Date: **September 16, 2010**

Subject: **US DOE Photovoltaic (PV) Manufacturing Initiative**
Funding Opportunity: DE-FOA-0000237 (0000259)

Title: **Great Lakes - University Photovoltaic Manufacturing Initiative**

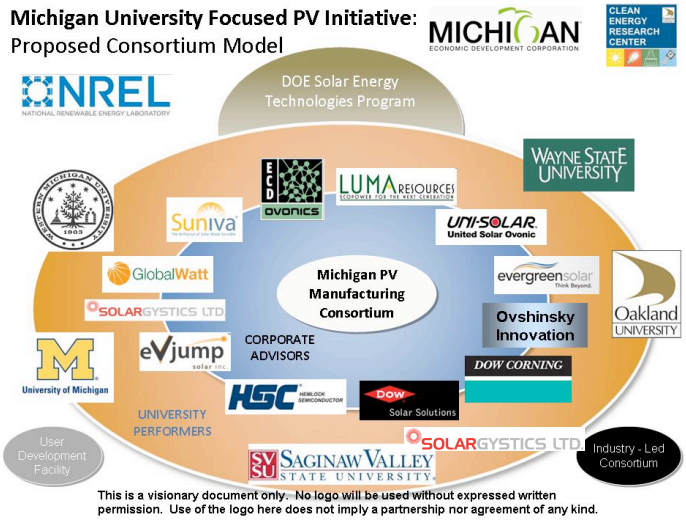
Funding: **US DOE $2.5M per year for five years**

The Oakland University (OU) School of Engineering is assembling a collaboration with the University of Michigan (UM), Fraunhofer USA, Wayne State, and other universities, as well as for-profit companies engaged in the manufacture of PV materials/cells/panels, or in the process of developing, demonstrating, and commercializing innovative PV manufacturing technologies. A concept paper was submitted to the DOE preliminary solicitation for a "PV Manufacturing Initiative" (PVMI) and received a favorable response; a grant proposal will be written by an OU/UM/Fraunhofer team for submission by October 5th.

The OU Clean Energy Research Center (CERC) proposes the following collaborative effort to support and enhance the significant amount of PV manufacturing and innovation already underway in the State of Michigan. The basic concept is to create a structure wherein industry-expressed needs for solutions in the PV manufacturing sector will be funded as University R&D sub-awards under a five to ten year plan. This proposal will apply for a $2.5M / year grant from the Department of Energy for five years.

At its core, the PVMI collaboration will consist of a panel of industry and academic experts in the PV field. This panel will: 1) review R&D needs identified by industry partners, 2) select those of highest technical merit and industry-wide impact, 3) pair high-merit projects with qualified researchers and labs, and 4) fund university projects aimed at addressing these R&D needs. Basic research will not be funded. Only R&D projects which directly support new manufacturing ventures, increased production capacity, or the resolution of technical challenges in existing PV manufacturing processes will be supported.

The concept paper included a 10 year business model to fund multiple R&D projects of a diverse technical nature. Overhead of approximately 15% will be used to create and administer the collaboration staff, facility space, and for operational expenses. The remaining 85% will fund R&D projects under partnering agreements or sub-awards to competitively selected universities. Successful projects that result in profitable PV ventures will repay a portion of their R&D grant support over a multi-year period. Additional State of Michigan tax credits and grants will be pursued to supplement the initial DOE funds in order to make this program self-sustaining. A 20% cost share is required by the DOE soliciation, therefore industry and university partners will be asked to limit overhead and/or offer some funding of "in-kind services" or other soft costs to provide this DOE cost share. A tiered cost share system will be implemented for universities, innovative startups, small companies, and large companies.



Core Objectives

1) Commercialization of new manufacturing techniques, 2) Solving technical challenges of existing manufacturers to increase output or lower costs, 3) Increase United States Market share of worldwide PV cell and module production, 4) Increase gross MW output of US PV cell and module production,
5) Address multiple technologies and manufacturing challenges, 6) Will not focus all resources on one technical option, but on many, and 7) Commercialization of new and cutting edge technologies.

Proposed Collaboration Structure
The PVMI collaboration will consist of Michigan universities and industry partners as shown in the preceding figure. Most of the parties in the figure have expressed strong interest or committed to joining the collaboration. The industry group consists of a number of market leaders in silicon production, thin film PV manufacturing, building integrated PV modules, and multiple technology innovators working on the next generation of lower cost, high reliability PV.

Strategic Technical Objectives
At this early stage, this collaboration will specifically refrain from committing to any one particular PV technology. This collaboration will focus on the needs of the rapidly growing Michigan PV manufacturing industry, deficiencies in the module and sub-module manufacturing processes, challenges in the supply chain, and support for emerging technologies. One of the first steps of the collaboration will be to create a Michigan PV Manufacturing Roadmap.

At a minimum the roadmap will: 1) Assess the current PV market and state of manufacturing capabilities, 2) Assess roadblocks and technical challenges, both industry wide and technology specific, 3) Identify tasks to provide incremental, evolutionary change based on proven, existing technologies and companies, 4) Identify potential investments in higher risk R&D to support innovation, 5) Determine common goals and a "destination", even if this is a mutually agreed upon "moving target", and 6) Provide a shared vision of how to get "there."

Business Model
A five year grant from the DOE at $2.5M per year will create the PVMI collaboration and fund the start of the program. Oakland University's Clean Energy Research Center will administer the program for an estimated cost of approximately 15% annually, with the remaining funds being distributed as cost share sub-awards to partner universities. In order to create a successful funding model to maximize the delivered R&D projects as well as continue the program for a full ten program, several other funding sources will be pursued.

Key players on the "PVMI core team" (as of 16Sep2010)

1. Jim Leidel, Oakland University, Energy Manager - Initiated pre-proposal; leidel@oakland.edu
2. Nicholas Cucinelli, UM Tech Transfer, Business Formation Specialist and PV entrepreneur - Initiated pre-proposal; ncucinel@umich.edu
3. Dr. Bruno Vanzieleghem, UM Michigan Memorial Phoenix Energy Institute (MMPEI), Assistant Director of Operations; brunov@umich.edu
4. JP LaForest, UM Business Engagement Center, Director; jplafor@umich.edu
5. Dr. Stefan Heineman, Fraunhofer USA Center for Laser Technology, Director - Fraunhofer USA is a applied R&D non-profit which works with industry and academia to prototype, test/validate, and incubate new technologies; sheinemann@clt.fraunhofer.com
6. Rachel Kuntzsch, KBS Inc., President and former business development for MEDC and NextEnergy - KBS is a successful Michigan-based grantwriting and business development firm. The KBS team has agreed to serve in a consulting capacity to coordinate writing and final submission of the proposal; rachel@kbsincorporated.com
7. Dr. Pravansu Mohanty, UM-Dearborn faculty member - Dr. Mohanty is a PV and advanced materials manufacturing expert who is serving as a faculty advisor to the core team; pmohanty@umich.edu