

Pressure Sensitive Tape Materials and Technologies Utilized by the Solar Module Manufacturers-Where are the Opportunities Today?

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Renewable energies such as Photovoltaics (PV) do not produce green house gases, specifically carbon dioxide, and thus are known to have a positive effect on the climatic balance. Photovoltaics are simply semi-conductive devices which will produce electricity when exposed to light. In fact, the word “photovoltaic” means electricity from light.

The manufacturing of solar cells and photovoltaic grids has expanded dramatically in recent years. Photovoltaic production has been nearly doubling every two years – increasing by 30-45% each year since 2002 – making it one of the fastest-growing energy technologies. A slowdown from the year-over-year growth between 2009 and 2010 was experienced in 2011, driven by the reduction of FIT (Feed-in Tariffs) as well as additional incentive policies. This was offset, however, by the collapsing module pricing, leading to the strong 4th quarter growth in module sales within countries like USA, Belgium, UK, Germany and others. An overall 18-20% Y/Y European growth was recognized.

With the overcapacity of module manufacturing came the 40-50% reduction in module selling price. Supply based pricing was not nearly reduced to these levels, which led to massive margin reductions, consolidations and even attrition of several of the module manufacturers. With the abrupt reduction in the solar module pricing came a faster-than-expected drive toward grid parity. The reductions in FIT subsidies, along with subsidy increases within non-European areas, opens a very dynamic and global arena for photovoltaics. An overview of the trends as well as short-term expectations will also be reviewed.

Market information will be provided which depicts the trends occurring within the various technologies and geographical regions. Discussion and information will be provided comparing the technologies, as well as going into more depth as to the performance requirements, applications and voids within the material offerings for solar. Special emphasis will be placed on adhesives and sealing technologies, both within and external to the PSA space.

The demand in the USA is rapidly expanding due to falling system prices, stimulus funding and regulatory incentives. USA is poised for excellent growth as a primary global demand center. Information will be provided defining the drivers for the present and future growth; *i.e.*, both domestically and internationally, as well as the forecasts as to future expectations.

In order to support this outstanding growth, unique and various material sciences will continue to be needed. This provides outstanding opportunities for the pressure sensitive tape manufacturers, converters, distributors and adhesive suppliers. Busbars, C2S tapes, edgetape, foamtapes, holding tapes, mounting tapes, protective sheets, identification labels, semi-conductive materials as well as many other products and technologies will be covered, along with a variety of module technologies. Thin film (Cadmium Telluride-CdTe; Amorphous Silicon-a-Si; Copper Indium Gallium (Di) Selenide-CIGS), Crystalline Silicon (c-Si), Organic Photovoltaic (OPV), Dye Technology, Concentrated Photovoltaic (CPV) and Concentrated Solar Thermal (CST) define today's major offerings for the photovoltaic and indirect solar thermal technologies. A high level overview of these systems as well as some of the recent advances and future growth forecasts has also been presented.

Future trends and expectations are discussed, both along the lines of market growth as well as material science changes and advances. From voids in the marketplace, to alternatives to the present day mainstays of module material components, a review of these unique and different development opportunities are addressed.

Finally; we will be coalescing the market, technology, and trend information to allow for a clearer picture of the opportunities and potential directions available to the adhesive and converter supply base. 2011 was a very dynamic and challenging year, however, the PV market is certain to continue to be an outstanding target for the material suppliers.