

Effect of using greenhouses instead of balconies on energy conservation in buildings.

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Abstract– Growing energy demands with an increasing population have reiterated the importance of energy conservation. Buildings share a large portion of energy use worldwide. Energy efficient building technologies help to maximize solar heat gain in winter, minimize it in summer and optimize energy requirements in buildings. In present paper, effect of existing balconies in several stories buildings on indoor heat losses in the cold winter through infiltration and thermal bridges will be analyzed experimentally in a real existing case study in Tehran, and then the results will be compared with the same building simulated in the software considering separated greenhouses instead of those balconies and analyzing the effect of using this strategy on energy saving in the building sector in the cold winter climate in Tehran. The results shows the southern greenhouses will play a significant role, not only in preventing energy losses but also a large amount of energy conservation in building, and the other faced greenhouses may effect on energy saving not as much as the southern ones, but the results of computational analysis will prove that they can be very useful for reducing energy losses through those unprotected balconies. Of course, these greenhouses could help to lower indoor air temperature during summer by natural ventilation through their complete sliding surfaces and converting them to open spaces balconies, As the simulation results will help better discussing this reality. Combined effect of well-considered energy efficient building technologies is thus useful for energy conservation and also summer cooling in buildings.

ABSTRACT: Energy conservation, Greenhouse, Energy losses, Energy Analyzing, Simulation, Balcony