



Highlights from FlexTech’s Quarterly Workshop on Flexible, Printed Electronics Konarka, New Bedford New Bedford, Massachusetts September 15 – 16, 2010

More than most disruptive technologies, Thin Film PV (TFPV) manufacturing requires close cooperation among industry, academia, and government in order to meet the aggressive goals of the U.S. Department of Energy to advance energy independence. The emerging field of thin film organic photovoltaics, in particular, cannot easily adapt old designs of legacy production tools. The transition from proof-of-concept demonstration, to prototype, to manufacturing pilot, to full-scale manufacturing is not trivial.

With these challenges in mind, FlexTech Alliance recently held its fall quarterly workshop - **“Advanced Materials and Processes Enabling Thin Film PV R2R Manufacturing”**. This workshop focused on technology transfer and scale-up of organic and inorganic materials and their processes from the lab to a manufacturing fabrication line. A wide range of manufacturing issues were discussed – process development, control, modeling, scale-up, metrology and defectivity, tooling and supply chain synergy.

The workshop was well attended with more than 65 people present, from local printing and PV industries and from as far away as Japan. Academia was well represented with participants from Massachusetts Institute of Technology (MIT), University of Massachusetts (UMass.), and Western Michigan University (WMU).

As a precursor to the workshop, attendees were able to experience, first hand, the world’s largest roll-to-roll flexible thin film solar manufacturing facility during the tour of Konarka, New Bedford. This plant is a re-engineered, former Polaroid plant - now capable of producing in excess of 10 million square meters of PV material per year. The tour provided an understanding of the size, scope, and complexity involved in the integration of several PV manufacturing steps.

During the morning session of the workshop, presentation topics covered market opportunities, energy strategies, and manufacturing challenges.



Larry Weldon, Vice President, Manufacturing, Konarka

Panel Discussion: “How do we facilitate the development of a strong PV manufacturing industry and supply chain in the U.S.?”

The afternoon session involved an interactive exchange between attendees and a panel of six experts consisting of Larry Weldon and Eitan Zeira of Konarka, Jim Watkins from U.Mass., Bindu Nair of the Natick Soldier Research Development and Engineering Center, Brian Anthony from MIT, and Bob Reuss, former DARPA program manager.

The discussion began with questions about how to best retool from a traditional printing facility to printing flexible electronics. The conversation then focused on developing metrology and defectivity tools that can enable in-line and real time functional testing of thin film photovoltaics.

Presentation topics

<p><i>Solar State of the Market: Current Opportunities and Challenges</i> A look at the key challenges across the value chain that today's thin film developers must overcome, as well as new opportunities they can serve moving forward.</p>	<p>Johanna Schmidtke, Sr. Analyst, LUX Research</p>
<p><i>Developing a Power and Energy Strategy For the Soldier and Small Combat Unit</i> An examination of methods to provide improved alternative power generating capability using flexible photovoltaics (PV) for forward operating bases, off-grid training sites, individual soldier items, and Special Operation Forces applications.</p>	<p>Bindu R. Nair, Technical Assistant to the Director, Natick Soldier Research Development and Engineering Center</p>
<p><i>Manufacturable Approaches to Self Assembled Energy Generation and Storage Devices</i> An in-depth analysis of the self assembly of block co-polymers (and hybrid materials) and why these structures are of interest for roll-to-roll assembly of devices for PV and energy.</p>	<p>Dr. James Watkins, Director NSF Center for Hierarchical Manufacturing, University of Massachusetts</p>
<p><i>Future Challenges for the Industry of Organic Photovoltaics</i> An evaluation of printing challenges for different processes, substrates and inks, plus a review of common printing defects – their cause, effect and prevention.</p>	<p>Eitan Zeira, VP Printed Organic Photovoltaics, Konarka</p>



Johanna Schmidtke, Sr. Analyst, LUX Research presents
“Solar State of the Market: Current Opportunities and Challenges”.