Recent Development of Thin Film Si Solar Cell Technologies for Commercialization

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ABSTRACT

Recently the thin film Si solar cell technology has been drawn high attention on its low cost production capability based on the well improved LCD technologies. Since the material cost has been increased due to Si feedstock shortage with the steeply increased demands for the bulk Si solar cell, therefore material cost reduction is one of the key issues. The thin film Si solar cell technologies could resolve this issue via their unique advantages of reduced Si consumption, high conversion efficiency over 12 %, and installation flexibility using a flexible substrate with its light weight. On the other side, their performances need to be improved to ensure long term reliability and to meet the minimum qualification criteria. Lately, many major thin film Si solar cell providers announced their improved efficiency of tandem cells, releasing plans to the market, and the increasing capacity for Si thin film based solar cell extended to tens of mega watts. For commercial success in the major solar cell market such as roof top solar cell and ground mounted solar cell for power generation, the key breakthrough technologies like the high deposition rate of nano-crystalline Si thin film should be developed

In this presentation, the potential of the thin film Si solar cell technologies will be analyzed comparing with the bulk Si solar cell. The recent development of the thin film Si solar cell technology and the issues requiring technological breakthrough will be explained. The brief introduction on the solar cell R&D activities in the LG Electronics will be given.