



Hydrogen Energy Paradigm in São Tomé and Príncipe: An African Perspective on Future Fuel Security

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Abstract

São Tomé and Príncipe is an archipelagic nation in central West Africa with limited conventional energy resources. Hydrogen energy, as a potential future fuel source, has garnered interest for its clean and versatile properties. A literature review was conducted to assess existing renewable energy policies and potential technologies. Stakeholder consultations were also undertaken to gather insights on local needs and challenges. While the initial cost of hydrogen production is high, there are significant opportunities for economies of scale that could reduce costs over time. Local expertise in solar power generation can be leveraged to support hydrogen production. São Tomé and Príncipe's unique energy landscape presents an opportunity to explore innovative solutions like hydrogen energy as part of a diversified renewable portfolio. Government investment should prioritise research and development, alongside partnerships with international organizations. Public-private collaborations are recommended for infrastructure deployment. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Hydrogen Energy, African Geography, Renewable Fuels, Policy Analysis, Sustainable Development, Energy Security, Green Technologies*

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