Chapter 3

Smart Homes and Sustainable Energy in Nigeria

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ABSTRACT

In many developing countries, there is limited access to electricity with the populace typically resorting to purchasing personal electricity generating units. This research explores the factors affecting the possibility of introducing smart homes that would conserve electricity, reduce a need for reliance on the national grid and lower energy costs. Advantages and disadvantages, as well as the impact on society and development in general are examined in addition to future perspectives on smart homes and sustainable energy.

INTRODUCTION

While sustainable energy has been researched and applied in developed countries with stable access to electricity, there has been limited research into such possibilities in the developing world in general and Africa in particular. A case can be made for the need of such innovation as access to power is limited and in many situations, unaffordable for the average person living in certain parts of the continent.

Many developing countries struggle with the generation and supply of power. Nigeria is one of such countries beleaguered with poor power supply and limited
access as currently, about 48% of Nigerians have access to electricity (World Bank, 2015). The country’s population stands at approximately 160 million (United Nations, 2012) with a peak electricity output of over 4,000MW and per capita consumption just 3 per cent that of South Africa (Financial Times, 2012), one can conclude that this is insufficient to support the power needs of the growing and developing population. Subsequently, there are frequent power outages as a result of the limited supply. According to the Financial Times (2012), despite having large reserves of natural gas that can fire thermal plants, Nigeria’s electricity supply and service is among the world’s worst, with half of the population lacking access to the grid.

In addition to the limited supply available to many Nigerians, disposable income is also a problem that may hinder access to electricity. According to the Central Intelligence Agency (2009) in comparison to the rest of the world, 70% of Nigerians live below the poverty line. Higher income earners also have to deal with rising costs of energy costs for cooling and ventilation and an increasing amount of energy consuming appliances such as white goods and consumer electronic devices, which means that hidden saving potentials can be found in numerous areas of a modern smart home (Kolfer & Kastner, 2010). Furthermore, many sectors have responded to the need to reduce their levels of energy consumptions. However, in residential homes, sustainability is a relatively new phenomenon as there is a lack of sufficient technological advice for home owners (Reinisch, Kofler, Iglesias & Kastner, 2011). As a result of the aforementioned challenges, this chapter aims to propose a framework that will identify factors affecting the adoption of smart home from the perspectives of different parties. This would allow for the exploration of the degree of openness towards adopting smart home technology enabling home owners to reduce their energy consumption, reduce a need for reliance on the national grid and lower energy costs. The chapter is structured as follows. This section introduces the research while the next session provides a background to the research area. The main focus of the chapter is discussed next, followed by the issues and recommendations arising. The future research directions are then discussed followed eventually by the conclusion.

**SUSTAINABILITY AND SMART HOMES**

Omer (2007) argues that the energy sector is encountering difficulties because increased production and consumption levels cause higher levels of pollution and in due course, climate change with possibly disastrous consequences. This implies that an alternative to excessive consumption must be sought to avoid such consequences. As a result, sustainable energy is a phenomenon that any country cannot
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