



MODERN ARCHITECTURE AND ENVIRONMENTAL SUSTAINABILITY.

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Annotation: in the 21st century, architecture has undergone significant changes. They are aimed at ensuring environmental sustainability, innovative technologies and harmonious coexistence of man with the natural environment. Today, architecture is not only limited to creating aesthetically attractive buildings, but also focuses on minimizing its impact on the environment. Modern technologies and innovative solutions allow architects to design energy efficient, ecological and comfortable living spaces.

Keyword: environmental sustainability, building, ecology, modern, electric energy, architecture, resources, transportation.

Principles of environmental sustainability role in architecture

Environmentally sustainable architecture is based on the following important principles:

1. Energy efficiency-reducing energy consumption through the use of modern materials, thermal insulation, solar panels and wind turbines.
2. Rational use of resources is the use of recycled and local building materials, which reduces CO₂ emissions and transportation costs.
3. Green technologies are the integration of green roofs, vertical gardens, rainwater harvesting systems and energy – efficient windows.
4. Smart technologies are automated building management systems (intelligent lighting, ventilation, heating) that reduce electricity and water consumption.
5. Bioclimatic design is the design of buildings taking into account climatic conditions, which makes it possible to create a favorable microclimate, taking maximum advantage of natural conditions.
6. Harmony with the natural landscape – to carry out construction and revitalize the urban environment, while maintaining natural landscapes.
7. Carbon footprint reduction is the use of low carbon materials and waste recycling in the construction process.
8. Multifunctional living areas are the efficient use of resources by harmonizing living, working and resting places in urban environments.





9. Green energy is the widespread introduction of alternative sources of electricity through the use of solar panels, wind generators and geothermal energy sources.

Examples of environmentally sustainable buildings

Many innovative and environmentally sustainable projects are being implemented around the world. The following are several notable projects: - The Edge (Netherlands) is one of the most energy efficient office buildings in the world, famous for its smart technology and solar panels. – Bosco Verticale (Italian: Bosco Verticale) is a complex of living towers located in Milan, covered with trees and plants, which reduces the level of air pollution. – One Central Park (Australia) - characterized by Integrated Green systems and built-in mirrors for natural orientation of sunlight to the lower floors. - Masdar City (UAE) is a fully environmentally sustainable urban project built on the basis of solar energy and natural ventilation systems. – The Crystal (UK) is a sustainable development centre with renewable energy and rainwater harvesting systems. - Singapore Gardens by the Bay (Singapore) is a project built in harmony with the environment using artificial climate gardens and modern technologies. - Eden Project (UK) is a large green complex created for Biodiversity Conservation and Natural Environment Research.

Architecture of the future: new paradigms

The architecture of the future will take environmental sustainability to a higher level. New buildings will not only be energy efficient, but also help to restore natural resources and protect the environment. At the same time, the following principles take priority: - Striving for carbon neutrality-buildings will be equipped with new technologies to reduce carbon emissions to zero degrees. - New biomaterials-the use of natural and renewable materials to improve living conditions and reduce environmental impact. - Intelligent climate control-buildings automatically optimize energy consumption, adapting to external conditions.

Conclusion: modern architecture is developing based on the principles of environmental sustainability. With the help of new innovative solutions and smart technologies, buildings not only create a comfortable living environment for humans, but also serve to optimize the use of Natural Resources. In the future, architecture will further develop on the principles of energy efficiency, environmental harmony and technological development. This makes it possible to provide a comfortable and stable living environment not only for today, but also for future generations.

