

ABSTRACT

The transition to renewable energy is not merely a technical issue it also involves complex social, economic, and political dynamics. This study seeks to explore in depth the potential of renewable energy sources in the Karimunjawa Islands, identify how renewable energy (RE) is being implemented, and evaluate the barriers and solutions associated with its application. Using a qualitative phenomenological approach (Interpretative Phenomenological Analysis), the researcher conducted interviews with key stakeholders, including regional government officials and national electricity operators such as the Head of Bappeda Jepara, the Subdistrict Head of Karimunjawa, the Manager of PLN for IPP & Renewable Energy, the Operations Manager of PLN Indonesia Power, the Network Assistant Manager of PLN Kudus, and the Electricity Planning Official of PLN UID Central Java & Yogyakarta. The findings reveal that the natural potential for renewable energy in Karimunjawa comprises three main sources: solar power, wind energy, and ocean wave energy. However, based on field studies, solar and wind energy are the most feasible for implementation. Technical barriers include underdeveloped infrastructure, limited freight transport fleets, battery based energy storage systems, and a lack of local human resources with adequate competence in managing RE. Economic barriers involve high initial investment costs, limited regional government budgets, and the absence of strong innovative financing schemes or public-private partnerships. On the social side, there is a relatively minor barrier in the form of low public awareness. Politically, the study found no significant obstacles, as both local government and community show strong support for RE implementation in Karimunjawa. Despite these challenges, there remains strong potential for RE adoption in the Karimunjawa Islands. The study proposes several strategies on the technical side, the integration of hybrid solar PV and wind power (PLTS-PLTB) with smart grid technology based on IoT and Battery Energy Storage Systems (BESS), on the economic side, the development of public-private partnership (PPP) schemes, tariff incentives, renewable energy educational tourism, green tourism through an electric lifestyle pilot program, and the application of cross subsidy tariffs. Social strategies include community based participatory education and engagement, and the technical training and capacity building of local technicians. Politically, harmonizing policies between local government and PLN is seen as a way to reduce logistical barriers and strengthen operational support for RE deployment. In conclusion, this study provides a comprehensive picture of the renewable energy potential in Karimunjawa particularly solar and wind as well as the multidimensional challenges in its implementation. It emphasizes that integrated, context-sensitive solutions, supported by multi stakeholder collaboration and participatory approaches, are essential to realizing Indonesia's Net Zero Emission target by 2060.

Keywords: *Renewable energy, Karimunjawa, Barriers, Solutions, Phenomenology, Energy Transition, Net Zero Emission.*

SEMARANG
FEB UNDIP