

APPLIED VENTURES

UPDATE

GROWING VENTURES

In this edition, we look at how Applied Ventures and its portfolio companies have grown in 2011; highlighting new additions, expansions, and the successful exit of our investment in Grandis, Inc.

New Team Member

Joseph Jeong, who joined Applied Ventures in August, is the newest addition to our team. Joseph's current focus is on energy storage and lighting. He is currently working with our portfolio company Tera-Barrier Films Pte. Ltd. and is also assisting with deals in China and Korea.

Prior to Applied Ventures, Joseph completed his MBA at Chicago Booth while interning with ARCH Venture Partners, a VC firm focused on life and physical sciences. Prior to business school, Joseph was a cleantech engineer at Samsung SDI working on the development of automotive lithium-ion batteries and fuel cell systems.

In addition to his MBA from Chicago Booth, Joseph also holds B.S., M.S. and Ph.D. degrees from the Georgia Institute of Technology, majoring in Aerospace engineering with a research focus on structural dynamics and acoustics.

Portfolio Company Exits

We are pleased to announce the successful exit of our portfolio company Grandis, Inc. in August. Grandis, based in Silicon Valley and a leader in spin transfer torque random access memory (STT-RAM), was acquired by Samsung Electronics Co., Ltd., making it the second Applied Ventures portfolio company to be acquired by Samsung this year, after Liquavista B.V.

Portfolio Company Developments

Applied Ventures has had an exciting year so far, adding two new companies to our portfolio. In April, we completed an investment in Inpria Corporation, a startup that is developing next-generation, high-performance materials for semiconductor processing. In August, Applied Ventures funded MTPV, LLC, a clean energy semiconductor chip company that has developed breakthrough technology for converting waste heat into electricity.

Our existing portfolio companies have also been active this

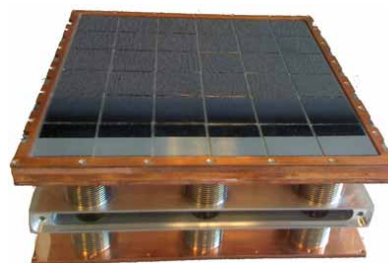
year. Enphase Energy, Inc., which makes microinverters for the solar industry, filed a registration statement with the Securities and Exchange Commission for a proposed initial public offering of its common stock. Applied Ventures was one of the earliest venture capital investors in the company.

ClearEdge Power, Inc., maker of fuel cell systems, installed four of its ClearEdge5 systems at Universal Studios Hollywood, which will enable the theme park to cut its carbon emissions from food operations by 40%. In August, ClearEdge raised \$73.5M in its Series E financing, which was one of the largest cleantech financings in the third quarter of the year.

Illumitex, Inc. announced that it had raised \$13.5M in financing in June. In the same month, Semprius Inc. announced that Siemens Energy Sector joined as a strategic investor, acquiring a ~16% stake in the company. Applied Ventures invested in an expansion of Kotak Urja Private Limited's Preference Share financing, to enable Kotak's expansion in the solar downstream market.

In June, Adesto Technologies Corporation announced that it would be shipping its CBRAM-based devices this year, with the help of its foundry partner Altis Semiconductor SA. To assist with the production ramp, Adesto announced two new appointments to its management team - Michael Van Buskirk as CTO and Ravi Sunkavalli as VP of Product Development. Michael was formerly the CTO of Spansion, a NOR flash memory manufacturer, and Ravi was formerly the VP of Hardware Engineering at Achronix, an FPGA startup.

Portfolio Spotlight - MTPV



A single 6" x 6" MTPV panel will generate between 250 and 500 watts.

A single 6" x 6" MTPV panel will generate between 250 and 500 watts. World-wide energy consumption is expected to increase by 40% over the next 20 years, but it is not clear how all this additional energy will be generated. Surprisingly, most of the energy we currently produce is actually lost to

the atmosphere as waste heat. So far there have been very few compelling solutions for capturing this waste heat and turning it back into useable energy.

Commercially-available energy harvesting solutions, such as organic rankine cycle (ORC) systems and microturbines, have relied on pumps, valves, fans and all manner of componentry. These mechanical approaches are generally limited to operating at relatively low temperatures (about the temperature of a simple kitchen oven), where there is a disappointingly low density of energy available to harvest. These approaches also have all the disadvantages associated with high maintenance costs, bulky size (some as large as tractor trailers), and a long time for return on investment.

Scientists and entrepreneurs have dreamt of the day when solid-state semiconductor chips, being ultrathin with no moving parts, would be capable of harvesting waste heat at a scalability not possible with ORC systems or turbines. Unfortunately, thermoelectric chips, which are the energy harvesting devices that have been developed over the last several decades to fulfill this dream, have not provided the level of conversion efficiency (typically limited to a few percent) needed to be a cost-effective way to solve a worldwide energy crisis.

Startup company MTPV, LLC, based in Austin, Texas, has developed a completely non-thermoelectric approach to solid-state energy capture. MTPV's devices utilize previously unexploited principles of physics to convert heat to electricity with a theoretical maximum conversion efficiency that is 400% greater than the theoretical maximum for thermoelectric devices. In addition, MTPV's chips are uniquely optimized to withstand high temperature industrial environments (such as in chemical plants, oil/gas flares, metal smelters, and glass foundries) that would render other energy harvesting systems useless. It is expected that MTPV's products could ultimately produce 10 kilowatts to 100 kilowatts per square meter. To put this into perspective, this would be 50 to 500 times the energy capture density of conventional solar modules at high noon at the equator. The key to MTPV's remarkable device performance is rooted in the precise control of thin film materials which are grown, deposited, and etched away by semiconductor processing equipment to create its vital microstructures.

