

## SOLAR PANEL ON-SITE LABORATORY TESTS

RES recommended that the owner of a 7 MWp solar farm in the South West of England tested the panels before the 24 month warranty period ended. This would ensure free replacements were obtained if necessary. It was also to verify the accuracy of panel power rating and degradation status before it started to cause energy yield loss.

A random sample of 200 solar modules were selected. Using an on-site laboratory meant that a large number of panels could be efficiently tested in one day, without the risk of transport or mishandling damage. A number of contractors fail to understand the fragility of panels. The test provides clear evidence for a warranty claim.

The procedure was carried out using an on-site mobile laboratory - valuable not only to prevent damage but it can be mobilised during poor weather to avoid tests being carried out during times of optimum generation.

### TESTS INCLUDED THE FOLLOWING:

- » Visual inspection to determine the condition of the panel.
- » Standard Test Condition Power Management: The modules were flash tested with a calibrated light source and electrical output and power measured with a tolerance of  $\pm 3$ , according to IEC60904. Flash results are measured against the manufacturer's warranty.
- » Electro Luminescence (EL) test: Detects possible damages within the solar cell itself. Certain crack types can cause critical performance loss. The test displays how well the panel is functioning and uncovers hidden micro cell cracks. Potential Induced Degradation (PID) is a good example of a hidden problem which can be easily detected through EL tests.

Generally the modules tested are performing well. Results showed 39 solar modules with micro-cracks in solar cells. These were classified as minor defects with no critical cell cracks and no impact on the module performance. One solar module was classified as critical defect with a power loss of more than 10% caused by Potential Induced Degradation (PID) and was replaced. It was recommended to the owner that a similar test is carried out in two years' time to confirm power loss degradation is limited to below 10%, in order to maintain asset value.

### ABOUT US

RES (Renewable Energy Systems) has developed and/or built over 13 GW of renewable energy capacity worldwide and support an operational portfolio of assets exceeding 3 GW. RES is active in a range of energy technologies including onshore & offshore wind, solar, energy storage and transmission & distribution.

### CALL TO FIND OUT HOW WE CAN HELP MAINTAIN ASSET VALUE

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A rapid but intensive test during periods of low generation.

On-site testing ensures there is no further panel damage.

