

CONCEPT With scientists worldwide alarming the world about the increasing dangers and costs of climate change, there are current energy innovations that could transform how today's technologies reduce the effects of global warming.



BACKGROUND

- Renewable energy is energy produced from sources like the sun and wind that are naturally replenished and do not run out.
- Solar power is energy from the sun that is converted into thermal or electrical energy.
- Thermal energy (also called heat energy) is produced when a rise in temperature causes atoms and molecules to move faster and collide with each other.
- Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.
- Global warming is the long-term heating of Earth's surface.

REAL WORLD CONNECTIONS

When we think of energy innovations, certain vocabulary is associated with this term including:

- Solar energy
- Thermal energy
- Climate change
- Global warming
- Renewable energy



APPLICATION / EXPERIENCE

Make sure it measures up

A Zero-Energy Building (ZEB) or Net Zero-Energy (NZE) building, is a structure with net zero energy consumption, meaning the total amount of energy used by the building on a yearly basis is equal to the amount of renewable energy created on or off site, using technology such as heat pumps, high efficiency windows and insulation, and solar panels.

The goal is that these buildings contribute less overall greenhouse gas to the atmosphere during operations than similar non-ZNE buildings. They do, sometimes, consume non-renewable energy and produce greenhouse gases, but at other times reduce energy usage and greenhouse gas production elsewhere by the same amount. The development of zero-energy buildings is encouraged by the desire to have less of an impact on the environment, and their expansion is encouraged by tax breaks and savings on energy costs which make zero-energy buildings financially viable.



REAL WORLD CONNECTIONS

There are 10 new sustainable innovations within the energy industry including:

- Solar-powered trains
- Artificial photosynthesis
- Waste-powered airplanes
- Tidal energy
- Solar roof tiles
- Carbon nanotube electricity
- 3D printed solar trees
- Liquid sunlight
- Electric tires
- Lithium glass batteries



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