

Energy Saving Architecture: Engineering and Climate Change

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Nowadays scientists pay special attention to the fact that all engineering tasks should be set and solved from the standpoint of combating climate change by reducing greenhouse gas emissions. The proposed and used materials and technologies should have a low carbon footprint and comply with the principles of developing a green economy.

All buildings, in all climatic regions, emit CO₂. This is because buildings use energy for lighting, water supply, heating, cooling, ventilation, appliances, and technological processes. For these purposes, it is advantageous to use clean renewable energy. The building is always in interaction with renewable energy, including incoming solar radiation and the environment surrounding the building [1]. Thus, the environment has the thermal potential of the outdoor air, soil, wind, sky, and surfaces facing the building [1, 2]. By ensuring the expedient daily and seasonal interaction of these energies with the building, it is possible to create a comfortable, stable, and economical internal microclimate. For example, energy consumption for heating, cooling, and ventilation can be reduced.

From the position of year-round and daily energy savings and ensuring internal comfort, the author proposed the theory and practice of energy-saving architecture [1]. This architecture allows you to choose the appropriate volume, shape, orientation, size, and location of both the building and its enclosures, especially windows, and doors. In this way, it is possible to achieve: passive solar heating through the windows on the southern facade, skillful placement and shading of windows, and improvement of the energy efficiency of outdoor enclosures. In a sharply continental climate and a significant thermal mass of the rooms, it is possible to abandon the air conditioner due to night cooling by airing the rooms with a cool breeze.

The theory and examples of energy-saving architecture are helpful not only for architects, designers, builders, and energy specialists but also for people who use buildings. The author calls on all people, including readers and authors of the journal, to carry out their activities and actions from the position of climate change mitigation and adaptation to it. Everyone should contribute their own impact to solving this global problem and protecting our planet.

References

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