

## ABSTRAK

### RANCANG BANGUN PANEL TRAINER SISTEM PEMBANGKIT LISTRIK TENAGA SURYA *HYBRID* TERINTEGRASI TURBIN ANGIN SEBAGAI MEDIA PEMBELAJARAN

(2026: xvii + 67 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

---

---

**Bagas Harry Murti**

**062330310465**

**Jurusan Teknik Elektro**

**Program Studi DIII Teknik Listrik**

**Politeknik Negeri Sriwijaya**

Penelitian ini bertujuan merancang dan membangun panel trainer sistem pembangkit listrik tenaga surya *hybrid* terintegrasi turbin angin sebagai media pembelajaran energi terbarukan. Metode penelitian meliputi studi pustaka, perancangan, perakitan, dan pengujian sistem. Panel trainer terdiri dari dua panel surya dengan total kapasitas 200 Wp, turbin angin, *Wind Solar Charge Controller* (WSCC), baterai LiFePO<sub>4</sub> 12 V 15 Ah, *inverter* 500 W, wattmeter digital, dan sistem proteksi MCB. Hasil pengujian menunjukkan bahwa sistem mampu melakukan pengisian baterai melalui panel surya, turbin angin, maupun kombinasi keduanya. Pada mode panel surya diperoleh tegangan dan arus pengisian sebesar 13,16 V dan 0,57 A, pada mode turbin angin sebesar 13,04 V dan 0,25 A, serta pada mode *hybrid* sebesar 13,21 V dan 0,83 A. Selain itu, panel trainer mampu menyuplai beban AC dan DC serta dapat digunakan sebagai media pembelajaran praktikum energi terbarukan.

**Kata Kunci:** Panel Trainer, Sistem *Hybrid*, Panel Surya, Turbin Angin, Energi Terbarukan.

## ***ABSTRACT***

### ***DESIGN AND DEVELOPMENT OF A SOLAR POWER GENERATION SYSTEM TRAINER PANEL INTEGRATED WITH A WIND TURBINE AS A LEARNING MEDIA***

*(2026: xvii + 67 Page + List of Pictures + List of Tables + List of Appendix)*

---

---

**Bagas Harry Murti**

**062330310465**

***Departement of Electrical Engineering***

***DIII Electrical Engineering Study Program***

***Sriwijaya State Polytechnic***

*This study aims to design and develop a hybrid solar power plant trainer integrated with a wind turbine as a renewable energy learning medium. The research method consisted of literature study, system design, assembly, and testing. The trainer was equipped with two solar panels with a total capacity of 200 Wp, a wind turbine, a Wind Solar Charge Controller (WSCC), a 12 V 15 Ah LiFePO4 battery, a 500 W inverter, a digital wattmeter, and Miniature Circuit Breaker (MCB) protection devices. The testing results showed that the system was capable of charging the battery using solar energy, wind energy, and a combination of both sources. In solar mode, the charging voltage and current were 13.16 V and 0.57 A, respectively; in wind mode, 13.04 V and 0.25 A; and in hybrid mode, 13.21 V and 0.83 A. Furthermore, the trainer successfully supplied AC and DC loads and can be utilized as a practical learning medium for renewable energy systems.*

***Keywords:*** *Trainer Panel, Hybrid System, Solar Panel, Wind Turbine, Renewable Energy.*