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Towards achieving energy for sustainable development in Nigeria

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ABSTRACT

The importance of energy availability in the economic growth, social and political development of every nation cannot be overemphasized. Affordable and reliable energy availability is the precondition for sustainable development. Sustainable development calls for an efficient, reliable and decentralized energy economy, based on local and clean energy sources, in which the price paid by the consumer will reflect the real cost of energy products to the economy. There is clear evidence that Nigeria is blessed with abundant resources of fossil fuels as well as renewable energy resources. The major challenge is inefficient utilization of energy in the country. There is no doubt that the present power crisis afflicting Nigeria will persist unless the government diversifies her energy sources and adopt new available technologies to reduce energy wastages and save cost. This study examines the perspective of energy efficiency and renewable energy in the making of strategies for a sustainable development in Nigeria. Such strategies involve energy savings on the demand side, efficiency improvements in the energy production, and replacement of fossil fuels by various sources of renewable energy. Factors that need to be considered in the shift to its sustainable energy future are examined in this article.

Contents

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1. Introduction

Energy is one of the most fundamental issues for sustainable development. Sustainable development is a changing process, circuiting investment, orientating technology and institution for compatible with the needs of the present and the future. Electricity is conceivably the most multipurpose energy carrier in modern global economy, and therefore primarily linked to human and economic development [1].

Globally, the quest for sustainable development has heightened today more than ever before. There are increasing awareness and concern for sustained economic development and growth.

Sustainable energy has turned into one of the most promising ways to handle the challenges of energy demand problems of numerous consumers worldwide [2].

Sustainable Energy Development Strategies typically involve three major technological changes: energy savings on the demand side, efficiency improvements in the energy production, and replacement of fossil fuels by various sources of renewable energy. Consequently, large-scale renewable energy implementation plans must include strategies for integrating renewable sources in coherent energy systems influenced by energy savings and efficiency measures [3].

The importance of energy in the economic, social and political development of every nation cannot be overemphasized. Transportation, industrial activities, communication, health, and education are some of the areas where energy cannot be substituted. Improvement in standard of living is manifested in rise in food production, increased industrial output, the provision of efficient transportation and telecommunication, adequate shelter, improved healthcare delivery and other human services; each of these requires increased energy consumption. Thus, future energy requirement is expected to grow with increase in standard of living, industrialization and other socio-economic factors. However, inadequate supply of energy restricts socio-economic activities, constrains economic growth and adversely affects the quality of life [4].

Energy is a critical input for the achievement of many of the Millennium Development Goals, including eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality and empowering women, reducing child mortality, improving maternal health, combating diseases, and ensuring environmental sustainability. For adults and children, gaining access to reliable electricity enhances their quality of life and enables income-generation. Modern cooking and heating solutions can transform the lives of billions—many of whom spend hours collecting and transporting firewood and other forms of biomass, and all of whom are exposed to household air pollution from solid fuels, which killed an estimated 3.5 million and caused many more cases of respiratory, cardiovascular, and other illnesses in 2010 [5]. Beyond household access, electricity is a critical input to the effective delivery of social services, which help lift populations out of poverty and enable economic growth. Lighting, refrigeration, and effective sterilization procedures enabled by electricity supply make healthcare far more effective, and electricity similarly improves education by enabling superior lighting and powering of computers and other equipment.

For Nigeria to meet up with the Vision 20:2020; Nigeria requires power generating capacity of 140,000 MW as against the current capacity of about 8039 MW [6]. This will put Nigeria slightly below South Africa with per capita power capacity of 1047 W, UK with per capita power capacity of 1266 W and above Brazil with per capita power capacity of 480 W, China with per capita power capacity of 260 W [7]. Currently Nigeria has per capita power capacity of 28.57 W and this is grossly inadequate even for domestic consumption. To the much desired millennium development goals a strong energy sector is essential for a vibrant and competitive economy.

The National energy supply is at present almost entirely dependent on fossil fuels and firewood (conventional energy sources) which are depleting fast. Despite the abundance of energy resources in Nigeria, the country is in short supply of electrical power. Access to reliable and stable supply of electricity is a major challenge for both the urban and rural dwellers. Only about 40% of the nation's over 140 million has access to grid electricity and at the rural level, where over 70% of the population live, the availability of electricity drops to 15% [8]. An analysis of Nigeria's electricity supply problems and prospects found that the electricity demand in Nigeria far outstrips the supply, which is epileptic in nature. The acute electricity supply hinders the country's development and not only restricts socio-economic activities to basic human needs; it adversely affects quality of life.

Nigeria's unreliability of supply and decline in traditional fossil fuel production, combined with very grave environmental matters and continued uncharted economic and population growth makes it imperative to search for alternative forms of energy. Whilst proceed with increasing the generation capacity, transmission and distribution of existing traditional energy sources through the development of energy systems and policies that enhance social, economic and environmental performance; it is appropriate to focus on alternative to the traditional energy sources which among other things is capital intensive, and the technology required becomes obsolete with a short space of time thereby requiring intensive overhauling of the machineries or better still a complete replacement of the existing technology with a newer innovation leading to colossal waste of fund. However, the answer to the present imbroglio may be found in renewable and sustainable energy forms both for rural and urban areas of the country.