We find the MTPV story to be extremely compelling. MTPV represents an intersection between the semiconductor and energy sectors — two of the largest global markets — and utilizes some of the most advanced semiconductor equipment technology to create its ground-breaking products. With our recent investment in MTPV, we are pleased to have the opportunity to help accelerate the development of a potentially important solution for our ever-expanding, energy-conscious world.

Events

Applied Ventures has been contributing to the venture community by being actively involved in industry events.

Our Investment Director, Eileen Tanghal spoke at the Organic and Large area and Printed Electronics conference (Hamburg, Germany) in June, and was the keynote speaker for the DisplaySearch Emerging Conference (San Jose, CA) in August. She will also be speaking at the Grow-California Cleantech Innovation Conference (Oakland, CA), and Printed Electronics Conference (Santa Clara, CA) in November.

Anand Kamannavar (Associate Investment Manager) spoke at the MRS Technology Innovation Forum (San Francisco, CA) in April, at the TechConnect Conference (Boston, MA) in June, and at the SVASE-GABA Leveraging Corporate Partners & Investors event (Palo Alto, CA) in August. He was a panelist at the AlwaysOn Going Green Conference (San Francisco, CA) on VC Funding Outlook for Global Greentech in September. He will also be judging at the 24th NREL Growth Forum (Denver, CO).

Brian Hubert (Associate Investment Manager) presented at the NVCA Annual Meeting (Boston, MA) in April, spoke at the CleanTech East Coast Academy Conference (Boston, MA) in June, and was a judge and panelist in the CleanTech VC Pitch (Palo Alto, CA) in August.

Tony Chao (Associate Investment Manager, China) has been increasing the firm's profile in China. He was a panelist at the Cleantech Investor Forum (Beijing, China) in June, the 11th China VCPE Semi-Annual Forum (Hangzhou, China) in July, and the China Clean Tech Congress 2011 (Shanghai, China) in August. He will also be speaking at ChiNano (Suzhou, China) in October.

Applied Ventures also hosted an event, *Bursting the Bulb: Solid State Lighting and Energy Efficiency*, at Applied Materials' Santa Clara campus. This event focused on solid state lighting technologies, and the discussion focused on the rapid changes and opportunities in California's lighting market. Keynote remarks were given by leaders in lighting and energy efficiency, including Dian Grueneich, Partner at Morrison & Forrester and former CPUC Commissioner, Peter Ngai, award-winning lighting technology expert and Matthijs Glastra, Chief Operating Officer at Philips Lumileds. The highlight of the event was a technology panel discussion, moderated by Robert Walker, Partner, Sierra Ventures, which included Karen Oweyung, CEO, Lunera Lighting; Kosta Papamichael, Co-director, CA Lighting Tech Center, UC Davis; Mark Swoboda, CEO, Intematix; David Leonard, CEO & Founder, Redwood Systems; Mikhail Haramati, Regulatory Analyst, CA Public Utilities Commission; Brent Marsh, CEO & Founder, Eutricity; and Brian Hubert.

Thank you for all your questions and comments from the last newsletter, and for your continued support and interest in Applied Ventures.

J. Christopher Moran,

*Corporate Vice President General Manager, Strategy,
Corporate Affairs, Marketing
Applied Ventures, LLC
Applied Materials, Inc*

RECENT PORTFOLIO NEWS

04/18/2011

[ClearEdge Power's Fuel Cell Systems installed at Universal Studios](#)

06/14/2011

[Illumitex raises \\$13.5M for LED lighting](#)

06/17/2011

[Siemens Acquires Stake in the U.S.-Based Solar Company Semprius](#)

06/29/2011

[Adesto ramps CBRAM, with Altis Semiconductor](#)

08/02/2011

[Samsung acquires Grandis \(MRAM\)](#)

08/16/2011

[Adesto adds Spansion CTO to the team](#)

08/23/2011

[ClearEdge Power Completes \\$73.5 Million Financing Round](#)

09/06/2011

[MTPV Raises \\$6.5M Series B Financing](#)

09/08/2011

[Heat is a Terrible Thing to Waste](#)

10/12/2011

[Enphase Ships Its One-Millionth MicroInverter](#)

AV PARTICIPATION AT EVENTS

October

[ChiNano \(Suzhou, China\)](#)

November

[Grow-California Cleantech Innovation Conference \(Oakland, CA\)](#)

November

[Printed Electronics Conference \(Santa Clara, CA\)](#)

November

[24th NREL Growth Forum \(Denver, CO\)](#)

**FOR THE LATEST NEWS ABOUT
APPLIED VENTURES, VISIT**
www.appliedmaterials.com/about/ventures/news

ABOUT APPLIED VENTURES

As the venture capital arm of Applied Materials, Inc., Applied Ventures invests in early-stage technology companies which promise to deliver high growth and exceptional returns, while also providing a window on technologies that advance or complement Applied Materials' areas of core expertise. Our venture investments help to develop technologies and markets which stimulate the growth of applications for semiconductors, displays, solar PV, and related products and services.

Applied Materials is the global leader in nanomanufacturing technology solutions for the electronics industry with a broad portfolio of innovative equipment, service, and software products.

To learn more, view our website at www.appliedventures.com. For questions, comments, or for company executive summary submissions, please send us an e-mail message at applied_ventures@amat.com.