

RENEWABLE ENERGY
AND ENERGY
EFFICIENCY IN
RESIDENTIAL,
COMMERCIAL AND
INDUSTRIAL BUILDINGS



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What is renewable Energy?

**Energy that comes
from natural resources
that are naturally
replenished**

Sunlight

Wind

Rain

Tides

Geothermal Heat

**Problems with
efficiency that have to
do with current
buildings Structures**

**How to make
buildings Energy
Efficient**



**optimize the site
Potential**

- proper site selection,
 - The location,
 - the orientation, . . .landscaping of a .transportation building, a campus, or a large complex such as a military base.
- The site of a sustainable building should reduce, control, and/or treat storm-water runoff.

**optimize the
energy potential**

With ever-increasing demand on fossil fuel resources and growing concerns about energy independence and security, and impacts of global climate change becoming more evident,

it is essential to find ways to reduce energy load, increase efficiency, and maximize the use of renewable energy sources in federal facilities.

- Improving the energy performance of existing buildings is important to increasing our energy independence.
- Government and private sector organizations are

**Protect and
Conserve Water**

Building fundamentally change the ecological and hydrological function of non-built land,

- a sustainable building should seek to minimize the impervious cover created through practices that can reduce those impacts while using water efficiently, and reusing or recycling water for on-site use, when feasible.

- The effort to bring drinkable water to our household faucets consumes enormous energy resources in pumping, transport, and treatment. Often potentially toxic chemicals are used to make water potable. The environmental and financial costs of sewage treatment are significant.

Optimize Building Spaces and Material use

While the world population continues to grow (to more than 9 billion by 2050), consumption of natural resources will continue to increase and the demand for additional goods and services will continue to stress available resources.

It is critical to achieve an integrated and intelligent use of materials that maximizes their value.

A sustainable building is designed and operated to use and reuse materials in the most productive and sustainable way across its entire life cycle. The materials used in a sustainable building minimize life-cycle environmental impacts such as global warming, resource depletion, and toxicity.

Environmentally preferable materials reduce impacts on human health and the environment, and contribute to improved worker safety and health, reduced liabilities, and reduced disposal costs.

Enhance Indoor Environmental Quality

The indoor environmental quality (IEQ) of a building has a significant impact on occupant health, comfort, and productivity.

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Among other attributes, a sustainable building maximizes daylighting, has appropriate ventilation and moisture control, optimizes acoustic performance, and avoids the use of materials with high emissions. Principles of IEQ also emphasize occupant control over systems such as lighting and temperature.

**Optimize
Operational and
Maintenance
Practices**

Consideration of a building's operating and maintenance issues during the preliminary design phase of a facility will contribute to improved working environments, higher productivity, reduced energy and resource costs, and prevention of system failures.

Encourage building operators and maintenance personnel to participate in the design and development phases, to ensure optimal operations and maintenance of the building and the features such as stormwater facilities designed to reduce the impact of the building on the land.

Designers can specify materials and systems that simplify and reduce maintenance requirements; require less water, energy, and toxic chemicals / cleaners to maintain; and are cost-effective and reduce life-cycle costs.

Design facilities to include metering, to track the progress of sustainability initiatives, including reductions in energy and water use and waste generation, in the facility and on-site.



Ghana Green Building Council (GGBC) is a non-governmental organization and private-public partnership that is committed to help create sustainable buildings/communities in Ghana using energy savings, water conservation, resource management and cost-efficient techniques.

The GGBC provides green building resources, education and leadership opportunities to all stakeholders in the construction industry to help in the transformation process towards sustainability.