

Cost and Reliability Analysis of the Hybrid Renewable Energy System

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Demand for electricity resource diversification has been increasing recently due to the environmental impacts of the conventional power plant. One of the promising solution is renewable energy utilization, of which the most renowned are photovoltaic and wind power. However, renewable energy resources are highly intermittent in supply, making renewable energy system design difficult to design. By integrating renewable energy system with energy storage system such as battery bank, one can achieve intermittent energy supply to electricity demand matching. Though steadily decreasing as the technology advances and supply increases, construction cost of the renewable energy system and energy storage system is still high. Therefore, sophisticated consideration of the renewable energy characteristics is required to design renewable energy system so that the system is economically viable. In this research, we analyzed the cost and reliability of the renewable energy and energy storage hybrid system. We used stochastic process analysis and Monte-Carlo method to account for renewable energy uncertainty, and cost-reliability analysis is performed for economic feasibility of the system.