

**GREEN ENERGY STRATEGIES AND UNITED NATIONS
SUSTAINABLE DEVELOPMENT GOAL ON AFFORDABLE CLEAN
ENERGY AT KENYA ELECTRICITY GENERATING COMPANY
LIMITED**

**BY
HONNON SAMUEL KOSGEY**

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DECLARATION

This research project is my original work and has not been presented for the award of degree in any other university or institution for any other purpose.

Signature Date

Honnon Samuel Kosgey

D61/84071/2015

This research project has been submitted for examination with my approval as university Supervisor.

Signature Date

Dr. Mary Kinoti,

Senior Lecture, Department of Business Administration,

School of Business,

University of Nairobi

DEDICATION

I dedicate this project to my loving parents whose words of encouragement were invaluable in the completion of this program due to their understanding and support.

I also dedicate this work and with special thanks to my siblings for their devout support and prayers throughout the process. I will always appreciate their courage and love.

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LIST OF ABBREVIATIONS

ERB:	Electricity Regulatory Board.
FiT:	Feed- in Tariff.
GOK:	Government of Kenya.
IMF:	International Monetary Fund
IPPA:	Interim Power Purchase Agreement
IPO:	Initial Public Offering.
KenGen:	Kenya Electricity Generating Company.
KPC:	Kenya Pipeline Company.
KPLC:	Kenya Power and Lighting Company.
KPRL:	Kenya Petroleum Refineries Limited
NOCK:	National Oil Corporation of Kenya.
NEP:	National Energy Policy
NSE:	Nairobi Security Exchange
SDG	Social Development Goal
UNSDG	United Nations Social Development Goal
USTDA:	United States Trade and Development Agency
WB:	World Bank

ABSTRACT

The strong forces arising from the dynamic environment has made organizations in today's world to re-think on how to do business in order to fully satisfy their stakeholders and remain relevant in the unfolding dispensation. In any given business environment, innovative adoption strategy has to be employed to provide tactical mode that satisfy the customers. Different organizations will have different ways of achieving their competitive advantage similarly different strategies have been implemented in the organization in order to achieve competitive advantage in the firm. Despite these attempts by researchers to investigate on the green energy aspect in Kenya, none of the studies known to the researcher has been done on investigating the effects of the green energy strategies and sustainable development goal on the achievement of affordable clean energy in Kenya. The purpose of this was to establish the effects of green energy strategies and united nations sustainable development goal on affordable clean energy in Kenya; A case study of Kenya Electricity Generating Company Limited (KenGen). The researcher adopted a case study design with a census Population of 10 respondents comprising of the Chief Executive Officer and 9 Executive Directors who forms the executive board committee at KenGen. The researcher collected primary data using interview guide. The findings of the study indicated that green energy strategies are adopted for the provisions of affordable clean green energy for the organization. The Kenya electricity generating company considers green energy strategies to be valuable tools as they help in attaining the strategic goals while ensuring the energy is affordable, reliable and sustainable to the consumers. Therefore, the study concluded that green energy strategies have a significant impact on the affordability of the clean green energy. In order to make the green energy affordable, emphasize on the rules and regulations concerning the green energy strategies should be adhered to. The policies and regulated standards will enhance full adoption of the green energy strategies in the organization and thus, ensures all employees and managements are focused on the sustainable development goal of green energy and the affordability. The study recommends that the organization should increase the investment in training employees on the green energy strategies for it is a good way to enhance the adoption of the green energy strategies and their operationalization. The strategic planning should also be incorporated in these strategies for it will ensure that the strategies are achieved and will allow creativity and innovation to the strategies hence, facilitate the achievement for the affordability of clean green energy.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The strong forces arising from the dynamic environment has made organizations in today's world to re-think on how to do business in order to fully satisfy their stakeholders and remain relevant in the unfolding dispensations. These conceptual not only changes present critical challenges but also new opportunities for growth and development (Ojo, 2009). Therefore, organizations are rapidly adopting new strategies to respond to this dynamic environmental pressure in order to remain relevant economically. There is a new paradigm on the organization to emphasize on the environment preservation thus aligning the firms' strategies in order to be sustainable in the business environment. Green energy strategies have been on alert by the power generating firms globally in order to provide an eco-friendly product to the customers.

The study is anchored towards the resource based view theory of a firm and stakeholders' theory. The resource based theory of the firm was developed by Hart (1995) that recognizes that in order for the firm to be sustainable in the business environment and to improve the overall performance of the firm, it should possess non-substitutable, valuable and rare resources which are in a form of processes, knowledge, skills, assets, capabilities and firms' attributes (Daft, 2001). The stakeholders' theory, which was developed by Freeman (1984), recognizes that need to incorporate the socio corporate responsibilities in order to enhance the sustainability of the operation in the environment.

It emphasizes on the incorporation of stakeholders' interest in the processes of the organization that entails the issues of regulatory compliance of the environmental sustainability (Elias, Cavan & Jackson, 2000). The research is also anchored towards open systems approach theory that was developed by Burnes, (2000), that suggests that organizations operate in open systems where there is an interaction between internal and external environment. The theory recognizes the essential element of recognizing the environment in order to enhance the sustainability of the green energy sector.

In Kenya, the Electricity Generating Company Limited, (KenGen), is the leading power generating company and the main supplier of electric power to KPLC through the national grid. The growth has been due to a high pressure by the industrial and domestic power consumers. The organization has adopted diversification due to the technological change pressure from Non-green energy to Green energy that is more affordable, reliable, sustainable and environmental friendly. Consumer's products are much safer from power surge than with Non green power. These developments coupled with lack of the literature on the effects of green energy strategies on the achievement of affordable and clean energy triggered the need for a study which motivated this research undertaking (Kiara, 2013)

1.1.1 The Concept of Strategy

Strategy has no one agreeable definition, for it means differently to different people, although scholars and authors have defined strategy differently from one context to other (Mintzberg *al*, 1999). However, according to Quinn (1980), the term strategy refers to as

the definite approach or plan chosen by a firm to enhance organizational goals and objectives.

