Abstract

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Sustainability of Higher Educational Buildings Retrofitting Measures to Enhance Energy Performance – The Case Study of AASTMT Business Management School Building, Egypt.

Buildings compose the highest portion of global CO2 emissions from different sectors (approximately 5.5 Gt CO2-eq.). According to the Intergovernmental Panel on Climate Change, Egypt is among those nations that will be heavily affected by the impact of climate change, even though its greenhouse gas (GHG) emissions represent only 1% of the world's GHG emissions. Electricity consumption in public buildings, including administrative, educational, and healthcare related buildings, is 9% – the second largest category after residential buildings at 40%. Enhancing energy performance in higher education and residential buildings will have a significant impact on the reduction of electrical energy consumption, resource efficiency, and the nation's energy footprint. Energy consumption in educational buildings depends on activities, time of use, and influx of visitors, students, and academic staff, as well as the academic term, that is, winter summer. Retrofitting measures are important for reducing energy consumption in higher educational buildings and cooling requirements in a hot climate. The most important measures in the retrofitting process of the building envelope, including its roof, are mainly the glazing type and characteristics and the thermal insulation of walls. This chapter focuses on sustainability measures of the Business Management School building at the Arab Academy of Science, Technology & Maritime Transport campus in Cairo, Egypt. The objective is to set a baseline assessment of the building's energy use and compare it with energy performance after retrofitting