

## ABSTRAK

Saat ini *Solar Photovoltaic* mulai berkembang di Indonesia, namun masih dalam bentuk mini grid dan tersebar di berbagai wilayah, terutama di wilayah terpencil yang selama ini menggunakan pembangkit listrik tenaga diesel (PLTD) sebagai upaya untuk melakukan efisiensi dan menurunkan biaya produksi listrik. Laporan teknik ini membahas tentang pengembangan potensi Energi Baru Terbarukan (EBT) di Indonesia dengan melakukan kajian tekno-ekonomi dari pembangunan *solar floating photovoltaic* yang terhubung ke jaringan interkoneksi Jawa-Bali. *Solar floating photovoltaic* yang berlokasi di waduk Cirata, Purwakarta tersebut memiliki kapasitas 145 MW dan terhubung ke sub sistem pusat tegangan 150 kV Cirata. Penelitian ini dimulai dengan melakukan perhitungan kapasitas potensi sinar matahari di cirata adalah 4.5 kWh/m<sup>2</sup>, dan mampu menghasilkan energi listrik harian rata-rata 696,556.80 kWh/day dengan perkiraan *capacity factor* 16,32%. Selanjutnya, untuk menghitung nilai kelayakan investasi dikumpulkan data terkait *project cost* dan biaya-biaya yang diperlukan dalam pembangunan *solar floating photovoltaic* ni. Adapun *project cost* yang dibutuhkan sebesar USD 106,250,731 dengan skema struktur pendanaan 80% dari *project cost* didanai oleh Bank. Hasil perhitungan keekonomian proyek menemukan bahwa biaya pokok produksi listrik yang dihasilkan pada pengembangan *solar floating photovoltaic* sebesar 5,8 cUSD/kWh dengan simulasi *cash flow report project*, pembangunan *solar floating photovoltaic* mampu menghasilkan *Net Present Value* (NPV) USD 23,639,065, *Internal Rate Return* (IRR) 12%, *Benefit Cost Ratio* (BCR) 1.14, dan *payback period* sebesar 12 tahun.

Kata kunci: *Photovoltaic, Capacity Factor, NPV, IRR, BCR, Payback Period*

## ABSTRACT

Currently Solar Photovoltaic is starting to develop in Indonesia, but it is still in the form of a mini grid and is spread in various regions, especially in remote areas that have been using diesel power plants (PLTD) as an effort to make efficiency and reduce electricity production costs. This technical report discusses the potential development of New Renewable Energy (EBT) in Indonesia by conducting a techno-economic study of the construction of solar floating photovoltaic connected to the Java-Bali interconnection network. The solar floating photovoltaic located in the Cirata reservoir, Purwakarta has a capacity of 145 MW and is connected to the Cirata 150 kV central sub-system. This research begins by calculating the potential capacity of sunlight in Cirata is 4.5 kWh/m<sup>2</sup>, and is able to produce daily electrical energy an average of 696.556.80 kWh/day with an estimated capacity factor of 16.32%. Furthermore, to calculate the value of investment feasibility, data related to project costs and costs required for the construction of this solar floating photovoltaic are collected. The project cost required is USD 106,250,731 with a funding structure scheme of 80% of the project cost funded by the Bank. The results of the project's economic calculations found that the cost of electricity produced in the development of solar floating photovoltaic was 5.8 cUSD/kWh with a cash flow report project simulation, the construction of solar floating photovoltaic was able to generate a Net Present Value (NPV) of USD 23,639.065, Internal Rate Return (IRR) 12%, Benefit Cost Ratio (BCR) 1.14, and a payback period of 12 years.

Keywords: Photovoltaic, Capacity Factor, NPV, IRR, BCR, Payback Period