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Economic Analysis of Wind Power Integration in Eastern Sumba Grid

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ABSTRACT

Eastern Sumba has been burning diesel fuel for generating electricity despite possessing abundant wind power source. An effort to encourage wind power use in Eastern Sumba power generation has been promoted through NREL recent study in evaluating the technical feasibility of integrating wind power into Eastern Sumba grid. An economic analysis has been performed to investigate the cost and benefit of integrating 850 kW wind power system to replace a diesel generator use in Eastern Sumba grid. Three economic indicators are measured the economic feasibility of the wind power system implementation while being compared to the existing diesel generator. The results demonstrated that wind power system carries much lower generation cost and subsidy rate than diesel generator with a short payback period. Three cost-reduction scenarios were proposed to bring the generation cost at breakeven point with the current electricity price. While breakeven point could not be reached, the scenario has successfully reduced the wind power system generation cost by 35% and cut the current energy subsidy by 94% when applied. This study is hoped to provide some insights to encourage more rigorous renewable energy deployment in Eastern Sumba and to fasten the process to reach 100% electrification rate in Sumba island with renewable energy power generation.

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