



THE ENERGY PERFORMANCE OF HOSPITAL BUILDINGS IN NIGERIA

S. C. Nwanya

*University of Nigeria
410001 Nsukka – Nigeria*

O. V. Ekechukwu

*National Universities Commission
Abuja – Nigeria*

ABSTRACT

The negative effects of deteriorated indoor environments have been recognised in Nigerian hospitals. This paper presents a summary of how Nigerian hospitals prioritize their energy supply under alternative sources of power. It also, suggests ventilation strategies that enhance indoor environmental quality and reduce energy use. The specific objectives of the study include estimating how much of the total energy requirements are used in patient rooms, calculating metrics for assessing energy performance and estimating emission reductions achieved through renewable energy systems in hospitals. The research used a systematic field survey followed by in-depth statistical analysis. The field survey investigated four categories of hospitals, namely rural, urban, specialist and teaching hospitals; medical equipment; ventilation facilities in addition to patient population, lighting points, and manpower requirements. Then, questionnaires were administered randomly among 70 hospitals in Nigeria. Results of the analysis show that stand-alone auto-generation is predominantly used in all the hospitals, when grid utility supply is unavailable or unreliable. Although, auto-generation presents attractive solutions, it is restrictive to emergency usage. Emergency usage is insensitive to microclimatic changes at the detriment of in-patients. For more efficient lighting, the 57.73 % utilization of tungsten bulbs in patient rooms is reduced through application of photovoltaic (PV) system. Based on a sensitivity analysis, it is shown that photovoltaic system has potential economic viability comparable to conventional sources. The paper concludes that cost-effective energy supply will add to the value of hospital service delivery in Nigeria, where expenditure on healthcare is less than 5 % of the Gross Domestic Product (GDP).

Keywords: energy performance, efficiency, hospital, building