STANDALONE SOLAR PHOTOVOLTAIC MODULE PERFORMANCE MONITORING TEST-BED SYSTEM

NGEE ANN POLYTECHNIC

COLLABORATION WITH:

NUS National University of Singapore | SERIS Solar Energy Research Institute of Singapore

PROJECT BY:

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Diploma in Electrical Engineering I Year 3

PROJECT OBJECTIVE

The aim of this project is to serve as a test-bed for monitoring and testing the performance of different types of solar photovoltaic (PV) modules under all weather conditions. This prototype test-bed setup enables it to function as a standalone and portable system which collects and transmits data for NUS' SERIS Central Monitoring System (CMS). The rapid development in solar module technologies/manufacturing requires a robust testing system under real-life conditions. The system can monitor real-time data and collect both weather and electrical parameters of the solar PV module for performance benchmarking. Data storage on the cloud server is also available for ease of data analysis.

PROJECT SUMMARY

This is a joint collaboration between NUS SERIS and Ngee Ann Polytechnic School of Engineering. An embedded hardware controller is used in this project, with external lead-acid batteries, Maximum Power Point Tracker (MPPT) and solar irradiance sensors being the other key components of this project. This project considers different types of solar PV modules to be simultaneously tested in different outdoor environments to determine output performance. This test-bed is scalable for future expansion and commercialisation.

PROJECT OUTCOMES

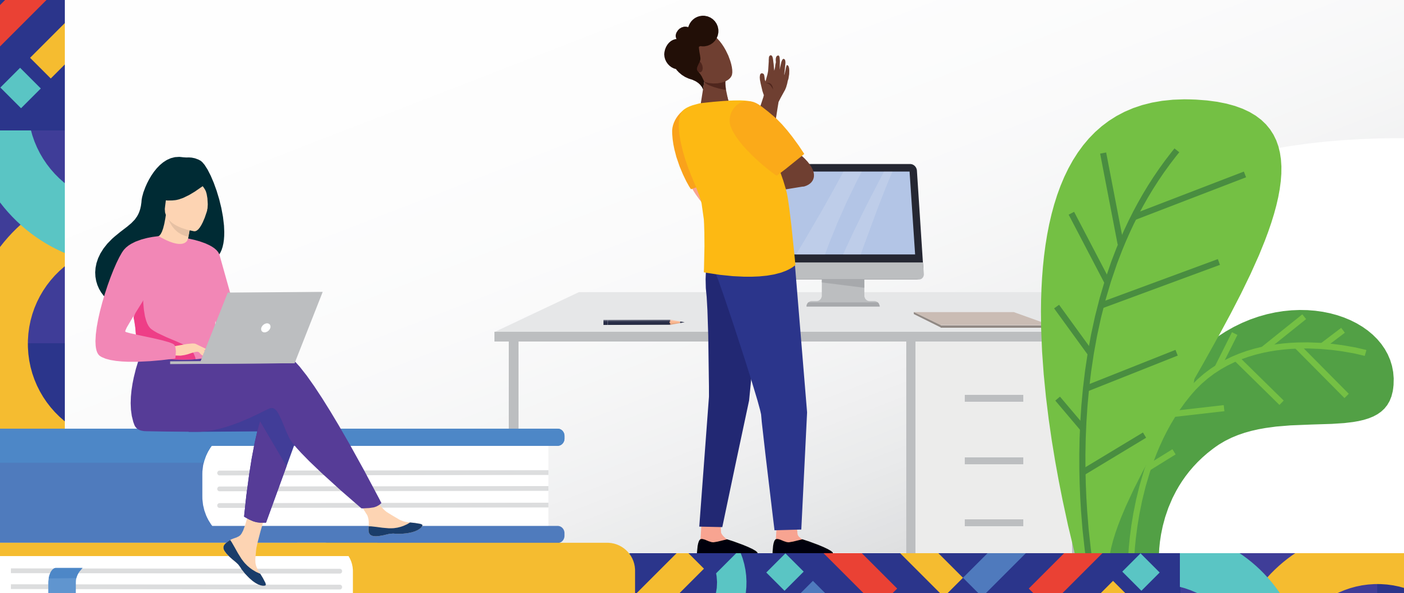
The following are the key tangible outcomes:

- Cloud-based data collection of different solar PV modules' performance for analysis to determine output performance.
- An off-grid, standalone portable deployable monitoring system at any outdoor location.

USER INTERFACE FOR MONITORING CONDITION OF HARDWARE ON-SITE WITH REAL-TIME DATA COLLECTED

SOLAR PV SET UP

SCAN TO VIEW VIDEO



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