future extreme environments.

Historically, the designation of an extreme environment has not been based on climate or weather models but, rather, by statistics of historical records. With climate and weather patterns changing, historical records no longer are adequate predictors of future extremes. However, advanced modeling capabilities potentially can provide useful predictions of extreme environments.

The building community must engage with climate and weather scientists to help identify the information required to make necessary building adaptations, and to develop the practices and standards needed by the private and public sectors to adapt infrastructure systems to climate change. In the interim, for the facilities being designed or operated now, the professional and science communities must collaborate to provide practical guidance in preparing for anticipated extreme environments.



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