

# 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.

## Contents

### **1. PROFILE OF SOLAR (PV) CELL**

- 1.1 History
- 1.2 Principle of Power Generation
- 1.3 Classification
- 1.4 Process
- 1.5 Industry Chain

### **2. INDUSTRY CHAIN OF SOLAR CELL**

- 2.1 Status Quo of Market
- 2.2 Worldwide Industry Policies
  - 2.2.1 Germany
  - 2.2.2 USA
  - 2.2.3 Britain
  - 2.2.4 Japan
  - 2.2.5 Spain
  - 2.2.6 India
  - 2.2.7 China
  - 2.2.8 Other Countries
- 2.3 Global Solar Cell Industry
  - 2.3.1 China
  - 2.3.2 Germany
- 2.4 Upstream of Industry Chain - Polysilicon
- 2.5 Polysilicon Supply and Demand
- 2.6 Thin Film Solar Cell
  - 2.6.1 CdTe Thin Film Cell
- 2.7 Concentrated Photovoltaics (CPV)
  - 2.7.1 Introduction
  - 2.7.2 Status Quo
  - 2.7.3 Trough Solar Power Generation
  - 2.7.4 Parabolic CPV
  - 2.7.5 Tower CPV
- 2.8 Dye Sensitized Solar Cell

### **3. SOLAR CELL DEVICE INDUSTRY**

- 3.1 Market Scale
- 3.2 Polysilicon Solar Cell Device
- 3.3 Amorphous Silicon Thin-Film Solar Power Production Equipment
  - 3.3.1 Single-chamber & Multi-wafer
  - 3.3.2 Multi-chamber & Single-wafer
  - 3.3.3 Combination of Single-chamber and Multi-chamber
  - 3.3.4 Roll to Roll
- 3.4 Global Solar Cell Equipment Industry
- 3.5 German Solar Cell Equipment Manufacturers
- 3.6 China Solar Cell Equipment Industry
  - 3.6.1 Cleaning and Texturing Machines
  - 3.6.2 Diffusion Furnace
  - 3.6.3 Tubular PECVD
  - 3.6.4 Supplier of Whole Line

#### **4. SOLAR CELL (PV) EQUIPMENT MANUFACTURERS**

- 4.1 Oerlikon
- 4.2 Centrotherm Photovoltaics AG
- 4.3 ULVAC
- 4.4 GT Solar
- 4.5 Roth & Rau
- 4.6 MEYER BURGER
- 4.7 Manz Automation
- 4.8 Gebr Schmid
- 4.9 Applied Materials
- 4.10 CETC-48
- 4.11 VON ARDENNE
- 4.12 Shanghai Sunhisolar Co., Ltd
- 4.13 Jiangsu Huasheng Tianlong Photoelectric Co., Ltd
- 4.14 Beijing JYT Corporation
- 4.15 Beijing Sevenstar Electronics Co., Ltd.
- 4.16 NPC
- 4.17 Zhejiang Jinggong Science & Technology Co., Ltd

#### **APPENDIX: LIST OF GLOBAL SOLAR CELL EQUIPMENT MANUFACTURERS**

- 1. Complete Production Line
- 2. Cleaning Equipment

3. Diffusion Equipment
4. Etching Equipment
5. Laminating Equipment
6. Screen Printing
7. Tester & Sorter
8. Other Furnace Equipment
9. Other Equipment
10. Component Packaging Equipment

## Selected Charts

### SELECTED CHARTS

Technology Distribution of PV Cell Industry by Region, 2009  
Global Distribution of PV Cell by Technology, 2009-2014E  
PV Installed Capacity of Germany, 2010-2014E  
PV Installed Capacity of USA, 2010-2014E  
PV Installation of Britain, Apr-Jul 2010  
PV Installed Capacity of Britain, 2010-2014E  
PV Installed Capacity of Japan, 2000-2014E  
PV Installed Capacity of India, 2000-2014E  
PV Installed Capacity of China, 2000-2014E  
PV Installed Capacity of Spain, France, Belgium, Portugal and Greece, 2008-2014  
Capacity and Output of Crystal Silicon Cell in China, 2006-2011  
Chinese PV Power Plant Planning  
Operation Models of PV Power Plants in China  
Accumulative Installed Capacity of German Solar Cell, 2000-2008  
Output of German Solar Cell, 2000-2010  
Polysilicon Refining Process  
Spot Price of Polysilicon, Jan 2009 -Aug 2010  
Global Market Demand for Solar Cell Equipment, 2003-2014  
Output Value of PV Equipment Industry, 2008-2013E  
Production Flow of Polysilicon Solar Cell  
Production Flow of Amorphous Silicon Solar Thin Film Cell  
Output Value of Global Solar Cell Equipment by Technology, 2008  
Output Value of Global Solar Cell Equipment by Region, 2010  
Organizational Structure of OERLIKON  
Revenue and EBIT Rate of Oerlikon, 2004-2010  
Revenue of Oerlikon by Division, 2007-H1 2010  
Technology Roadmap of Oerlikon  
Organizational Structure of Centrotherm Photovoltaics AG  
Revenue and EBIT of Centrotherm Photovoltaics, 2005-2010  
Revenue of Centrotherm Photovoltaics by Region, 2006-H1 2010  
Revenue of Centrotherm Photovoltaics by Business, 2006-H1 2010  
Revenue of Centrotherm Photovoltaics by Product, 2008-H1 2010  
Order Book of Centrotherm Photovoltaics, June, 2009-June 2010  
Revenue of Centrotherm Photovoltaics by Business, Q3 2009  
Revenue of Centrotherm Photovoltaics by Region, H1 2010

