

Title: Solar Energy Applications and Development in Nigeria: Drivers and Barriers.

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Outlet: Elsevier Publisher: Renewable & Sustainable Energy Reviews

Date:

Abstract: In this study, current perspectives of solar energy utilization as a renewable energy option in Nigeria are examined and discussed from the standpoint of sustainable development. The country being a world crude oil and natural gas producer is over-dependent on these energy sources for electricity generation and other energy applications. This has currently put the country at a risk of impending energy crises in view of the fast diminishing fossil reserves, inadequate refining capacity to meet domestic consumption and serious cases of energy insecurity in restive regions where exploitations exist. In spite of the vast fossil based energy reserves, a meagre electricity production capacity that is put at 4517.6 MW as at December 2012 is generated to support the economy of a teeming population of approximately 170 million people. Nigeria is naturally endowed with abundant deposit of renewable energy resources of which solar energy from the Sun (being the world's most abundant and permanent energy source) has for decades been enjoying very high level utilization by rural dwellers for agricultural processing in the country. It is vastly deposited with an estimated 17,459,215.2 million MJ/day of solar energy falling on the country's 923,768 km² land area (approximate range of 12.6 MJ/m²/day in the coastal region to about 25.2 MJ/m²/day in the far north). The different applications to which solar resources have been put and the extent of utilization (including details of existing projects) in the country were thoroughly investigated and discussed. The possible motivations for extensive development of solar energy conversion systems in Nigeria are also discussed and some of the barriers and challenges are presented. Steps and policy measures to overcome the barriers and facilitates the utilization of this resource are suggested.