

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	<p>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.</p> <p>New technologies has emerged to use thermal cameras to identify defects, which are mainly hotspots and bypass diode failure. However thermal cameras are unable to identify other defects such as Potential Induced Degradation (PID), cracks and de-lamination, which can affect a solar farm’s performance.</p>																										
Desired Outcomes	Technologies/systems that can accurately and quickly identify a variety of defects, such as hot spots, cracks or PID 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	<ol style="list-style-type: none"> 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	<p>Scanning solutions: Electro-luminous camera analytics.</p> <p>Analytic platform: Management system that allows JTC and end-user to process data and identify (potential) defects in Photovoltaic plants.</p>																										
Development Time frame	<table border="1"> <thead> <tr> <th>Description of Task</th> <th>Estimated Duration (Months)</th> <th>Target Start Date</th> <th>Target End Date</th> </tr> </thead> <tbody> <tr> <td>Project kick off</td> <td>-</td> <td>Start date (N)</td> <td></td> </tr> <tr> <td>Hardware procurement /integration</td> <td>6</td> <td>N</td> <td>N + 6</td> </tr> <tr> <td>Cloud based server set-up</td> <td>6</td> <td>N</td> <td>N + 6</td> </tr> <tr> <td>Demonstration</td> <td>6</td> <td>N + 6</td> <td>N + 12</td> </tr> <tr> <td>Final report generation</td> <td>3</td> <td>N + 9</td> <td>N + 12</td> </tr> </tbody> </table> <p>Total project period duration shall not exceed 12 months.</p>			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
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																								

Additional Info	NIL
------------------------	-----