Revenue of Centrotherm Photovoltaics by Business, H1 2010  
Shipment of Centrotherm Photovoltaics by Product, 2008 vs. Q1-Q3, 2009  
Financial Data of Centrotherm Photovoltaics by Division, H1 2010  
Expenditure of Centrotherm Photovoltaics by Proportion, H1 2010  
Revenue and Operating Margin of ULVAC, FY2004-FY2010E  
Global Presence of ULVAC  
Revenue of ULVAC by Region, FY2002-FY2010  
Quarterly Order Value of ULVAC by Division, FY2010  
Quarterly Revenue of ULVAC by Division, FY2010  
Orders of ULVAC by Division, FY2000-FY2011  
Revenue of ULVAC by Division, FY2000-FY2011  
Revenue of ULVAC by Division, FY2011E  
Orders of ULVAC by Division, FY2011E  
Research Expenditure of ULVAC, FY2000-FY2011  
ULVAC Revenue from Flat-panel Display and Solar Equipment, FY2005-FY2010 vs. FY2014  
Revenue of ULVAC by Region, FY2005-FY2009  
Revenue of GT SOLAR by Business, FY2009-FY2010  
Revenue and Gross Margin of GT Solar, FY2006-FY2010  
Expenditure Distribution of GT Solar, FY2009-FY2010  
Recent Orders of GT Solar  
Revenue of GT Solar by Region, FY2007-FY2010  
Main Customers of GT Solar  
Revenue and EBIT of Roth & Rau AG, 2004-2010E  
EBIT of Roth & Rau, Q3 2009  
Revenue of Roth & Rau by Product, H1 2010  
Revenue of Roth & Rau by Region, H1 2010  
Order Intake of Roth & Rau by Product, H1 2010  
Order Intake of Roth & Rau by Region, H1 2010  
Order Backlog of Roth & Rau, H1 2010  
Organizational Structure of MEYER BURGER  
Revenue and Gross Profit of MEYER BURGER, 2006-2010E  
Revenue of MEYER BURGER by Region, H1 2010  
Revenue and Pre-tax Profit of Manz Automation, 2005-2010  
Revenue of Manz Automation by Region and by Business, 2009  
Order Backlog and Revenue by Business of Manz Automation, End of June 2010  
Revenue and Gross Margin of Applied Materials, FY2004-FY2009  
Sales Revenue of Applied Materials by Division, FY2006-FY2009  
New Orders of Applied Materials by Region, Q2-Q3 FY2010



Revenue of Applied Materials by Region, Q2-Q3 FY2010  
Revenue and Orders of Applied Materials by Division, Q3 FY2010  
Order Backlog of Applied Materials by Division, Q3FY2010  
Operation of New Energy Division of Applied Materials, Q3 FY2010  
Order Value of Applied Materials by Division, FY2006-Jan-Sep FY2010  
Revenue of Applied Materials by Division, FY2006-Jan-Sep FY2010  
Revenue and Gross Margin of Tianlong Photoelectric, 2006-2012  
Organizational Structure of JYT Corporation  
Revenue and Operating Margin of NPC, FY2006-FY2010  
Accumulative Installed Capacity of Major PV Markets, 2001-2009  
Newly-added Installed Capacity of Major PV Markets, 2002-2009  
Global Newly-added PV Installation Demand Distribution by Region, 2000-2014E  
Distribution of Newly-added PV Installation Demand in Europe by Region, 2000-2014E  
Rank of 34 Solar (Photovoltaic) Cell Manufacturers Worldwide by Revenue and Output, 2009-H1 2010  
Gross Profit Margin of Major Photovoltaic Manufacturers Worldwide, H1 2010  
Net Profit of Major Photovoltaic Manufacturers Worldwide, H1 2010  
Capacity and Output of Major Crystal Silicon Cell Manufacturers in China, 2008-2010  
Equipment Source & Capacity of Thin Film Solar Cell Manufacturers in China  
Output Value of German Solar Cell Enterprises, 2004-2009  
Capacity and Output of Leading Polysilicon Manufacturers in the World, 2010-2013E  
Supply and Demand of Polysilicon, 2008-2011E  
Power Generation Cost of CdTe Cell, 2008-2011E  
Core Components of Trough Power Generation Technology  
Major Trough Solar Power Generation Projects in the World  
Major Parabolic Solar Power Generation Projects in the World  
Development Goals for Cost and Performance of Parabolic Solar Power Generation  
Major Tower Solar Power Generation Projects in the World  
Rank of Global PV Equipment Manufacturers by Revenue, 2008-2010  
Revenue of Main Silicon Solar Cell Equipment Manufacturers in China, Jan.-Jun. 2010  
Rank of PV Equipment Manufacturers in China by Revenue, 2009  
Orders, Revenue and EBIT of Oerlink's PV Division, 2007-H1 2010  
Major Customers of Oerlinkon, 2009  
Assets and Net Asset Value of Centrotherm Photovoltaics, 2005-2008  
Employees and Residual Order Value of Centrotherm Photovoltaics, 2005-2009  
Client Structure of GT Solar, FY2007-FY2010  
Financial Data of Manz, 2005-2009

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