

## INTISARI

Penelitian ini merupakan studi kelayakan retrofit dan analisis potensi keberlanjutan pada pembangkit listrik tenaga mikrohidro (PLTMH) yang mangkrak di Kabupaten Banjarnegara. Kelayakan retrofit dilakukan pada aspek teknoekonomi. Kelayakan retrofit pada aspek teknik dilakukan dengan mengganti dan menambahkan komponen-komponen yang disesuaikan dengan kondisi objek penelitian saat ini. Analisis kelayakan ekonomi meliputi analisis *NPV* (*net present value*), *PBP* (*payback periode*), *BCR* (*benefit cost ratio*), *IRR* (*internal rate of return*) dan *LCOE* (*levelized cost of energy*). Analisis kelayakan teknoekonomi yang telah dilakukan dilanjutkan dengan menganalisis potensi keberlanjutan dari mikrohidro tersebut. Potensi keberlanjutan dianalisis menggunakan indikator keberlanjutan yang diadaptasi dari metode Iiskog dan Afifah. Hasil penelitian menunjukkan bahwa PLTMH Blimbing secara teknis masih layak untuk dioperasikan dengan melakukan beberapa perbaikan pada aspek teknis. Berdasarkan analisis kelayakan ekonomi skenario 1A dan 1B tergolong tidak layak, sedangkan skenario kelayakan ekonomi 2A dan 2B tergolong layak. Analisis potensi keberlanjutan meliputi empat dimensi, diantaranya: teknik, ekonomi, lingkungan, dan sosial-kelembagaan. Masing-masing dimensi memiliki indikator-indikator yang telah ditetapkan. Diantara keempat dimensi keberlanjutan, nilai potensi keberlanjutan paling rendah berada pada dimensi sosial-kelembagaan yakni sebesar 26,67%. Rendahnya nilai potensi keberlanjutan dalam dimensi sosial-kelembagaan disebabkan oleh belum adanya lembaga pengelola dan utilisasi energi listrik dari PLTMH Blimbing.

Kata kunci: ulir, indikator berkelanjutan, retrofit, pembangkit mikrohidro

## **ABSTRACT**

*This research is feasibility study of retrofit and sustainability potential analysis in the abandoned Blimbing micro hydropower plant in Banjarnegara. Feasibility study of retrofit based on techno-economic and sustainability potential analysis. Feasibility of retrofitting on technical aspects is appropriated by replacing and adding components that proper to the current condition. Assesment of techno economic indicators use cash flow method that covering NPV (net present value), PBP (payback periode), BCR (benefit cost ratio), IRR (internal rate of return) dan LCOE (levelized cost of energy).The analysis of techno-economic has been carried out that is continued by analyzing potential sustainability from micro hydropower plant. The potential sustainability indicator assessment had been proposed by Ilskog and Afifah. The research results show that micro hydropower plant Blimbing was feasible in technical aspect by improving to the technical aspects. However, economic feasibility analysis of 1A and 1B scenarios were unfeasible. On the other hands, the feasibility analysis scenarios of 2A and 2B were feasible. The assessment of potential sustainability in this research considers four dimensions. There are technique, economics, environment and social-institution. Every dimension has indicators that are determined. Among the four dimensions sustainability, the lowest value of potential sustainability is the social-institution dimension that is 26,67%. The low result of potential sustainability in social institution is caused of organization management and electric utilization from micro hydropower plant.*

*Keyword: screw turbine, sustainability indicator, retrofit, micro hydropower plant*