

18 kW Experimental PV Array Monitoring Facility Established at the ASU Research Park

An 18kW facility was developed at the ASU Research Park, AZ (Fig.1), scheduled to begin operations in October 2015. The comprises hardware, software and several related pieces of equipment to create a state-of-the-art utility-scale solar panel array testing facility that will be used for research and education endeavors. The SMDs connected to each PV panel (Fig. 2 and 3) collect the individual panel metrics (current, voltage, and temperature) periodically (about every 8 seconds), and cameras will be used to collect data at 20-30 frames per second. The collected information is transmitted to a central server and the cloud, which stores measurements of panel, image and weather data. The data consists of measurements of irradiance, wind and atmospheric temperature, and is obtained from a locally installed weather station. An algorithmic and data analysis unit will be equipped with the algorithms for identifying and tracking various important time-varying events and patterns that are developed as a part of this GOALI project. Our GOALI partner ViaSOL helped design the experimental facility (Fig. 4).



Fig. 1. ASU Research Park in Tempe. aka Micro Technology Works (MTW). Area in blue is where the Solar panels were installed. 104 panels were installed as shown in Fig. 2.



Fig. 2 104 (8x13) Solar Panels installed producing roughly a total of 18kW. Each panel can be monitored individually and all data is transmitted to a server. These panels are already installed in the area of Fig.1 marked with a blue rectangle. The facility will become operational in Oct. 2015 after all communications hardware infrastructure is finalized.



Fig. 3. Prototype sensors and communications hardware for intelligent Networked Array Monitoring. These sensors monitor irradiance, temperature, voltage, current and have hardware to enable local and cloud computing and communications capabilities.



Fig. 4. Personnel from our GOALI partner ViaSOL inspecting the facility in June 2015.