The strategy of the organization it puts into consideration the policies, action, goals and objectives into one platform, for the formulation of the firms' strategy enables the firms to utilize its resources efficiently while satisfying the customers. According to Johnson & Whittington (2008), recognized that organization usually configure their firms' resources and capabilities in order to fulfill the expectations of their stakeholders in a manner that it will benefit both the customers and the firm.

Strategy is a major instrument that is employed by the senior managers in an organization in shaping and determining the future direction of the organization. They give its role as being threefold; to identify the sustainability of the firm in a dynamic environment, and to be able to recognize some of the ways in which the organization will implement in order to achieve the firms' objectives while satisfying the customers. Strategy distinguishes what does matter from what does not matter and that the secret of effectiveness is to know what really counts than to do what really counts by not worry about the others. Friction is largely reduced when what is important is identified from what is not important.

Strategy emphasizes on defining the purpose and the means by which an organization can achieve its goals and its objectives. It enhances the achievement of the organization success. It concurs with old age that says: "Failure to plan is planning to fail" He further suggests that the purpose of the firm with its emphasize on the policies, objectives and goals should be in a way that defines the organization strategy (Newman *et al*, 1989).

1.1.2 The Green Energy Strategy

Green energy strategy refers to a definite plan which entails the use of environmental friendly sources of energy and power which must be renewable and non-polluting (Orsato, 2006). According to UN, 2015 report on SDG (7), Green energy strategy is geared towards enabling nations to attain a higher economic growth rate through creation of affordable, reliable, sustainable and modern energy for all. Through this affords, Kenya has adopted a green energy strategy and implementation plan 2016-2030 on low carbon, resource efficient, equitable and inclusive socio-economic transformation to enable it attain a higher economic growth rate consistent to vision 2030.

Green energy usually emanates from the natural sources such as wind, sunlight, water, biogas, coal, geothermal heat (earth heat) among others. These sources of the green energy are renewable and as results, they are naturally replenished. The green source of energy is different from fossil fuels which tend to diminish in use and takes millions of years to develop. Green energy is a subset of the wider spectrum of the renewable energy sources and acts as a proxy for the renewable energy resources and technologies which offer a huge benefit to the environment by minimizing pollution that is associated with other sources of fuels like fossil fuels. The need to protect the environment and reduce excessive carbon emission into the air and its reliable to consumers has led to the adoption of green energy as a strategy. There are various sources of the green energy for instance: geothermal power, wind power, solar power, hydropower among others (Renewable Energy Act, 2005).

The green energy sources provide electric power by providing technologies which generate the electric power without depleting the environment. These sources are usually

managed to ensure they are sustainable in an eco-friendly manner. By exploiting the energy sources, it makes the generating firm to provide the energy to the shareholders at an affordable price. Green energy through the exploitation of the eco-friendly sources, it has led to expansion of the customer base of the transmission of the electric power that includes the remote areas. The advancement of the energy technologies has led to lowering of the cost of renewable energy and other sources of green energy, which makes it prudent in making the green energy affordable to various stakeholders (REA, 2017)

1.1.3 Energy Sector

The energy sector is essential in the development of the economy in Kenya (Institute of Economic Affairs, 2015). The energy sector is under the Ministry of Energy and Petroleum whose main task is the formulation and implementation of efficient policies that govern the utilization of energy and petroleum in the nation. Through the support of UNSDG policies, the energy sector produces a conducive environment for its stakeholders that gears towards overall national growth strategy. Its main work are formulation and planning for the national energy and petroleum, high trainings of work force to utilize and maximize available resources, and mobilization of the financial resources at its disposal (Ministry of Energy and Petroleum, 2013). The ministry manages the implementations of policy directions through the national energy plan. The ministry is a traditional organization with electricity and petroleum being the dominating subsectors within it (Kant, Masiga & Veenstra, 2014).

The energy sector has five main tasks that include: Planning the Energy Sector Policy, vision and mission strategic direction, design a least cost power blue print plan;

undertaking geological, geophysical and geochemical mapping for geo-energy minerals; promoting development of renewable energy; energy efficiency and conservation and lastly exploring, appraising and developing petroleum resources. The energy sector is mandated mainly for the provision of energy to its potential consumers, and the management of some downstream processes. The energy sector serves a critical role in fostering the socio-economic dimension of Kenya because they form the main drivers of the economy (Ministry of Energy & Petroleum, 2015).

1.1.4 Kenya Electricity Generating Company Limited

Kenya adopts the SDG on energy strategy through KenGen to enable for affordable, reliable, sustainable and sufficient energy. KenGen, is a leading limited company in generation of electric power in Kenya with about 80 percent of electricity that is used in currently in the country. The company was incorporated on 1st February 1954 as Kenya Power Company (KPC) and was later named KenGen following implementation of reform in energy sector. The company's main business is developing, managing and operating power generating plants that supply electric power to the Kenyan market and targeting Eastern Africa region in a near future. KenGen is faced by various constraints, including climate change and high operation cost for their plants in isolated areas. Due to this constraints government of Kenya through the ministry of energy intervened and issued an Initial Public Offer (IPO) onto the Nairobi Stock Exchange (NSE) under the session paper no. 4 of 2004 on energy, where it issued 30 percent of its stake as a strategy of reducing those constraints. As at 30th June 2015, the Company had a total installed capacity of 1.337 MW comprising of hydropower, geothermal, thermal Power, Wind and Solar Energies, (Kiara, 2012).

