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SUSTAINABLE ENERGY STUDY #21

New NanoMarkets Report Predicts Thin-Film Photovoltaics Market Could Reach \$7.2 Billion by 2015 - PV Could Eventually Account for as Much as 20 Percent of the U.S. Market's Energy Needs:

NanoMarkets, August 6, 2007

http://www.nanomarkets.net/news/pr_detail.cfm?PRID=215

The world thin-film photovoltaics (TFPV) market is forecast to reach \$7.2 billion by 2015, compared to just over \$1.0 billion today, according to a new report released by NanoMarkets LC, an industry analyst firm based here.

The market is being driven by the inherent advantages of TFPV including low cost, low weight, and the ability to manufacture on flexible substrates and embed solar power capabilities into walls, roofs and even windows. Unlike more conventional PV that uses crystalline silicon, TFPV also has the ability to operate under low light conditions. The report notes that to support the growing demand for TFPV, most manufacturers are ramping up production capacity and several - including First Solar, Fuji Electric, Nanosolar, Sanyo, Uni-Solar and G24i - are building plants with more than 100 MW in capacity.

Some of the findings of the report include:

Because worldwide energy prices are rising fast and PV prices are falling fast, PV will carve off a big slice of the energy market and could eventually account for as much as 20 percent of the U.S. market's energy needs. Because TFPV costs less than conventional PV, TFPV is most likely to take off first. Just a few years ago, TFPV was only five percent of the entire PV market, but it is expected to account for 35 percent of the photovoltaics market by 2015. PV also offers predictable pricing, something that fossil fuels cannot do.

Conventional PV is expensive to make. By contrast TFPV can be manufactured using simple printing or other R2R machines; the value of printed TFPV is expected to reach just over \$3.0 billion by 2015. Printing PV has the potential for lowering capital costs by as much as 75 percent, reducing waste and increasing throughput.

Since TFPV is much lighter than conventional PV and can be more easily applied to curved and non-planar surfaces, TFPV is easier to install on roofs and walls. Where a lot of panels need to be installed on a roof, using TF PV reduces the likelihood that the roof will have to be specially

reinforced. TFPV also enables windows that double as PV panels, making PV much more practical for buildings large and small.

PV based on organic materials offers hope for the future. Organic PV is more ecologically friendly than other PV approaches. Efficiencies of organic PV are improving rapidly and new cell architectures promise that the performance of organic PV devices could come close to or possibly even exceed those of their purely inorganic counterparts. By 2015 we expect shipments of organic PV to be around 500 MW.

About the report:

The new NanoMarkets report provides a complete analysis of the commercial opportunities for amorphous silicon, CIS/CIGS, CdTe and organic/hybrid TFPV markets. It also examines the role that new encapsulation materials and transparent conductors and silicon inks will have on this market. Applications for TF PV covered include large projects and utilities, commercial and industrial buildings, consumer electronics and military and emergency services. The report also includes detailed eight-year forecasts (in dollar and peak MW terms) of these markets as well as profiles of all the leading firms developing and marketing this emerging technology and an assessment of the impact of government funding and subsidies in the U.S. Europe and Japan on TFPV on.

Among the firms discussed in the report are Antec Solar, AVA Tech, BASF, Bosch, CDT, DayStar, Dow Corning, EPV, FEE, First Solar, Fuji Electric, Flexcell, G24i, Global Photonic Energy, Global Solar, Heliatek, HelioVolt, Honda, Innovalight, International Solar Electric Technologies, JNSOLAR, Kaneka, Konarka, Matsushita, Miasolñ, Mitsubishi, Mitsui, Nanosolar, PowerFilm, Sanyo, Schott Solar, Sharp, Shell Solar, Showa Shell, Seiko Epsom, Sinonar, Solar Cells, Sulfurcell, Sumitomo, Sunset Energietechnik, Symmorphix, Terra Solar, Uni-Solar and Würtz Solar.

Additional details are available on the firm's website at <http://www.nanomarkets.net> as well as at http://www.nanomarkets.net/products/prod_detail.cfm?prod=6&id=241.

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Thin-Film PV Market Could Top \$7 Billion by 2015:

GreenerBuildings.com, August 9, 2007

http://www.greenbiz.com/news/news_third.cfm?NewsID=35710

The global thin-film photovoltaic (TFPV) market is poised for explosive growth during the next 10 years, an industry analyst firm predicts.

Low cost, low weight, ease of manufacturing and success in roof, wall and window applications is driving an industry that is forecast to reach \$7.2 billion by 2015, compared to slightly more than \$1 billion now, according to a new report from NanoMarkets LC.

Already, manufacturers such as Sanyo and Fuji Electric are ramping up production and building more plants with more than 100-megawatt capacities, the report said.

The prediction comes at a time when conventional PV is gaining traction in more mainstream applications.

"With the worldwide rise in energy prices, PV prices are now closer to general energy prices than ever before," the report said. "Once they reach a point that is close to parity, PV is well set to break out of its niche application status and become a major force to be reckoned with, not just a few percentage points of worldwide energy consumption."

In the past, a shortage of the silicon used to make traditional PV drove up prices and hampered its widespread use. Although now more abundant, crystalline silicon is still expensive because of the limited supply and numerous processing steps needed for its manufacture.

"Because TFPV costs less than conventional PV, it is TFPV that is most likely to reach "take off" prices first, all the more so, because at least some TFPV materials have more potential than crystalline silicon for cost reductions," the report said.

TFPV can be manufactured using printing machines. Printing PV could potentially lower capital costs by 75 percent, the report found, with reduced waste and increased output.

The value of the printed THPV market could top \$3 billion during the next 10 years. It accounted for only 5 percent of the overall PV market a few years ago but that figure is expected to grow to 35 percent by 2015.

The report predicted that TFPV won't be impacted even if silicon should flood the market because of its low cost and lightweight nature, which allows it to be applied easily to curved and non-planar surfaces. Its weight also makes its rooftop application much easier than heavier conventional panels.

The report shows declining rates of market growth during the end of the forecast period. The report acknowledges that PV, along with the overall clean tech industry, has taken on a type of "fad" quality in light of the current clean tech boom spurred by environmental concerns and the high cost of fossil fuels, which sparked similar interest during the oil crisis of the 1970s.

"Given the current fervor with which firms and investors are pursuing high-tech opportunities, the boom seems just too hot not to cool down," the report said.