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Accommodating Thermal Features of Commercial Building Systems to Mitigate Energy Consumption in Florida due to Global Climate Change

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## **Accommodating Thermal Features of Commercial Building Systems to Mitigate Energy Consumption in Florida due to Global Climate Change**

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Space cooling plays a major role in the commercial building energy consumption due to hot and humid climate in Florida. Although many studies have found that global warming would cause a decrease in heating requirements and an increase in cooling requirements, few of the studies propose mitigation of the cooling demands of the buildings. This study explores the mitigation measures, which include the thermal resistance features of wall and roof systems, visible and solar transmittance values of glazing material, thermal conductivity of windows, and set point temperatures of commercial buildings in Florida. The cooling demands are simulated by using the projected climate weather data in the periods between 2020 to 2100 in different cities. The cooling demands are reduced at various rates between 1% and 5% in all studied building types and in all climate zones by changing the thermal resistances of roofing systems from R-12/14/16 to R-19/21 and wall systems from R-13 to R-19/21. Increasing the wall thermal resistance features is more efficient in mitigating the cooling demands of buildings than increasing the thermal resistance features of roofing systems. In addition, the average values of visible transmittance and solar transmittance of glazing materials and thermal conductivity of windows for a high-rise apartment are suggested to be 0.3, 0.2 and 0.3 respectively.

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