KenGen has a long term objective of developing more explored wells to ensure all citizens and industries have access to reliable, eco-friendly and competitively priced power energy. These will help in enhancing the living standards of all Kenyans in general with Water and Sanitation, Education and Environmental Conservation, sporting activities, peace building & culture and provision of health care (GoK, 2004). There is a formal Interim Power Purchase Agreement, (IPPA), between KenGen and KPLC that gives details on trading and tariff arrangement regulated under Electricity Regulatory Board (ERB). The preliminary tariff study report recommends a plant specific two-tier tariff structure comprising of capacity and energy charge for KenGen plants. The capacity charge will recover all capital related costs (repayment of foreign and local loans, return on equity, taxes and duties) based on target availability and a contracted capacity of the plant (World Bank, 2004).

1.2 Research Problem

In any given business environment, innovative adoption strategy has to be employed to provide tactical mode that satisfy the customers. Changing from non-green energy to Green energy is a positively registered change in strategy adoption and implementation, (Coyle *et al* 2003). Growth may bring new business opportunities and larger market size while credibility leads to a higher value regarded as a motive for organization growth (Njeru, 2013). Different organizations will have different ways of achieving their competitive advantage similarly different strategies have been implemented in the organization in order to achieve competitive advantage in the firm (Mintzberg, 1991; Johnson & Scholes, 1993).

Various studies have been conducted in this area globally and locally. Globally, Woh, & K Lee (2004), studied the causal association between consumption of energy and the growth of the economic activities as measured by either income or employment. There is a positive relationship between energy consumption and income, economic growth and policies and concluded that the consumption of energy has a link with the growth in the economic activities Baumers *et al* (2010), studied on the effect of capacity utilization on renewable green energy efficiency that varies across different sectors. Santosh (2009) carried out experimental studies in Indian manufacturing industries that established a positive correlation between the size of the firm and efficiency of the renewable energy.

Locally, Kiara (2013) did a research study on the infrastructure development determinants on the renewable energy sector: a case study of Kenya Electricity Generating Company Limited (KenGen), the study findings established that KenGen's organizational culture supports implementation of renewable energy development projects, which has contributed in the enhancement of the green energy in the company. Omamo (2012) carried out a research study on the factors affecting adoption of green technology by firms in Kenya and concluded that technological and environmental factors among other factors negatively influences the number of firms wishing to adopt green technology. Gitone (2014) did a research study investigating the determinants of adoption of renewable energy in Kenya and established that household size plays a role in facilitating the adoption of the green energy in Kenya. Despite these attempts by research to investigate on the green energy aspect in Kenya, none of the studies known to the researcher has been done investigating the effects of the green energy strategies on the achievement of the clean energy in Kenya. This has created the need for a further study

by addressing the following research question: what are the impacts of green energy strategies on the achievement of the affordable and clean energy in Kenya?

1.3 Research Objective

To establish the effects of green energy strategies and the sustainable development goal on affordable clean energy in Kenya, A case study of Kenya Electricity Generating Company Limited (KenGen).

1.4 Value of the Study

The study will be of essential to the government and other policy makers in coming up with policies and regulations on how best to regulate the green energy sector in Kenya by providing information on effects of green energy strategies on the achievement of the affordable clean energy in Kenya thereby contributing to the achievement of Kenya's Vision 2030 and fulfillment of the Sustainable Development Goal, agenda 7.

The findings from this study will help top management of KenGen and other energy firms by helping them to understand the importance of the green energy strategies on the achievement of clean energy in Kenya. It will also help them deal with environmental conservation issues that are enlightened on the need to adopt greener energy for conservation and protection of the environment from pollution that emanates from the traditional sources of fuel such as burning of fossils and petroleum products. The research study will help researchers and future scholars with rich body of knowledge, which they can use to identify research gaps for further improvements. The research study will also satisfy their information needs by providing them with literature on the effects of green energy strategies and SDG on the achievement of the affordable clean energy in Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter entails literature as studied by various researchers and scholars in the concept of green energy strategies on affordable clean energy. The chapter will also provide the theoretical perspective and empirical literature on the study.

2.2 Theoretical Framework

The study is anchored towards the resource based theory, stakeholders' theory and the open system theory that show case the functions of the resources in the organization that are identifiable to a certain firm in order to explain the sustainability among other firms and use of modern instruments in the management of the organization operations such as ethics, morals and community consideration in the management respectively. The various stakeholders include the local community, employees, managers, shareholders, customers, suppliers' environment groups and competitors among others.

2.2.1 Resource Based View Theory

The resource based view of the firm was developed by Hart (1995), in which the theory emphasizes on the need of the firm to be realized by having unique resources that are rare, non-substitutable, valuable and non-imitable. He recognizes that these resources enable the firm to harness the opportunities and minimizes the threats in the environment especially those resources that not posed by any other company making the organization to have a competitive advantage over other firms. Resources are in a form of skills, processes, knowledge, information, capabilities and firms' attributes (Daft, 2001).

According to Helfat & Peteraf (2003) argued that for firms to be sustainable in the environment, it should adopt the rare resources that are adaptable in the dynamic environment, in which he recognized that the knowledge is most resourceful intangible assets that a firm need to enhance sustainability in the dynamic environment. (Mentzer, Min & Bobbitt, 2004). This theory is essential for the researcher for it recognizes organizational knowledge sharing, processes and close working relationships as the resources used to enhance sustainable development of green energy strategies that eventually lead to affordable clean energy.

