

Next-Generation High Efficiency Crystalline Si Solar Cell Technology and Market Forecast (2008~2015)

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Abstracts

The PV market had grown explosively with the annual growth rate of more than 75% since 2006 to 2010, propelled by subsidy packages of each government, letting the entire world realize the growth potential of the renewable energy industry. However, the rapid growth of the PV market in a short period time produced a side effect - a sharp increase in financial burden of each government due to the subsidies. Accordingly, as countries in and around Europe, the major PV markets, began to push policies concentrated on the rooftop with swinging cuts to subsidies, the PV industry is undergoing a change - a significant increase in demand for the high efficiency solar cells that allows small area for higher output at low cost.

The most typical examples of the high efficiency c-Si solar cell are IBC (Interdigitated Back Contact) of Sunpower and HIT(Hetero-junction with Intrinsic Thin-film) of Sanyo. Efficiency of these products is 3~4% higher than that of typical c-Si solar cells, but the prices are more than 40% higher. Thus it is not easy for those products to come into wide use, considering the on-going race for low-cost implementation in the PV market. Using this market situation as a stepping stone to strengthen the identity of 'China Brand' and increase their market share, Chinese companies are devoting their all strength to commercialization of low and middle priced high-efficiency Si solar cells such as Selective Emitter, MWT(Metallization Wrap-through), Bifacial before and after 2011.

In the high-efficiency Si solar cell market alone, IBC of Sunpower and HIT of Sanyo have accounted for market share of more than 80% until 2010. However, Chinese companies are recently entering the high efficiency solar cell market, as global equipment and material companies including Centrotherm, Roth&Rou, Schmid, Manz, and Innovalight provide solutions for manufacturing low cost high efficiency selective

emitter solar cells at low investment costs. For example, Suntech and Yingli have already established their production lines for high efficiency solar cells of 500MW and 600MW respectively. Companies such as JA Solar, Canadian Solar, China Sunergy, and Trina are planning to construct production lines of hundreds of MW by the end of 2011. With the market entry of Chinese companies into the low and middle priced high-efficiency solar cell market, it is expected that the market share of the existing expensive products, IBC and HIT will decrease in the market share to less than 20% and low and middle priced high efficiency solar cells will accounting for more than 80% in 2015.

Considering the increase in demand for the high-efficiency solar cell and the efforts of Chinese companies to build up large-scale production facilities, the high-efficiency c-Si solar cell market is expected to grow rapidly with the annual growth rate of more than 70% by 2015; especially, the high-efficiency Si solar cell will grow rapidly, increasing its occupancy in the entire c-Si solar cell market from 5.1% in 2010 to 37.3% in 2015.

Likewise, the high-efficiency c-Si solar cell is the biggest issue in the current PV market. In this situation, Solar&Energy has issued a report on the 'Next-generation High-efficiency Si Solar cell Technology and Market Forecast (2008~2015)' which covers each technology for high efficiency and mass-production of the high-efficiency c-Si solar cell in detail as well as market forecast and analysis.

This report is intended to examine

Key technology for high efficiency c-Si solar cell

Development trend of each high-efficiency Si solar cell technology (BCSC/ LFC/ HIT/ Back Contact/ Passivated Emitter/ Selective Emitter/ Bifacial/ Quantum Dot)

Trend of technology development and commercialization for high efficiency solar cell; 25 research institutes and 23 companies

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