Solar thermal energy ethiopia

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More than half of Africa"s population lives in rural and remote areas. Most of these communities lack access to electricity due to a lack of or weak grid infrastructure isolating them. Solar energy, with its year round availability in the region, is the best option for overcoming this issue via off grid solutions [3].

Energy is a necessary component of any nation"s social and economic development. With an increase in agricultural and industrial activities in Africa, modern forms of energy are required for optimal start up, efficiency and sustainability of these activities, which are required for the African continent"s development. Unfortunately, access to modern forms of energy has eluded Africans, with only about 30% of the population having access to electricity and 90% relying on traditional cooking fuels [4].

The solar resource is relatively lower in the country"s most populous Northern, Central and Western highlands, whereas the rift valley regions and Western and Eastern lowlands receive higher annual average irradiance (above 6 kWh/m2/day). Even though the country had abundant solar energy resources, only about 14 MW of solar photovoltaics were used for telecom service, lighting, powering water pumps in rural areas, and water heating in major cities. So, this study is intended to review the status of solar energy utilization, development, opportunities and challenges in Ethiopia.

Statement of the problem

Solar energy is one of the most appealing renewable energy sources on the planet. It is abundant in nature and is free, with the main disadvantage to date being the low efficiency and high cost per kWh of solar cells. Due to the low efficiency of solar cells, large areas (huge solar cells) are required for large scale solar production. As a result, various recent studies are focusing on solar cell designs to make them cheaper and/or more efficient, as efficiency is what makes them competitive with other renewable energy systems. The lack of energy storage technology is also a challenge for the system, as there is a significant difference in power output during the day [7].

The remote homes and villages in developing countries derive their energy from environmentally harmful practices due to the inaccessibility of clean, renewable energy sources. The traditional and most important energy source is fuel wood and charcoal made from fuel wood. Also called potentially renewable biomass, these are the main sources of energy for heating and cooking for roughly half the world’s population. Within a few decades, one fourth of the world’s population in developed countries may face an oil

shortage, but half the world’s population in developing countries already faces a fuel wood shortage.

About 5 MW installed capacity of solar electricity generating units have been put in use (excluding water pumping for which data could not be obtained). Even though the total exploited solar energy looks insignificant, the energy demand being addressed through these solar installations is vital, serving remotely located rural communities, schools and health centers with badly needed electricity services, that otherwise would not have been served.

General objectives of the study: The main objective of this systematic r eview is to identify the present status of solar energy utilization and development in Ethiopia and any possible challenges that may hinder its utilization and development.

• To examine the status of solar energy utilization in Ethiopia. • To assess solar energy potential and development opportunities in Ethiopia. • To identify the main challenges in utilizing solar energy in Ethiopia.

• To what extent does solar energy utilization exist in Ethiopia? • How many solar energy potential and opportunities exist in Ethiopia? • What are the main challenges in utilizing solar energy in Ethiopia?

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Web: https://kary.com.pl/contact-us/
Email: energystorage2000@gmail.com
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