2.2.2 Stakeholder Theory

The theory emphasizes on the socio corporate responsibilities as an essential factor above the usual objective of profitability and other operation efficiency goals. The theory recognizes that the stakeholders are individuals and groups who are directly affected by the operations of the organization (Freeman, 1984). The need to incorporate the stakeholders' interest and will in the organization is more essential than just regulatory compliance; therefore, just considering the stakeholders is not always the ideal way of conducting business from a financial point of view (Elias, Cavan & Jackson, 2000). The local community, competitors, customers, environmentalists, employees and government are the stakeholders in the organization who affects the operations of the organization. The theory emphasizes on the need to fulfill the stakeholders' obligations and ensuring that they are well informed and incorporated in the operations of the firm, failure in which it will lead to negative effect in the operations of the firm.

Freeman elaborated that the stakeholders hold a critical position in the operations of the organization, in that they the power to influence the activities of the organization.

According to Henriques & Sadosky (1999), the stakeholders have certain expectations from the organization in terms of the consideration of the environment and sustainability. The organization need to make strategic decisions considering the impact to the stakeholders. The theory is essential to the study for the green energy strategies affects virtually all the stakeholders of the firm and therefore the sustainable development goals, which will eventually enhance affordability of the clean energy.

2.2.3 Open Systems Approach Theory

Open Systems approach theory was developed by Burnes (2000), the theory suggests that organizations operate in open systems where there is an interaction between internal and external environment. Most often, organizations transact with the environment by obtaining their inputs from the environment, processing them to goods and/or services and getting their output to the environment (Bastedo, 2004). This indicates that organizations cannot exist without the external environment which explains organizational environmental dependence. The environment has a great impact on the performance of organizations and its impact and influence needs to be constantly assessed for sustainability.

The firm must be very keen on the way their operations affects the environment in order to have a good reputation from the community and the general public, hence, the implementation of the new technologies, new regulation frameworks and use of facilities that do not affect the environment since they will have an impact on the customers' perceptions concerning the environment. Failure to which, may results to loss of reputation which may not make the firm sustainable in the environment (Bastedo, 2004).

Green energy firms operate in open systems where they transact with an environment. Thus, the effect on the environments establishes their sustainability and affordability of the clean energy that explains the relevance of the theories in this study.

2.3. Green Energy Strategies

Green strategies involve the degree at which the environmental issues are consolidated into the organization operation objectives (Chitra, 2007). The green energy strategies involve the extent at which the provision of the energy in the various users considering the quality, reliable, affordability and environmental safety to various stakeholders while keenly taking care of low carbon emissions and resource efficiency for social-economic transformation. He further suggests that the green energy strategies are categorized into two that is environmental orientation which entails the awareness of the strategic managers on the ecological concerns in the generation of the energy and green strategy whose practices entails promotion of products and services that are considered environmentally friendly relative to others.

2.3.1 Geothermal Strategy

Geothermal strategy is used by the electric power generating companies as their main strategy in the development of the electric power. The geothermal strategy has a minimum impact on the environment as compared to the thermal and other fossil fuels. The geothermal strategy ensures the facilities are sensitive on the environmental impacts. Before the implementation of the geothermal strategy, an environment review must always be done in order to identify the potential effects on the environment. Thus the geothermal strategy considers the environmental regulations in its development and implementation so that it does not disturb the habitat. (Orsato, 2006).

According to Schaltegger (2015), the geothermal energy generating plants are designed in a way that minimizes the potential effects in the environment. The green energy strategy under geothermal ensures that the power generating pipes are insulated to prevent thermal losses, the generating station is well fenced so as to prevent animals access, installation of containment system that prevents potential spills. The geothermal strategy minimizes the overall impacts on vegetation and wildlife species from the energy.

2.3.2 Wind Strategy

Wind strategy is one of the renewable energy sources for the wind that is sustainable in the environment and has been harnessed for thousands of years. Initially, the wind was used in various areas; from sailing of ship, grinding of grain to pumping of water from the wells. Recently, the wind energy was observed as a way of generating energy using the wind turbines, for the wind kinetic energy that is easily converted into other forms of energy, for both the mechanical energy and electrical energy (Forsyth, 1997).

The wind strategy ensures efficient installation of wind turbines, which will enable the mechanical energy to be converted into electrical energy, although it will require an extensive application of physics. These generates electricity from the mechanical energy drain down to the electric grind which then supplies the electricity to the consumers without interfering with the environment (Carless, 1993).

2.3.3 Solar Energy Strategy

Solar energy strategy is a very large, inexhaustible source of energy whose power from the sun intercepted by the earth is approximately 1.8×10^{11} MW, which is many thousands of times larger than the present consumption rate on the earth of all commercial energy

sources, thus, in principle, solar energy strategy is considered the world long lasting source of energy. This makes it one of the most promising of the unconventional energy strategy. In addition to its size, solar energy has two other factors in its favor. First, unlike fossil fuels and nuclear power, it is an environmental clean source of energy and secondly, it is free and available in adequate quantities in almost all parts of the world where people live (Sukhatmeetet, al, 1996).

According to Ndaba, (2009), solar energy strategy is the way out of the most developing countries considering its sustainability and its environmental impact. The massive solar energy is essential in the distribution of energy in the economy. A recent investigation in Kenya and Tanzania showed that the majority of their electricity supply is generated from solar energy and hydro-power.

2.3.4 Hydro-Power Strategy

Hydropower strategy is the most used renewable energy in the electricity generation industry, for it significantly depends in the rainfall level or the level of the water in the dams. The hydro-power energy has been stipulated in the sustainable development goal of ensuring the region has sustainable green energy for the consumers as it utilizes on the advancement of the climate change (Frey & Linke, 2002). The hydro-power energy makes use of the geographical information system technology by the use of the multitude domains, for it provides the geo referencing information enabling the accurate decisions based on the level of the water in the regions, field work processes on the generation of the electricity. The hydro power strategy is essential in the realization of the sustainable development goal of the clean energy for it put more emphasize of the protection of the

environment and the use of natural resources with no destruction of the biomass (Renewables.com, 2015).

