

ABSTRACT

Currently, Indonesia is entering a transition period from vehicles that use fossil fuels (BBM) to electric-powered vehicles. This is due to the fact that fossil fuel-powered vehicles produce carbon emissions during their combustion process, which is harmful to the environment. In contrast, electric vehicles tend to produce minimal carbon emissions, thus reducing the dangerous CO₂ emissions by up to 50%. Therefore, this research will discuss the electric supply system for Public Electric Vehicle Battery Replacement Stations (PEVBRS) while considering aspects of adequacy, quality, reliability, security, and stability in order to achieve an appropriate electric supply. The design of the hybrid electric supply system is carried out using the DIGSILENT software. Testing is conducted through three methods: load flow, short circuit, and stability testing on the electric supply system during daytime operation (PLN mode), nighttime operation (PLN mode), and hybrid operation mode. Based on the conducted tests, the research results indicate that the designed electric supply system meets only three of the criteria, except for security and stability. As a result, the electric supply system design is not yet perfect and not suitable for direct application.

Keywords: Electric Supply System, Electric Vehicle, PEVBRS