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Data Article

Smart campus: Data on energy consumption in an ICT-driven university

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ABSTRACT

In this data article, we present a comprehensive dataset on electrical energy consumption in a university that is practically driven by Information and Communication Technologies (ICTs). The total amount of electricity consumed at Covenant University, Ota, Nigeria was measured, monitored, and recorded on daily basis for a period of 12 consecutive months (January–December, 2016). Energy readings were observed from the digital energy meter (EDMI Mk10E) located at the distribution substation that supplies electricity to the university community. The complete energy data are clearly presented in tables and graphs for relevant utility and potential reuse. Also, descriptive first-order statistical analyses of the energy data are provided in this data article. For each month, the histogram distribution and time series plot of the monthly energy consumption data are analyzed to show insightful trends of energy consumption in the university. Furthermore, data on the significant differences in the means of daily energy consumption are made available as obtained from one-way Analysis of Variance (ANOVA) and multiple comparison post-hoc tests. The information provided in this data article will foster research development in the areas of energy efficiency, planning, policy formulation, and management towards the realization of smart campuses.

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Specifications Table

Subject area	*Engineering*
More specific subject area	*Electrical/Power Engineering*
Type of data	*Tables, graphs, figures, and spreadsheet file*
How data was acquired	*Daily energy data were obtained from the Liquid Crystal Display (LCD) of the Digital Energy Meter (EDMI Mk10E) located at the distribution substation that supplies electricity to Covenant University, Ota, Nigeria.*
Data format	*Raw, analyzed*
Experimental factors	*Data monitoring and logging were performed manually i.e. the recording process was not automated*
Experimental features	*Statistical analyses of the monthly data were performed to show the trends of energy consumption in an ICT-driven university community*
Data source location	*The energy data provided in this article were collected at Covenant University, Canaanland, Ota, Nigeria (Latitude 6.6718°N, Longitude 3.1581°E)*
Data accessibility	*A comprehensive energy consumption dataset is provided in this article*

Value of the data

- Free accessibility to energy consumption data of an ICT-driven university will encourage more evidence-based (empirical) research for better understanding of electricity consumption pattern and improvement in energy consumption efficiency [1–3].
- Researchers, engineers, and industry experts will find the data provided in this article useful for energy consumption model development, energy audit, load forecasting, and energy management [4–6].
- Statistical analyses of the electrical load demands will assist energy policy makers and university management in proper energy audit, planning, budgeting, and decision-making [7].
- Public availability of these energy data is considered valuable to the timely actualization of smart campuses as it relates to sustainable development [8–10].

1. Data

ICTs enable global interconnectedness that is required for the delivery of quality education [11]. However, ICTs require functional supplies of electrical energy to operate. As a matter of fact, universities of the 21st century are practically driven by ICTs [11]. Therefore, the electrical load demands of facilities and services within the university community must be satisfactorily met to guarantee sustainable education. The data that are made publicly available in this article contain useful information about the electrical energy consumption in an ICT-driven university community. The total amount of electricity consumed at Covenant University, Ota, Nigeria was measured, monitored, and recorded on daily basis for a period of 12 consecutive months (January–December, 2016).

Table 1 presents the daily energy consumption readings at Covenant University from January to December 2016. These data can be explored to gain useful insights about the load demands of the university community across all weather seasons. In addition, descriptive first-order statistics are presented in Table 2 to explain the data distribution of the electricity consumption. Figs. 1–3 show the trends of energy consumption for each month in 2016. The graphs were plotted using MATLAB 2017b computational software. Histogram plots of the monthly energy data are illustrated in Figs. 4–6 to show the statistical distribution of the data. Proper interpretations and discussions of these plots will give useful insights that are needed for valid conclusions.

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