

## Energy performance indices for hospital buildings in Nigeria

S.C. Nwanya, author

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### Abstrak

In Nigeria, the economic problem of allocating energy to medicare have long been a major concern and standardized indices to be used as guidance are non-existent. This paper determines energy indices for assessment of how Nigerian hospitals prioritize their energy utilization. Systematic field surveys followed by in-depth statistical analysis were adopted. The hospitals were stratified into four categories for the investigation. Then, questionnaires were designed, randomly administered and their responses generated in conversation with workers at 70 hospitals in Nigeria. Results of the analysis show that an average hospital in Nigeria, depending on its category, uses energy as follows: rural 66.936kWh/day; urban 343.23 kWh/day; specialist 454.872 kWh/day and teaching 1,944.394 kWh/day. Lighting is shown as a critical energy function and accounts for as much as 15%, 36%, 40.5% and 69.5% of daily energy use in rural, urban, specialist and teaching hospitals, respectively. A productivity based energy performance indicator for each hospital category works out to be 3.346 kWh/bed space/day, 2.367 kWh/bed space/day, 4.548 kWh/bed space/day and 19.443 kWh/bed space/day, respectively, for typical rural, urban, specialist and teaching hospitals. The respective Building Energy Index (BEI) values for the categories of hospitals are as follows: rural 0.13 kWh/m<sup>2</sup>/day; urban 0.077 kWh/m<sup>2</sup>/day; specialist 0.088 kWh/m<sup>2</sup>/day and teaching 0.277 kWh/m<sup>2</sup>/day. The low BEI implies that the buildings have lower rates of sick building syndrome symptoms. Also, auto-generation is predominantly used in all the hospitals, when grid utility supply is unavailable.