## ABSTRAK

Menganalisis pengaruh penggunaan lensa Fresnel dan cermin datar (*Reflector*) terhadap daya keluaran panel surya jenis monokristalin. Pengukuran dilakukan di laboratorium Teknik Elektro Universitas Negeri Medan selama 10 hari dengan data diambil dari pukul 10:00 hingga 17:00 WIB setiap 30 menit. Hasil penelitian menunjukkan bahwa lensa Fresnel dan cermin datar secara signifikan meningkatkan intensitas radiasi matahari yang diterima panel surya. Rata-rata solar radiasi yang dihasilkan dengan lensa Fresnel adalah 865,56 W/m² dan dengan cermin datar sebesar 803,39 W/m², dibandingkan dengan panel tanpa perlakuan sebesar 701,10 W/m². Meskipun demikian, terdapat perbedaan efisiensi antara kedua alat optik tersebut, di mana efisiensi tertinggi diperoleh dengan penggunaan cermin datar pada sudut kemiringan optimal. Penelitian ini memberikan wawasan tentang potensi peningkatan efisiensi panel surya melalui penggunaan alat optik, serta pengaruhnya terhadap suhu dan daya keluaran panel surya.



**Kata Kunci** : Lensa Fresnel, cermin datar, panel surya, monokristalin, efisiensi energi.

## *ABSTRACT*

*Analyzing the effect of using Fresnel lens and flat mirror (Reflector) on the output power of monocrystalline type solar panel. Measurements were taken at the Electrical Engineering Laboratory of Medan State University for 10 days with data taken from 10:00 am to 5:00 pm every 30 minutes. The results showed that the Fresnel lens and flat mirror significantly increased the intensity of solar radiation received by the solar panel. The average solar radiation generated with the Fresnel lens was 865.56 W/m² and with the flat mirror was 803.39 W/m², compared to the untreated panel of 701.10 W/m². Nonetheless, there was a difference in efficiency between the two optical devices, where the highest efficiency was obtained with the use of a flat mirror at the optimal tilt angle. This research provides insight into the potential for increasing the efficiency of solar panels through the use of optical devices, as well as their effect on the temperature and output power of solar panels.*



***Keywords**: Fresnel lens, flat mirror, solar panel, monocrystalline, energy efficiency.*