Assessment of Solar Energy in Eastern Samar, Philippines

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Abstract

The Electricity rates in Eastern Samar have been steadily increasing, creating a need to explore alternative and more cost-effective energy sources. One promising solution is harnessing solar energy, a sustainable and abundant resource. While solar panels are commonly used to collect sunlight and convert it into electricity, this study focuses on the potential for using parabolic trough systems, which require high levels of Direct Normal Irradiance (DNI) for optimal performance. To determine the feasibility of this approach, solar radiation data was gathered and analysed across various municipalities in Eastern Samar. The results revealed that the province receives sufficient solar radiation, particularly in San Policarpo, Can-Avid, and Dolores—three municipalities that recorded the highest monthly and yearly average DNI values. These locations, coupled with consistent and stable temperature conditions, are ideal for the implementation of solar energy projects using concentrated solar power technologies like parabolic troughs. The combination of high solar energy potential and favourable climate conditions makes Eastern Samar a suitable site for solar power development. By focusing on high-DNI areas and investing in advanced solar technologies, the province can reduce its dependence on expensive electricity sources, lower energy costs, and promote sustainability. This study strongly supports the development of solar infrastructure to meet the region's growing energy demands and secure its energy future.

Keywords

Solar PV, Solar Irradiance, Parabolic Trough, Renewable Energy, Solar Energy,