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Intersolar: Photovoltaik-Institut Berlin introduces new error analysis method for PV power plants

Economic high-volume, on-site electroluminescence measurements now available for the first time

The Photovoltaik-Institut Berlin (PI Berlin) has developed a new, automated process that allows solar modules to be examined without being dismantled, thereby reducing analysis time. Up to 1,000 modules can be tested each night using electroluminescence measurements (EL). Specially developed software then analyses the test images and provides information on measures required to resolve faults and modules that need replacing. Experts at PI Berlin have already put this method into practice for Deutsche Bank, for example, which uses it as a basis for its power plant assessments.

“If a PV power plant generates lower yields than expected, we start looking for potential errors. The quicker the error is found, the higher the profits will be for investors and operators. Our test set-up allows us to take high-resolution electroluminescence images of several modules at once, thus saving time,” explains Dr Juliane Berghold, Head of Module Technology and Research at PI Berlin. “These images are then analysed and automatically evaluated by our software, which is based on our years of experience with error analysis of PV modules in power plants. This expertise also helps us to evaluate these results very quickly and recommend specific courses of action for solving problems in the plant.”

Each examined module is classified in a test report, allowing defective modules to be localised and replaced in the event of damage. Test reports help investors and operators to back up their claims to EPC contractors, module manufacturers and insurers.

Error analysis for investors

PI Berlin used this new test method to examine a power plant in Italy that had been generating significantly lower yields than expected immediately after start-up. Engineers at the institute tested over 12,000 installed polycrystalline modules in less than three weeks – over 80 percent were shown to be defective. Many were found to have badly fractured cells in the centre, which were considerably reducing yield. PI Berlin’s report prompted the investor to have several thousand solar modules replaced.

“Our analyses show that PV modules are frequently damaged during transportation. This is indicated, for example, by prominent cell fractures that occur fairly consistently in the middle of the majority of modules in a plant. In such cases, the damage we see in the power plant can be attributed to a combination of the transportation method and relatively

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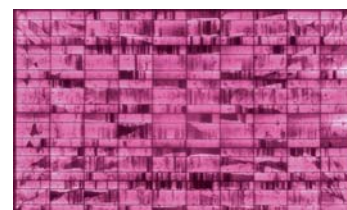
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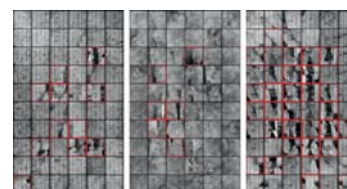
http://www.pi-berlin.com/el-test.html



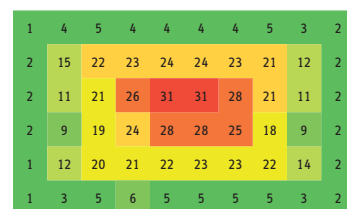
Modules are supplied with current at night for electroluminescence tests



EL images highlight inactive cell areas in solar modules



Major cell fractures are marked in red



Statistical evaluation shows an increased concentration of cell fractures in the middle of the modules

sensitive modules,” reports Dr Berghold. After performing error analyses, PI Berlin is often commissioned again to examine the quality of the replacement modules and thus ensure that the power plant is working at full capacity.

PI Berlin will present the new test method and other analysis processes at **Intersolar Europe** in Munich, Germany from 10th–12th June 2015.

Intersolar exhibition booth: Hall A1, Booth 451

Interview opportunities at the exhibition: Dr Juliane Berghold, head of module technology and research at PI Berlin, is available for interviews at the exhibition.

About PI Berlin

The Photovoltaik-Institut Berlin provides independent, expert advice on designing, constructing and operating PV power plants worldwide. With its experienced team of researchers and engineers, the institute offers a wide range of design and test services with a focus on quality assurance in complex PV projects. PI Berlin has already provided support for projects with a total rated output of over two gigawatts (GW) worldwide.

The institute also has an IEC-accredited test laboratory at its Berlin site for checking the performance, reliability and resistance of solar modules. Another test laboratory is located in Suzhou, China.

The institute was established nine years ago by PV experts Prof. Dr Stefan Krauter, Sven Lehmann and Paul Grunow, who was also one of the founders of Solon and Q CELLS.

www.pi-berlin.com



Examined PV power plant in Italy



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PI Berlin engineer inspects PV power plant



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