Park Model using Concentrated-Solar-Power Photovoltaics

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Abstract
The energy harvesting system called the CSP otherwise known as the Concentrated Solar Power, are being used to supply energy in a large scale, where the system is being placed in an open, dry, and unclouded area. However, using this system in an urban area still has not been done, as of right now. This project demonstrates a model of an eco-park that uses concentrated solar power onto a set of photovoltaics as its main source of energy, in this case specifically for the lighting. The solar panels are mounted on a pillar that is standing on a platform in the middle of the park surrounded by reflectors, which reflects the sunlight to the panels in order to harvest more energy from the sun. The electricity collected from the panels is then connected to a circuit that combines the cabling from the solar panels, which is then connected into a power bank to charge. And lastly to another circuit which distributes the electricity to the lights around the model. This CSP photovoltaics system is aimed to provide an effective way of mounting solar panels in a vertical orientation as opposed to the conventional horizontal orientation as rooftops. Vertical mounting of solar panels is more space efficient but requires a CSP to provide better access to sunlight over the course of the day. By incorporating this system in an urban setting, especially in under-developed countries such as Indonesia, it is hoped that a cleaner and cheaper energy access can be available.

Keywords
Photovoltaics, Alternative Energy, Environmental Science, Solar Panels, Energy Harvester

Biographies

Darren Johanes Manua is a 10th grade student studying in Sekolah Pelita Harapan in Tangerang, Banten.

Eden Steven is the director of SPH Applied Science Academy at Sekolah Pelita Harapan Lippo Village in Indonesia, a research based after school program for students with passion and talents in science and engineering fields. He obtained his Ph.D. in Physics from Florida State University working on diverse topics related to biomaterials such as spider silk and advanced electronics such as organic conductors, semiconductors, and superconductors. He has published more than 25 international journal articles with two Nature affiliated journal publications. In addition to pioneering a high school research-based program at Sekolah Pelita Harapan, he also founded a research laboratory in Jakarta, Indonesia with the vision to catalyze the research environment of the nation. He is excited and inspired by the IEOM committee and community in how they care about the future of science and technology through the supporting of the research community

