Analisis kelayakan investasi pembangkit listrik tenaga surya di Kalimantan Timur menggunakan metode Value at Risk = Feasibility analysis of investing solar power plant in East Kalimantan using Value at Risk method

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Abstrak

Penelitian ini bertujuan untuk menganalisis kelayakan investasi Pembangkit Listrik Tenaga Surya (PLTS) ground-mounted di Kalimantan Timur dengan menggunakan metode Value at Risk (VaR). Metode ini digunakan untuk mengukur potensi kerugian dari proyek investasi dengan mempertimbangkan faktor ketidakpastian seperti tarif Power Purchase Agreement (PPA) dan biaya Operasional dan Pemeliharaan (O&M). Analisis dilakukan melalui model keuangan Discounted Cash Flow (DCF) dan simulasi Monte Carlo untuk mengevaluasi indikator kelayakan investasi seperti Net Present Value (NPV), Internal Rate of Return (IRR), dan Debt Service Coverage Ratio (DSCR). Hasil penelitian menunjukkan bahwa sebelum mempertimbangkan faktor ketidakpastian, proyek ini memiliki NPV sebesar Rp6,967,654,946, IRR sebesar 15%, dan DSCR sebesar 3,55, yang mengindikasikan kelayakan investasi. Setelah mempertimbangkan seluruh faktor ketidakpastian, investasi pemasangan PLTS ground- mounted memiliki NPV at Risk sebesar Rp5,315,929,980 IRR at Risk sebesar 11.36%, dan DSCR at Risk 2.98. Dengan tingkat kepercayaan 95% dan periode simulasi selama 20 tahun, proyek PLTS ground-mounted ini masih layak untuk diinvestasikan. Penelitian ini diharapkan dapat menjadi referensi bagi Independent Power Producers (IPP) dan investor dalam mengidentifikasi dan mengelola risiko pada proyek PLTS di Indonesia.

.....This study aims to analyze the investment feasibility of a ground-mounted Solar Power Plant (PLTS) in East Kalimantan using the Value at Risk (VaR) method. This method is used to measure the potential loss of investment projects by considering uncertainties such as Power Purchase Agreement (PPA) tariffs and Operational and Maintenance (O&M) costs. The analysis was conducted through a Discounted Cash Flow (DCF) financial model and Monte Carlo simulation to evaluate investment feasibility indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and Debt Service Coverage Ratio (DSCR). The results of the study indicate that before considering uncertainties, the project has an NPV of Rp6,967,654,946, an IRR of 15%, and a DSCR of 3.55, indicating investment feasibility. After considering all of the uncertainties, the NPV at Risk is Rp5,315,929,980, the IRR at Risk is 11.36%, and the DSCR at Risk is 2.98. With a confidence level of 95% and a simulation period of 20 years, the ground- mounted PLTS project is still feasible to invest in. This study is expected to be a reference for Independent Power Producers (IPP) and investors in identifying and managing risks in PLTS projects in Indonesia.