



Advisory: Applied Materials Reports Significant Advances in PV Technologies at PVSEC

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- **18.4% cell efficiency achieved in back-contacted crystalline silicon cells**
- **>10% conversion efficiency in thin film silicon modules for utility scale applications**
- **Factory automation systems boost solar manufacturing productivity**

VALENCIA, Spain, Sep 05, 2010 (BUSINESS WIRE) --

Applied Materials, Inc., the world's largest equipment supplier to the solar photovoltaic (PV) industry, will highlight its latest technology advances in PV at the 25th European Solar Energy Conference and Exhibition ([EU PVSEC](#)) this week in Valencia, Spain. Applied will present innovative developments for the PV factories of the future - from higher efficiency crystalline silicon and thin film technology, to smart automation systems to boost manufacturing productivity and yield.

New Crystalline Silicon Cell Architectures

In addition to sharing advances in double printing and high-speed, multi-cell deposition techniques, Applied will report its latest results in emitter wrap-through (EWT) technology, where all contacts are placed at the back of the cell. Using EWT cell architecture with p-type wafers, single-crystal silicon and proven manufacturing processes, Applied has achieved 18.4% cell efficiency on large area cells in R&D testing. In addition to providing higher conversion efficiency, back contacts lend themselves to new, automated module assembly techniques which eliminate the complex and error-prone task of stringing cells together. Process results using this technique, called monolithic module assembly (MMA), have shown encapsulation losses of less than 1%, demonstrating the robustness of this high-efficiency, module fabrication technique.

Demonstrating High-Efficiency Thin Film Modules for Utility-Scale PV

Applied continues to advance thin film silicon technology, which remains a leading candidate for utility-scale solar power plants due to its superior light harvest and lower installation costs. Applied's technologists will share the key techniques that produced a milestone of greater than 10% conversion efficiency on 1.4m² panels - which extrapolates to greater than 10.5% efficiency on 5.7m² panels. In addition, Applied will present data from two studies in Arizona and Singapore. These studies demonstrate a large, 8% improvement in energy yield over crystalline silicon modules under real-world conditions - which translates to significant reductions in electricity cost over the lifetime of the panels. The combination of >10% efficiency, lower production cost, higher energy yield and lower installation costs will enable Applied's current and future customers to achieve the lowest cost per kWh for utility scale installations.

Automation for the PV factory of the future

Applying its expertise in automating semiconductor fabs, Applied has developed a comprehensive range of "smart" control systems that can help cell makers to realize significantly higher productivity than current factory layouts while adding flexibility and enabling higher product quality. These systems include the [SmartFactory\(TM\)](#) manufacturing execution system software, an affordable, out-of-the-box factory automation solution that streamlines the flow of materials throughout a facility. The software, which can be deployed in less than 60 days, features pre-configured workflows for PV manufacturing and is easily scalable as business needs expand. Applied also offers E3(TM) technology, which interfaces directly with production equipment, enabling real-time, run-to-run process turning and fault detection to increase process capability and reduce unplanned downtime. The benefits of advanced factory automation can also be applied to current production facilities, delivering significant increases in productivity and process capability without additional capital expenditure.

Global Support for Global PV Manufacturing

As solar manufacturers ramp capacity and establish facilities in geographically diverse areas, it becomes challenging to keep those facilities operating at peak performance with tightly-matched output. Currently supporting over 1,800 crystalline silicon systems at more than 200 customer sites worldwide, Applied Global Services has a deep global infrastructure to help its customers meet those challenges with an unmatched range of service technologies including spare parts management, component refurbishment and advanced systems support - including on-demand and internet remote diagnostic support.

For more information on Applied's participation in PVSEC 2010, please visit www.pvsecapplied.com where you can find full details of Applied's more than 15 paper presentations, plus videos and media resources.

Applied Materials, Inc. (Nasdaq:AMAT) is the global leader in Nanomanufacturing Technology(TM) solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass. At Applied Materials, we apply Nanomanufacturing Technology to improve the way people live. Learn more at www.appliedmaterials.com.

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