2.4 Green Energy Strategies on Affordable Clean Energy

Implementation of green energy strategies through the SDG is geared towards the provision of affordable, reliable and sustainable clean energy to consumers through great reduction of carbon emission to the environment. This is not only a smooth ground in terms of the financial initiatives and research development but rather need to ensure that customers have an access to information on the environment performance of the products and that they are in position to pay the environmental differentiation costs (Orsato, 2006). There is high emphasize for the firms to be recognized to have adopted the green energy strategies, however, the green strategies are viewed differently by different customers and firms (Saha & Damton, 2005). A sustainable development goal of the green energy strategies is in pursuant of the green marketing belief that ensures the consumption of the energy in the economy is kept at par and does not interfere with the standards of living of future generations.

In order for a firm to provide essential services and products at an affordable price, there is high need to adopt strategies that align on the objectives of the organization while keeping the operations costs at the lowest level possible while emphasizing on the good record of ecological performance. According to Kotler (2008) there is high demand of green products and therefore, high demand for the producers to concentrate on the environmental factors during production.

Peattie & Charter (2003) argued that in order for a product to gain a loyalty in the mind of the consumers they should significantly incorporate the environmental issues so as to be sustainable. However, Ambec & Lanoie (2008) suggest that there is no empirical evidence on the consumer purchasing behaviour due to the greenness position of the firm.

Waddell (2000) established in order for the organization to be sustainable, there is an emphasize of the organization to enhance the reputation and create a good image to the customers through the development of the eco-friendly products that observe environmental production and enhanced processes that adheres to the environment and that through these, the customers will be willing to purchase the products at the prevailing prices. According to Peattie & Charter, (2003) the firms' structure needs to integrate with green marketing policies so as to enhance its sustainability development and overall performance. The organization needs to enhance customer awareness through provision of information on how environmental values are built into the organizational values, products and services competitiveness.

According to Ginsberg & Bloom (2004), the consumer buying decisions are influenced by the prices and products characteristics instead of environmental issues and largely leads consumers believe that green products are of poor quality thus, reluctant to purchase the green products. He recognized that eco-labelling has become effective way of ensuring that customers are informed about the ecological issue on the products compared to other products. Consumers are more aware of the eco-friendly items and are more eager to pay for eco-friendly products (Base et al, 2003).

From the aforementioned studies, it is evident that studies have been done on the related study topic but on a different context and variables than the ones on this study to the best knowledge of the researcher, that is, green energy strategies and sustainable development goals on affordable clean energy. The applications of those studies are therefore limited in their relevance to the current study thereby creating a research gap.

2.5 Summary of the Literature Review and Knowledge Gaps

The study outlines the theoretical basis under which the study is established. These included the open system theory, stakeholders' theory and resource-based view theory. These theories emphasized on the need for the organization to be sustainable without possessing the valuable, rare, unique resources that can enable the firm to provide the affordable clean energy and how the firms are affected by various stakeholders. The various green energy strategies that influence the sustainability and eventually provision of affordable clean energy have been discussed.

From the review of the global and local previous studies, it was evident that the green energy strategy greatly affects the sustainability and affordability of the energy provision, despite the numerous studies on the study topic on the green energy strategies and its affordability, for the studies focused on different variables that affects the green energy strategies, thus it is evident that no studies have been carried out to the best knowledge of the researcher on the green energy strategies and sustainability on the affordability of the energy at KenGen. Therefore, need of this study to fill the gap that exists on the relationship between eco-friendly energy strategies and sustainable development goals on the affordability of clean energy.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter entails the procedures and methods that were adopted in establishing the effect of green energy strategies and sustainable development goal on affordable clean energy. It involved the research design, the population, methods of data collection and analysis.

3.2 Research Design

An explorative research design was preferred to conduct an in-depth study on the effects of green energy strategies and sustainable development goal on affordable clean energy. A case study was preferably suitable for the research for it allowed the researcher to have a comprehensive study on Kenya Electricity Generating Company, (KenGen).

3.3 Population

According to Burns & Burns (2008), Population is the entire collection of interest by the researcher in terms of people, events or items. The research was highly specific thus, the non-probability sampling method was used in the selection of the respondents of the study that enabled the researcher to have relevant information for the research. The population was drawn from 10 respondents who comprise of the chief executive officer and 9 Executive Directors who are members of the executive board committee as they were deemed knowledgeable on the green energy strategies and sustainable development goals on clean energy at KenGen.

3.4 Data Collection

The study used both secondary and primary data in form of interview guide to collect data from the respondents. The questions were open-ended and captured the perception of the respondents on the effects of green energy strategies and sustainable development goals on affordable clean energy. Part1; collected data on respondents' general information, part2; on the green energy strategies and sustainable development goals while part3; on the affordability of clean green energy.

3.5 Data Analysis

Data analysis is the process of data coding, entry and common methods of data analysis (Mugenda & Mugenda, 2003). It was expected that most of the data was qualitative and was collected from a single organization, and thus was analyzed using the content analysis technique. Therefore, the data was collected, edited, coded and analyzed for completeness and consistency using the content analysis. The content analysis allowed understanding the data from the respondents. The data was then presented in line with the literature review and the use of tables where applicable.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the research data alongside the outcome of its analysis. It covers the analysis and the interpretation of the findings. The findings yield insights that offer answers to the research questions.

