

NORTHEAST

MANUFACTURING NEWS

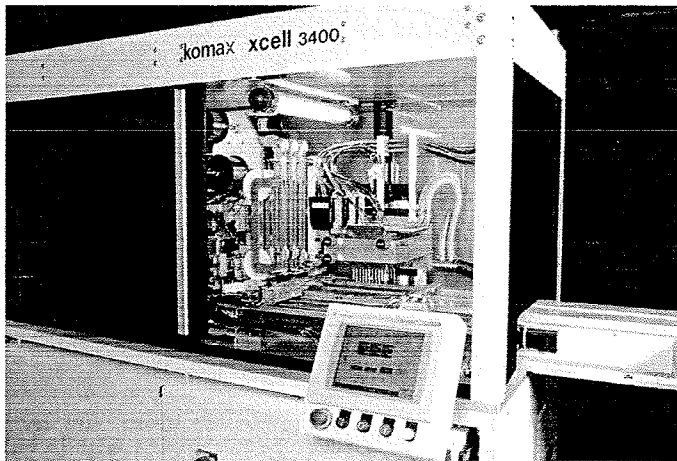
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Pennsylvania Alternative Energy



The Komax Solar Xcell 3400 is a solar cell interconnection platform automated stringer for solar cell manufacturing.

The Pennsylvania Department of Community & Economic Development (PA DCED) recently hosted a tour of some of the companies and organizations involved in the Pennsylvania energy sector located in and around the Harrisburg capital region.

"Pennsylvania is a leader in the growing alternative energy sector," said a PA DCED spokesperson. "Pennsylvania is investing \$650 million to expand the state's sector with a focus on alternative fuels, clean energy sources and new technologies, and energy efficiency."

"Pennsylvania is one of the top 10 states in job creation and in capital investment produced by energy projects," the spokesperson said. "The state is home to major wind and solar energy companies including Gamesa, Iberdrola, GE Wind, Conergy, AE Polysilicon, Flabeg and Plextronics, and there are more than 5,000 manufacturers in Pennsylvania contributing to the energy sector

and its supply chain. In the area of biofuels, Pennsylvania has an aggressive plan to produce and consume one billion gallons of homegrown biofuels. The target equals the amount of liquid fuel that the commonwealth will likely import from the Persian Gulf by 2017.

The Pennsylvania energy tour provided attendees the opportunity to visit several companies and manufacturers offering positive steps to assist with state, national and global efforts in alternative energy.

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At Keystone Biofuels, transesterification is the chemical process where the oil (triglyceride) is reacted with methanol or ethanol and a catalyst, such as sodium hydroxide or potassium hydroxide. This removes the glycerol molecule from the oil (triglyceride) and produces a methyl ester-biodiesel, and crude glycerin as a beneficial by-product.

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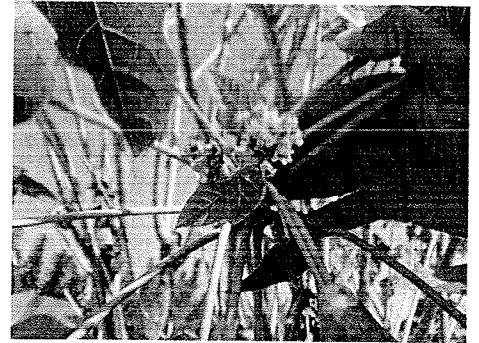
The Green Center of Central Pennsylvania is a partnership between Harrisburg Area Community College and GreenWorks Development. "The goal and mission of this collaboration is to change the way in which development is done in Central Pennsylvania," said Doug Neidich, CEO of GreenWorks Development. "Our goal is to rebuild live-work-play-and-learn integrated communities on brownfield, not greenfield, sites using innovative alternative-energy technologies such as solar, geothermal and wind."

Keystone Biofuels, founded in 2005 by Race Miner, is a manufacturer of biodiesel, an alternative fuel source and renewable diesel fuel substitute. "Keystone Biofuels is Pennsylvania's longest running biodiesel production facility and the first to use Pennsylvania grown products," said Dave Tielle, Keystone Biofuels director of biofuel development. "We use several feedstocks to produce ASTM certified B100 biofuel including soybean oil, which is provided by Pennsylvania farmers. Using state sources, this reduces Pennsylvania's trade deficit and creates jobs within the commonwealth in turn benefiting our economy. We also use waste vegetable oil (WVO) or yellow grease. Using WVO protects the environment and helps alleviate the nation's problems of over-burdened landfills."

Penn State Harrisburg is the future home of the recently announced \$1.6 million Central Pennsylvania Laboratory for Biofuels. Penn State researchers, led by Dr. Sairam Rudrabhatla, Ph.D., are working on developing an alternative fuel source from a hardy plant called jatropha. "Jatropha is capable of producing enough seeds in a single acre to make 202 gallons of biodiesel fuel without competing as a food source," said Dr. Rudrabhatla. The new lab project will consist of a 3,000 square foot biotechnology development and deployment lab and will also include a 3,000 square foot greenhouse complex.

Illuminex, founded in 2003 by Dr. Joe Habib, is a nanotechnology company based in Lancaster. "Our goal is to enable energy solutions with nanotechnology including processes for functional nanomaterials manufacturing, products utilizing core, nanowire array platforms and de-

vices for energy generation and storage," said Dr. Habib. "Illuminex developed and is refining processes used to produce high aspect, vertically-aligned, free-standing, uniform nanowire arrays on a variety of substrate materials using reliable, low-cost methods. These nanowires are attached, both mechanically and electrically, to an underlying substrate material forming a 'nano-bristle' network. Nanowires exhibit unique mechanical, optical and electrical properties due to their small size and we are leveraging these attributes to create new classes of functional materials," said Dr. Habib.



At Penn State Harrisburg, this jatropha plant is being researched and tested to be used as an alternative fuel source.

Komax Solar, located in York, is a global leader in photovoltaic manufacturing products. "We manufacture automation equipment used in the production of making crystalline solar panels globally," said Brian Micciche, Komax Solar president and managing director of the crystalline business. "Our vision is to supply leading technology to help drive the solar industry. We use unique expertise to determine and provide the optimal assembly process for our client's solar modules. By implementing our best in class technology, we ensure that our clients receive a cost-efficient solution that consistently delivers both precision and quality in our solar cell manufacturing equipment," said Micciche.

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