Area: PV Systems Including BOS Components

PV MODULE REUSE&RECYCLING BUSINESS
AND MODULE DEFECTS IN THE FIELD

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The Japanese photovoltaic (hereinafter referred to as “PV”) market has grew rapidly due to the introduction of feed-in-tariff and massive End-of-life (hereinafter referred to as “EOL”) modules are expected to be discarded in the future. According to the Japanese Ministry of Environment, the number of discarded PV modules are said to be approx. 800,000 tons in 2040. Under such situation, we have been conducting R&D of PV module recycling processes utilizing the company’s PV manufacturing equipment technology since 2014. In addition, we established “PV Techno Cycle Incorporated” in August 2016 which has been moving toward early roll-out of reuse/recycling of PV modules to solve the problem of massive discarded modules in the future. As shown in Figure 1, we have been developing PV module disassembly equipment which enables the separation of aluminum frames, glass and cell/EVA without crushing the glass or the cells under the NEDO project.

The future massive discarded modules are not only consisted of EOL modules, but also of defected modules and damaged modules by natural disaster. In terms of defected modules in the field, we have started providing PV system field inspection services and devices such as I-V tracer and EL/PL inspection machine, utilizing our technology of inspection machines to contribute to the healthy growth of the Japanese PV market. So far, we have inspected 135 plants, in total more than 500MW in Japan.

We have accumulated the inspection results showing the performance of PV modules in the field. We found out that approx. 54% (as of August 31, 2017), which means more than a half of the PV plants inspected showed some kind of performance trouble caused by the PV modules itself. Such causes include disconnected ribbon/interconnectors, BPD short circuit fault, soldering failure of ribbon/interconnectors and so on. Furthermore, the PV plants which we inspected are not plants which started operation 10-20 years ago but are very young plants of around 2-3 years operation time. Therefore it is necessary to conduct appropriate operation and maintenance in order to maintain the PV module performance.

Figure 1: Major solution for PV module recycling