4.1.1 Response Rate

The researcher targeted 10 respondents in the study. All these respondents were involved in the study and responses were sought from all of them during the interview. This represented a response rate of 100%. This response rate was considered satisfactory since it crossed the minimum threshold recommended by Cooper and Schindler, (2010).

4.2 General Information

Respondents of the study were requested to indicate the position they held in their respective organization. From the findings, one of the respondents was the Chief Executive Officer while others were Executive Directors. The finding therefore shows that respondents of the study were in senior positions of the organizations and therefore in one way either directly or indirectly were involved in decision-making as it regards to formulation and implementations of green energy strategies at KenGen.

The researcher sought to establish the work experience of the respondents in the organization where Table 4.1 below shows the findings.

Table 4.1: Respondents' Work Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2-5years	2	20.0	20.0	20.0
	6-10 years	5	50.0	50.0	70.0
	11-15 years	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Source: Researcher (2017)

Most of the respondents (50%) had worked between 6 and 10 years, followed closely by the respondents who had been in the organization for more than 11 years (30%). The least among the respondents had served in the organization for less than 5 years, which represented 20% of the respondents. However, most of the respondents had worked for over five years. This indicated that they were knowledgeable since they had gained relevant information of how green energy strategies affected sustainable development goals on energy at KenGen.

The study sought to determine the levels of education of respondents. From the findings, over half of the respondents held postgraduate qualifications. The study further noted that these respondents held different specializations and professional areas. These findings indicate the respondents of the study were literate and therefore knew how to answer questions sought by the interview guides.

4.3 Definition and benefits of green energy Strategies

When asked to define green energy and its importance to an organization, interviewees said it was dependence of natural sources to generate energy, which does not pollute environment. Respondents pointed out that the natural sources that KenGen leveraged

upon for green energy was wind, sunlight, water, geothermal heat (earth steam) among others. Several benefits that accrued from green energy included environmental friendliness where it helped in reducing environmental pollution while at the same time increased volumes that eventually reduced costs of operations.

4.3.1 Strategic Plan and Green Energy

The study sought to determine how green energy was incorporated in the organization's strategic plan. From the findings, all of the respondents attributed to the overall vision and mission statements to recognize the need to use green energy for sustainable development.

On whether there were green energy strategic policies and regulations, vast majority of the respondents agreed. Respondents indicated that indeed an organization had established clearly defined policies and regulations that guided green energy strategies.

When respondents were asked to indicate an individual responsible for the formulation and implementation of the strategic plan in the organization, most of the respondents said formulation of strategic plan was not done by an individual but by the collective top management team and the board. The study established that once the strategic goals had been formulated, they are passed down to all levels of management for implementation. The study found out that adequate resources are provided during the implementation phase.

In view of the type(s) of green energy strategies that were in place at the organization, most of the respondents indicated Solar Energy, Geothermal, Hydro-Power and Wind Energy Strategies.

When the respondents were asked on the levels of the green energy generation levels, the response were indicated in the Table 4.2 below,

Table 4.2: Current & Expected Green Energy Generation Levels

Green Energy Strategies by 2017	Current Generation	Percentage	5 year Expected Generation
Hydro-Power	820MW	50.25	160MW
Geothermal	530MW	32.48	795 MW
Wind	26MW	1.59	475MW
Solar	-	0	45MW
Others	256MW	15.69	600MW
TOTAL	1632MW	100	2175MW

Source: Researcher (2017)

The above findings indicate that hydro-power produces the highest Mega Watts by now at 50.25 but will be overtaken in near future by geothermal which commands production of 32.48. Wind power is low by now but too will pick in near future from the already wells under construction. Solar power is cheap in terms of production and is not yet produced by now though one of the 45 MW solar site is ready for construction. Others, thermal has declined to 256 MW and is expected to be phased out as 600 MW of coal is being studied for construction.

4.3.2 Solar Green Energy

In respect to solar strategy, it was clear that formal strategic planning and policies guide are underway for operations of the green energy strategies at KenGen. Respondents indicated that regular evaluation of the environment helped the organization appraise the

issues it needs to consider when deciding on green energy strategies. Respondents said that sustainable goals through the energy conservation policy are communicated to the employees, and that they inform other aspects of operations such as the organizational culture, the tactical and operational plans and activities. Therefore, the Kenya Electricity Generating Company has no choice but to communicate the details of the energy strategies to all employees through policies in order to be incorporated in all activities and tasks to enable the sustainability towards the development goals.

4.3.3 Geothermal Green Energy

In regard to Geothermal Strategy, respondents said that the environmental policy was highly considered in the generation of the electric power. According to (Orsato, 2006) the consideration of the environmental regulation in the geothermal strategy enables the development of the sustainability of the energy sector and they implementation that do not disturb the habitat. Respondents said that KenGen considers geothermal strategy to be a valuable strategy that helps it attain its strategic goals.

4.3.4 Hydro-Power Green Energy

In view of the Hydro-Power Strategy, respondents said that the hydro-power energy policy on environmental conservation was highly considered in the organization. Respondents said that the hydropower strategy, which is commonly used in the organization, was one of the most reliable strategy implemented in the organization since it had developed technology that provided efficient information for evaluation of the environmental impact in the society. Respondents further indicated that the hydro-power strategy provided an avenue for energy efficiency, conservation, exploring and

development of the resources in the organization as stipulated by (Kant, Masiga & Veenstra, 2014).

