

# Abstract

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## **Evaluation of an Existing Building to be oriented towards a Green Building: A Case Study**

Major challenges are encountering mankind these days, one of which is the lack of nonrenewable resources which imposes a need to implement creative solutions to fulfill the daily basic needs and provide a maximum possible reserve for future generations. With the continued challenge of climate change, more countries are implementing measures that will reduce energy consumption and GHG emissions. The Arab Academy for science and technology and Maritime transportation, Cairo branch buildings (A, B, and GS) were used as a case study. The research has focused on detecting seven tiers to retrofit those buildings to be environmentally green. Those tiers include energy consumption, water and waste water quality, operating cost, application of 3R, health and productivity impacts, occupants comfort, and greenhouse gas emissions. Data were collected and analyzed for the three buildings to find answers for the research questions under the market transformation theory framework and the policy oriented research. The results and analyses showed that it is possible to reduce energy consumption by about 29%. This will result in reducing operating cost by 227,877 LE/year and the GHG emissions by 28.97%. The application of 3R strategies would reduce the operating cost by reducing the waste produced, reusing the materials, and recycling it. Using the sokaway system as a solution to reuse the waste water to irrigate plants and the adoption of the suggested practices for water management inside the AASTMT buildings will result in reduction in water consumption which will reduce the demand on the natural resources. The application of Green building practices and recommendations inside the buildings will enhance the productivity of the employees and the building users and will improve their welfare which will result in a greater financial benefit for the organization and the surrounding environment as well.