ABSTRAK

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Program Studi : Teknik Elektro
Judul : Perencanaan Pemanfaatan PLTS *On Grid* Sebagai Sumber Energi Untuk *Charging Station* Kendaraan Listrik
Dosen Pembimbing : Ir. Sudirman Palaloi, M.T.

Perkembangan kendaraan listrik berbasis baterai semakin berkembang dan jumlahnya semakin banyak di dunia, terutama di negara maju. Namun untuk mengurangi emisi gas rumah kaca dan mendapatkan manfaat kualitas udara secara keseluruhan maka dibutuhkan campuran sumber pembangkit yang berasal dari PLTS ke *grid* yang digunakan untuk mengisi daya mereka. Dalam tulisan ini telah dibuat suatu perencanaan pemanfaatan PLTS *On Grid* sebagai sumber energi *charging station* kendaraan listrik. PLTS *On Grid* yang dirancang mempunyai kapasitas 5,9 kWp di pasang di area atap rumah. Berdasarkan hasil perencanaannya, pemasangan PLTS di atap rumah mempunyai luas 45 m^2, Komponen pada PLTS ini menggunakan panel surya jenis *polycrystalline* merek CANADIAN SOLAR'S kapasitas 330 Wp sebanyak 18 unit. Konfigurasi panel surya dirangkai dengan 2 *array*, masing- masing *array* terdapat 2 *string* yang diseri sebanyak 9 unit. *Inverter* yang digunakan yaitu merek GOODWE SDT G2 SERIES tipe GW6K-DT kapasitas 6 kW. Dengan menggunakan perencanaan ini maka jumlah rata-rata energi yang dihasilkan oleh PLTS di atap rumah yaitu 27,67 kWh/hari. Perangkat daya yang digunakan untuk mengisi baterai kendaraan listrik menggunakan merk DELTA AC MAX dengan kapasitas maksimal 11 kW. Untuk memenuhi perencanaan tersebut maka dibutuhkan nilai investasi sebesar Rp.114.893.800. Berdasarkan hasil perhitungan, biaya balik modal didapatkan di tahun ke 19 dari umur proyek 25 tahun.

Kata kunci: PLTS, Perencanaan, Kendaraan Listrik, Panel Surya, Pengisian Daya.

ABSTRACT

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Study Program : *Electrical Engineering*
Title : *Planning for the Utilization of PLTS On Grid as an Energy Source for Charging Stations for Electric Vehicles*
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The development of battery-based electric vehicles is growing and the number is increasing in the world, especially in developed countries. However, in order to reduce greenhouse gas emissions and gain overall air quality benefits, it is necessary to mix generation sources from PV mini-grid to the grid used to charge them. In this paper, a plan for the use of PLTS On Grid has been made as an energy source for charging stations for electric vehicles. PLTS On Grid which is designed to have a capacity of 5.9 kWp is installed on the roof area of the house. Based on the results of the plan, the installation of PLTS on the roof of the house has an area of 45 m2. The components in this PLTS use polycrystalline solar panels of the CANADIAN SOLAR'S brand with a capacity of 330 Wp as many as 18 units. The configuration of the solar panels is arranged with 2 arrays, each array contains 2 strings which are in series as many as 9 units. The inverter used is GOODWE SDT G2 SERIES brand type GW6K-DT with a capacity of 6 kW. By using this plan, the average amount of energy produced by PLTS on the roof of the house is 27.67 kWh/day. The power device used to charge electric vehicle batteries uses the DELTA AC MAX brand with a maximum capacity of 11 kW. To fulfill this plan, an investment value of Rp.114,893,800 is needed. Based on the calculation results, the cost of return on investment is obtained in the 19th year of the 25-year project life.

Keywords: PLTS, Planning, Electric Vehicles, Solar Panels, Charging.