

# Global and China Solar Cell (Photovoltaic) Equipment Industry Report, 2010

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## Abstracts

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The equipment expenditure of the thin film photovoltaic cell industry is much higher than that of traditional crystalline silicon photovoltaic cell industry. With the decline of the polysilicon price since H2 2008, the advantages of thin film photovoltaic cells in low-cost raw materials have become less impressive. Many manufacturers have become extremely cautious about or even stopped investing in the field of thin film photovoltaic cells, resulting in the decline of PV equipment industry. But, Chinese manufacturers of crystalline silicon photovoltaic cells have improved capacity significantly in 2010 to offset the decline of thin film photovoltaic cell equipment.

In H2 2010, the polysilicon price began to soar. It's expected that manufacturers may increase the investment in thin film photovoltaic cells, but obviously, the polysilicon price will not skyrocket as in 2008. Therefore, people are still cautious about thin film photovoltaic cells.

Compared with traditional energy technologies, photovoltaic cell, especially thin film photovoltaic cell, still has lower conversion efficiency, which is a theoretical defect that cannot be removed within 5 to 10 years. PV industry has relatively strong dependence on policies, but many countries will cut government spending and subsidies to reduce their deficits. With rich experience accumulated in the development from 2006 to 2010, PV equipment has already been quite mature. In addition, as many new entrants offer low prices, the unit price has fallen a lot. As a result, PV equipment industry will only see a moderate instead of explosive growth in the future.

Applied Materials is the largest semiconductor equipment manufacturer, the second largest TFT-LCD equipment manufacturer and the largest PV equipment manufacturer in the world. Among various types of PV equipment, PECVD is the most expensive. Applied Materials takes a dominant position in PECVD market, with nearly 90% market share. At the end of July 2010, Applied Materials reorganized its Energy and Environmental Solutions (EES) Division which suffered successive operating deficits. The primary business of EES Division is PV equipment. After the reorganization, the company will dispose of Turnkey Solution business which provides complete thin film silicon solar cell production lines, and turn to crystalline silicon solar cell and LED business. In the field of PV equipment, Applied Materials also has strong advantages in wafer cutting equipment, due to its acquisition of Swiss wafer cutting company HCT Shaping Systems for USD475 million in 2007.

Oerlikon is committed to thin film PV equipment. Its performance suffered a substantial decline in H1 2010. The order value fell from SEK497 million in H1 2009 to SEK11 million in H1 2010, down 98%. Japan's ULVAC, also engaged in thin film PV equipment, has the same experience. Fortunately, ULVAC is also the world's largest TFT-LCD equipment manufacturer, and PV equipment only holds a small share in its business.

Centrotherm has the most complete product lines and advanced PECVD technology. Its clients are concentrated in Asia, especially Taiwan. Taiwanese Motech, E-TON, Gintech, Sun Microsystems, Mosel Vitelic Inc., Sun Well Solar, Uniteck, Green Energy Technology, Solartech Energy Corp. and Neo Solar Power all adopt Turnkey Solution of Centrotherm. In 2010, Taiwanese manufacturers have expanded their production, and most of them have adopted the equipment of Centrotherm, pushing Centrotherm to the second place in the world.

GT Solar is a giant of CVD reactor and polycrystalline silicon ingot furnace in the world, and its CVD reactors and silicon ingot furnaces are widely used in the field of polycrystalline silicon which locates at the upstream of photovoltaic industry. In the field of polycrystalline silicon, manufacturers are competing with each other in capacity. GT Solar has made considerable achievements, but in the field of ingot furnaces, Chinese manufacturers have made great efforts to catch up, grabbing some market shares of GT Solar.

Roth & Rau AG a giant of PECVD engaged in CdTe thin film solar cell devices. Although First Solar is almost the only CdTe thin film solar cell company, it has continuously expanded production capacity, which has stabilized the revenue of Roth &

Rau AG.

MEYER BURGER is a large Swiss wafer cutting company renowned for diamond cutting technology. In January 2010, the company merged with its Swiss rival 3S Industries to further enhance its strength and scale, which allows it to gain more revenue in 2010.

Gebr Schmid is a leading manufacturer of PCB equipment. Based on years of experience in the field of PCB equipment, it has large shares in PV etching equipment market. Meanwhile, the company works closely with ABB to offer complete industrial robot equipment.

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