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Solar Breakthrough to Steal Market Share

Lux Research Report Finds That Thin-Film (Amorphous Silicon, Cadmium Telluride, and CIGS) to Rake in $19.7 Billion Combined in 2012, Accounting for 28% of the Solar Market

New York, NY – July 1, 2008 – After years of heady growth in the PV market led largely by crystalline silicon, thin-film technology has reached a critical mass and is poised to start taking significant market share from incumbent technology. Thin-film silicon technologies from turn-key vendors will be ramping up in large scale during the second half of 2008, while cadmium telluride (CdTe) module producers such as First Solar – and new entrants Calyxo and Primestar – execute aggressive ramps. Meanwhile, copper indium gallium diselenide (CIGS) module manufacturers are reaching the cusp of technology viability, with tremendous disruptive potential. However, while the growth rate for thin-film technology will become more robust from the second half of 2008 forward, not every company will win. With over 100 companies developing inorganic thin-film solutions, most of them with unproven or undifferentiated technologies, clear winners and losers will rapidly emerge, according to a report from Lux Research entitled "Solar State of the Market Q1 2008: The End of the Beginning."

“CdTe module manufacturing costs are less than one third that of crystalline silicon, and the new amorphous silicon turn-key lines by Applied Materials and Oerlikon promise half the cost to start with further declines in the future,” says Lux Senior Analyst Michael LoCascio. “These technologies will be the first choice for the burgeoning utility sector, squeezing out incumbent technology.”

To bring clarity to the solar market, a six-person team at Lux Research studied five solar technologies in depth – 1) crystalline silicon photovoltaics (PV), which dominate the market today, 2) multi-junction PV, used in high-concentrating PV (HCPV) systems, 3) inorganic thin-film PV, 4) organic and Grätzel PV, and 5) solar thermal. The research team built a new forecast that independently models solar supply and demand through 2012 using a rigorous, scenario-driven methodology, across five technologies, three application segments, and 10 countries. For each technology, the team conducted detailed cost and performance analyses based on interviews with technical experts and reviews of patent and technical literature. From these forward-looking cost and performance projections, the Lux team was able to project the estimated demand and supply for each technology through 2012. The Lux Research report finds that:

- Inorganic thin-film PV technologies will mature over the next five years, as new producers follow in the footsteps of thin-film specialist and current market darling, First Solar. Inorganic thin-film PV will erode crystalline silicon PV’s current dominant market share, grabbing 28% of the solar market in 2012 with $19.7 billion in sales.

- High-concentrating PV systems – using high-efficiency but high-cost multi-junction PV cells – will disappoint through 2009, as system complexity, limited robustness in harsh deployment environments, and the need for great precision dashes the hopes of developers for a smooth, rapid ramp. While products will become mature enough for deployment thereafter, installations using multi-junction PV will reach just $1.23 billion in 2012.

- Solar thermal technologies (also known as concentrating solar power, or CSP), like those used at the 64 MW Nevada Solar One power plant that began operations last July, will begin to make an impact on the utility market for solar power. They will, however, face an uphill adoption battle because of limited power distribution infrastructure and the beginnings of regulatory aversion towards large-scale solar installations. By 2012, new annual solar thermal installations will reach 3.26 GW, accounting for $9.34 billion in revenue.

- Organic and Grätzel PV technologies, which promise much lower costs than any other approach – as well as the possibility of extremely flexible, and even wearable, solar cells – won't mature in the next five years. Beyond 2012, however, these technologies are likely to have a major impact, albeit in unexpected applications.

- By 2012, cost reductions will bring solar to peak power grid parity in some places – for instance, in countries with high insolation and growing low-cost domestic production, like India.

The Lux Research analysis found important implications for start-up companies with disruptive technologies targeting the solar industry. "As roughly 100 thin-film developers race to market over the next few years, we expect most of them to fall by the wayside as technology hurdles overcome them – which will especially be the case for novel CIGS producers," said Ted Sullivan, Senior Analyst at Lux Research. "The remaining thin-film developers with viable technology will be snapped up by incumbent players eager to insert themselves into the growing new segment – as CIGS developer, Global Solar, has been by Solon. Investors and market watchers should expect to see only one or two 'home-run' plays, similar to First Solar, coming out of the impending thin-film ramp."

The 137-page report, "Solar State of the Market Q1 2008: The End of the Beginning," includes solar market sizes and forecasts from 2000 to 2012, broken down by technology, applications, and country. It offers in-depth discussion of each of the five major solar technologies, providing breakdowns of the value chain for each technology, as well as benchmarks for technology variations, drivers and challenges, key companies, key events, key trends and developments, and technology outlook. The report also provides a detailed analysis of all VC, IPO, and M&A activity in solar since 1995, and takes a deeper look at the key issues of polysilicon supply, the maturation of inorganic thin-film PV, and government subsidies. The full report is available immediately to clients of Lux Research's Solar Intelligence service. For information on how to become a client, or how to obtain a copy of the report, contact John Schwartz at john.schwartz@luxresearchinc.com or (646) 649-9582.

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