4.3.5 Wind Green Energy

On Wind Energy Strategy, interviewees indicated that regular evaluation of the environment helped the organization apprise the issues it needs to consider when deciding on green energy strategies. Respondents also agreed that green energy strategies on sustainable development goals do not remain static, and they do change in tandem with the developments in the environment, thus need to review their environmental energy policies. Indeed, according to the resource-based theory, for a sustained performance by an organization, there is need to exploit resources that are non-substitutable, rare, imperfectly imitable and valuable (Hart, 1995). Respondents said that sustainable goals through the solar energy conservation policy were communicated to the employees, and that they informed other aspects of operations such as the organizational culture, the tactical and operational plans and activities. Therefore, the Kenya Electricity Generating Company had no choice but to communicate the details of the energy strategies to all employees through policies in order to be incorporated in all activities and tasks to enable the sustainability towards the development goals.

When asked to indicate the period, which an organization had been engaging in green energy strategy, respondents said that following the energy sectoral reforms in 1996, the management of KPC was formally separated from Kenya Power and renamed KenGen in January 1997. Green strategies therefore have green all along from this period to current period. Respondents said that when combined, all the four green strategies have a combined installed capacity of 1,632MW to the national grid.

On the drivers of the green energy and challenges facing them, most of the respondents said qualified and dedicated staff, a large customer base, and Government policy on last mile connectivity coverage, and increase in manufacturing companies across the country. The study noted that these drivers generally grew the level of revenue of the company while at the same time enabling the company to maximize the wealth of its shareholders. The study however noted challenges that green energy adoption and majority of the respondents said inadequate capital for expansion of these projects, rapid changes in technology that require massive investments, long periods of site exploration and negative cash flows in the start years during launching and commercialization of projects.

On the stability of the power generated through these strategies, respondents said these strategies yielded stable power that boosted revenue of the company. The power was stable as it relied on green constant sources. On effectiveness of these strategies on environmental impacts, the study established that green energy strategy played significant role in environmental health. The study established that the green energy strategies did not result into environmental pollution, which would lead to health concerns to the community.

The study sought to investigate how the green energy strategies were funded and how massive they were. Majority of the respondents said involved funding is in billions largely done through big financial firms like World Bank (WB), International Monetary Fund (IMF), US Trade & Development Agency (USTDA) and African Development Bank (ADB), International partnership, the government grand, and shareholders. Respondents indicated that the government plays an important role in funding the operations of green energy strategies. Respondents noted that from the time of inception

up to until 2006 when the company was listed at NSE, and the Government of Kenya sold 30% of its stake in the company through a very successful Initial Public Offer (IPO), acquisition to capital was enhanced. The company occasionally issue rights issues that enhances implementation of these green energy strategies.

Respondents were requested to indicate how the company communicated out the green energy strategies. Most of the respondents said majorly through the vision and mission statements of the company, publication of financial statements on dailies on a regular basis detailing overall performance, through corporate social responsibilities and the future in terms of green energy projects to be implemented. Respondents also cited the use of televisions in creating awareness among users.

The study sought to investigate the frequency which the company trains and develops its staff on green energy strategies. From the findings, the study established that the company had put in place regular training programs to its staff on how effective to implement the green energy strategies. The training was mostly centered on changes in technology besides encouragement of creativity and innovativeness to enhance performance aiming at continuity in operations besides succession.

4.4 Affordability of the Clean Energy

The study sought to assess one who did billing estimates to the grid and the position he/she owned in the organization. From the responses, most of the respondents said that competent and qualified experts are hired by the company do billing estimates. The respondent sought to establish if there are price changes due to the implementation of the green energy strategies and that the current price of 1.21/kwh to the grid is considered

relatively fair to consumers. Indeed the energy currently produce by the organization meets the SDG threshold of reliable, affordable and sustainable to the customers

The study sought further to determine whether Green Energy had solved the problem of power inadequacy. Respondents said that in engaging on green energy by the firm there has been less power black outs and surge experienced due to constant producing components and that they supplement each other in case of environmental interference. The green energy through the policies and their implementation leads to lowering the cost of the renewable energy, which makes it prudent in making the green energy affordable to various stakeholders (REA, 2017).

4.5 Discussion of Findings

The organization has structured itself to the expectations of SDG by putting in place Solar Energy Strategy, Geothermal Strategy, Hydro-Power Strategy and Wind Energy Strategy as green energy strategies. Kenya Electricity Generating Company has no choice but to communicate the details of the energy strategies to all employees through policies in order to be incorporated in all activities and tasks to enable the sustainability towards the development goals.

The environmental policy was highly considered in the generation of the electric power and as according to (Orsato, 2006) the consideration of the environmental regulation in the energy strategies enables the development of the sustainability of the energy sector and they implementation that do not disturb the habitat.

The hydro-power strategy, which is commonly used in the organization, was one of the most reliable strategies implemented in the organization since it had developed

technology that provided efficient information for evaluation of the environmental impact in the society. Respondents further indicated that the hydro-power strategy provided an avenue for energy efficiency, conservation, exploring and development of the resources in the organization as stipulated by (Kant, Masiga & Veenstra, 2014).

On Wind Energy Strategy, regular evaluation of the environment helped the organization apprise the issues it needs to consider when deciding on green energy strategies. The green energy strategies on sustainable development goals do not remain static, and they do change in tandem with the environmental developments thus, need to review their environmental policies on energy strategies. Indeed, according to the resource-based theory, for a sustained performance by an organization, there is need to exploit resources that are non-substitutable, rare, imperfectly imitable and valuable (Hart, 1995).

Sustainable goals through the solar energy conservation policy were communicated to the employees and that they informed other aspects of operations such as the organizational culture, the tactical and operational plans. Hence, KenGen had no choice but to communicate the details of the energy strategies to all employees through policies in order to be incorporated in all activities and tasks to enable the sustainability towards the development of the goals.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings of the study and draws the necessary conclusions. The findings provide valuable insight on how the green energy strategies enhance affordability of green energy. The chapter also highlights the limitations of the study and suggests areas for further research.

