Phase 3 Statement Theme   Sustainability and Resilience
Statement number   1
Launch Date   15 September 2020
Closing Date for submission 26 October 2020

Title	Defect Detection for Solar Panels deployed on building Rooftops or Interim Land
Background	JTC and Whole-of-Government (WOG) are deploying solar panels in suitable spaces in Singapore, hence with the wide-scale deployment, being able to detect defective panels effectively will allow JTC to ensure optimised renewable energy generation and minimise any risks from defective electronics.
Challenges	Solar farms have a large area and solar panel fault identification currently requires manual scanning. Manual scanning of panels at an angle makes it difficult to detect faults and would not be able to identify hotspots. This process is labour intensive and can have a long reaction time between fault identification and rectification. New technologies has emerged to use thermal cameras to identify defects, which are mainly hotspots and bypass diode failure. However thermal cameras are not adequate at identifying defects such as Potential Induced Degradation (PID), cell cracks corrosion , de-lamination etc which can affect a solar farm's performance. There exist much data for a solar plant (string data, combiner box data, power generation, images etc) lies opportunities for analytics platform to provide quick and accurate diagnostics of the issues on hand in the solar plant. However, such system, particularly that of predictive analysis, are often under-developed and under-utilised in the solar industry,
Desired Outcomes	Technologies/systems that can accurately and quickly identify a variety of defects, such as PID, cell cracks, corrosion, bypass diode failure, etc in solar plants, and flag out fault conditions and generate reports is a possible solution to mitigate such a challenge. The solution will shorten the time needed to identify problem areas in solar installations and enable solar plants to improve plant yield and increase safety of operation and maintenance.
Requirements	1. Not limited to the method of scanning the solar farm, the proposed system to detect defects and faults should be low-cost and the process should be completed within a short period of time accurately ; 2. Methods proposed should capture conditions of defects and it must be georeferenced; and 3. Data analytics to predict potential panel failures.
Possible Solutions	Scanning solutions: Electroluminescence/MRI/Fluorescent or other state-of-the-art solution camera analytics. Analytic platform: Plant data diagnostic platform that allows JTC and end user to process data and identify (potential) defects in PV plants
Development Time frame	*(see table below)*

Description of Task	Estimated Duration (Months)	Target Start Date	Target End Date
Project kick off	-	Start date (N)	

	Hardware procurement /integration	6	N	N + 6
	Cloud based server set-up	6	N	N + 6
	Demonstration	6	N + 6	N + 12
	Final report generation	3	N + 9	N + 12
	Total project period duration shall not exceed 12 months.			
Additional Info	NIL			