ENERGY CONSUMPTION PATTERN ANALYSIS OF YUSUF MAITAMA SULE UNIVERSITY CITY CAMPUS, KANO

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ABSTRACT

This dissertation explains the walk through energy audit conducted for Yusuf Maitama Sule University City Campus (Ado Bayero House). The average annual consumptions of electricity and diesel were found to be 125,375kWh & 93947.375litres (1,007,115.86kWh) respectively. Energy consumption of the energy end users revealed that ventilation and air conditioning had the highest average energy consumption of 48.59%, followed by electrical appliances 30.67%, lighting 18.3%, lift 1.3% and laboratory equipment 1.08%. The productive energy use index for the university is 430.64kWh/student/year. The building energy intensity for the whole University was computed as 105.89kWh/m^2/yr. The average correlation coefficient value (R^2) for the four years is 0.5 indicating a fair correlation between electricity use and cooling degree days. To improve the electrical energy performance in the university, an enhanced level of awareness to reduce energy waste, the use of efficient equipment and control system is found to be the most effective energy efficiency strategy to improve the lighting and air conditioning system efficiency. From the research, retrofitting all lighting fittings to LED will result in an annual saving in energy by 12.2% and payback period of 2.9years.The re-scheduling of light from 12hours to 6hours will provide an annual energy consumption saving of 9.15%.Reducing air conditioning operating hours from 10hours to 5hours will reduce the total annual energy consumption by 19.3%. Energy conservation measures (ECMs) followed in this research had shown significant savings in terms of both energy and cost, if well implemented, can pave the way for a sustainable future towards energy management in the university.