5.2 Summary of the Findings

The findings suggest that in line with UNSDG, the green energy strategies ensure the provisions of the green energy in the organization. The respondents agreed having the policies in the organization on the green energy strategies that helps in attaining the strategic goals of the affordability of the green energy. The respondents also agreed that there is need to regularly review their environmental policies and regulatory bodies in order to ensure that the strategies are adopted appropriately as per the environmental factors. The respondents also agree that strategic goals do not remain static, and they do change in tandem with the developments in the external environment. The respondents also agree that the organization goes to great lengths to ensure the employees are undertaken through the environmental conservation policies, including importation of green energy equipment.

The model explains some of the variation in the dependent variable, and considering that the regression model is significant, this proportion of variation is indeed actual and not random. Increased environmental conservation is embodied in the fact that little impact

will be shown in the environment, while provision of the green energy will ensure sustainability of the organization due to consideration of the stakeholders in their operations. Environmental conservation and sustainability of the operation are logical outcomes of improving affordability of the green energy. The Kenya electricity generating company considers green energy strategies to be valuable tools as their help attaining the strategic goals while ensuring the energy is affordable to the general public.

5.3 Conclusion

Green energy strategies have a significant impact on the affordability of the green energy. The organization has moderately exploited the resources being offered by the external environment. There is high need to incorporate the strategies that will effectively enhance the provision of the green energy sufficiently in order to achieve the objective of making the energy affordable to all and to remain sustainable. There more emphasize to develop the strategies and regularly evaluate the environment in order to achieve the sustainability development goals and implementation of the appropriate green energy strategies in the environment.

In order to make the green energy affordable, there is an emphasize to sensitive on the rules and regulations concerning the green energy strategies, and develop the policies and standards that will enhance full adoption of the green energy strategies in the organization and this will ensure all the employees and management are focused on the sustainable development goals of green energy development and affordability. With a clear policies on the strategies it is will ensure that the strategies are operational and effectively put in place to ensure the affordability of the green energy is achieved.

5.4 Recommendations from the Study

The organization should increase the investment in training employees on the green energy strategies for it is a good way to enhance the adoption of the green energy strategies and operationalization of these strategies. In an era of more concern in the environment and increase demand on the green energy, it is essential for the organization to put all the stakeholders into consideration in their implementation of the green energy strategies. Socio-economic consideration is paramount for does not remain constant and that adapting to these strategies will enable the organization to meet their objectives, mission and vision in the organization and society in general. The strategic planning should also be incorporated in these strategies for it will ensure that the strategies are achieved and also will allow the innovation and creativity in the strategies hence facilitating the achievement of the affordability of clean green energy.

5.5 Limitations of the Study

The study was anchored on strategy models that are largely applicable to commercial electricity generating company. It is not clear how appropriate these strategy models considering other control variables that affects the affordability of the green energy. Such control variables can help generates insights on the extent of the strategy models in the organization and how it affects the implementation of the green energy strategies in the organization. For instance, innovation paradigm on the issues of the green energy strategy should be considered in the dimensions of sustainable development goals to see if it will still yield the same valid findings.

5.6 Suggestions for Further Research

This study should be replicated but there should be additional control variables that capture the idiosyncrasies of green energy strategy at Kenya electricity generating company. The control variables would be helpful in figuring the applicability of strategy models for in the organizations, and such insight would help in the strategic planning process in electricity generating companies. There is need for the KenGen to adopt effective mechanisms of strategic planning, and this means it is important for it to use the right models.

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Appendix I: Interview Guide

This interview guide is intended for use in collecting data in pursuit of the objectives of the study titled “**Green energy strategies and sustainable development goal on affordable clean energy**”. The guide is on general survey participant information, green strategy and sustainable development goals and effect of the green energy strategies on affordable clean energy. All information given will be strictly confidential. All data collected is for academic purpose only. Your participation is highly appreciated

Part 1: General Information

1. What is your position
2. How long have you worked for the Organization?
3. What is your academic level?

Part 2: Green Energy Strategies

1. What is green energy and why is it of important in your organization?
2. How is green energy incorporated in your organization strategic plan?
3. Do you have green energy strategic policies and regulations?
4. Who is responsible for the formulation and implementation of the strategic plan and what is his/her position in the organization?
5. What type(s) of green energy strategies do you have?
6. What is your current green energy generation levels?
7. How is the stability of the power generated through these strategies?
8. How effective are these strategies on environmental impacts?
9. How these green energy strategies funded and how massive are they?
10. How often do you train and develop the staff on these strategies?

Part 3: Affordability of the clean Energy

1. Who does your billing estimates to the grid and what position does he/she owns in the Organization?
2. Are there price changes as a result of green energy implementation and has it increased the level of the connections?
3. How has Green Energy solved the problem of power inadequacy?
4. How do the organization comply in achieving the objective of Sustainable Development Goal on Energy?
5. How dispersed is the national grid within the nation?
6. What is the government’s main agenda on Green Energy development?

Appendix II: Letter of Introduction



UNIVERSITY OF NAIROBI SCHOOL OF BUSINESS

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE 10/10/2017

TO WHOM IT MAY CONCERN

The bearer of this letter ... HONNOR SAMUEL KOSGEY

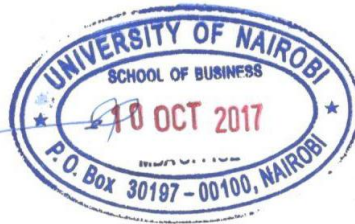
Registration No. DG/84071/2015

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.



PATRICK NYABUTO
SENIOR ADMINISTRATIVE ASSISTANT
SCHOOL OF BUSINESS