

Can net zero energy redefining sustainable architecture in Iran?

This paper introduces an innovative approach that combines Net Zero Energy (NZE), Net Zero Carbon (NZC), and Regenerative principles, redefining sustainable architecture in Iran. Focusing on a residential "attached house," the study employed strategies like thermal insulation, Low-E glass, shading, and renewable energy sources.

What is a zero-energy building?

The goal of designing zero-energy buildings is not only to minimize the building's energy demand using passive design methods while providing thermal comfort but also to build a building that meets its energy demands through active methods and renewable technologies.

What is a net-zero energy building (NZEB)?

Today, one of the useful methods to reduce energy consumption and greenhouse gas emissions in the building sector is the design of a Net-zero Energy Building (NZEB), which has been noticed in recent years. For example, the United States of America has passed a law that by 2050, all buildings must be Near Zero Energy Buildings (NZEB).

Can solar energy be used to build a zero-energy building?

The obtained results showed that with the efficient use of renewable energy, it is possible to achieve a zero-energy building in Morocco (Abdou et al. 2021). Also, in 2014, Eshraghi et al. studied the potential of using solar energy in the design of a zero-energy building in Tehran.

Can a building achieve a net-zero energy balance?

While these buildings may not achieve zero energy consumption at all times, they aim for a net-zero balance annually. Developed countries like the UK have introduced regulations promoting nearly zero energy buildings (nZEBs).

How to achieve a low-energy building using common passive strategies in Iran?

In order to achieve a low-energy building using common passive strategies in Iran, the following measures have been employed, including insulation, improving windows with Low-E glass and shading devices, and ultimately enhancing the walls by replacing the system with Rammed-Earth construction (models BM0 to RM4).

In this research, a combination of passive and active methods is used to design a nearly zero energy building in four major climatic regions of Iran, including cold, mild, dry-warm, and wet ...

In this research, a plan to implement a zero-energy building (ZEB) for a hot and dry climate region of Iran (Yazd) is introduced and a comparison with a typical house of that climate is performed. ...

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