



Start-up mPower targets space industry for commercialization of Sandia solar cell technology

After a complicated technology transfer process involving a sprawling intellectual property (IP) portfolio and a start-up launched by former laboratory employees, Sandia National Laboratories' Microsystems Enabled Photovoltaics (MEPV) high efficiency solar cell technology is poised for commercialization.

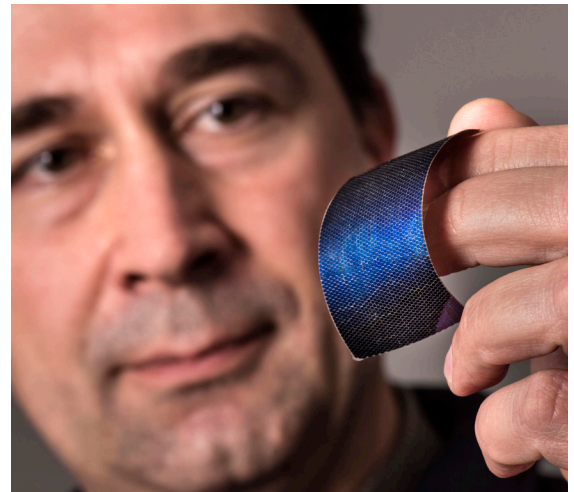
Currently being further developed and marketed by Albuquerque-based start-up mPower Technology, the MEPV technology is now called DragonSCALES™ (SemiConductor Active Layer Embedded Solar). mPower plans to introduce the technology to the space solar power market for low-Earth orbit satellite constellations, an initial demonstration intended to facilitate the technology's introduction into larger, more cost-sensitive markets like rooftop or utility-scale solar energy.

Like more typical solar cells, MEPV solar cells are made from silicon. But while traditional, large format solar cells are quite brittle and fragile, the MEPV cells are small and interconnected, making them foldable and almost unbreakable. MEPV cells are efficient to manufacture since they combine advances in photovoltaic cell design with mature microsystem production and manufacturing techniques.

The small size reduces material costs while enhancing cell performance. It also provides the freedom to integrate solar power capability into everyday objects. The technology's potential applications include buildings, houses, clothing, portable electronics, vehicles, and other contoured structures.

Three Sandia employees from the original MEPV development team left the lab to start mPower Technology in 2015, taking advantage of Sandia's Entrepreneurial Separation to Transfer Technology program (ESTT). In March 2015, Sandia and mPower entered into a nondisclosure agreement, and in April they entered into discussions for a License Option Agreement (LOA) for some of the MEPV portfolio related to the mPower business plans.

An LOA for 20 patents and patent applications in the MEPV portfolio was executed between Sandia and mPower on August 24, 2015. The LOA included business milestones that mPower had to achieve in order to be able to exercise the option and a longer than normal timeline for mPower to reach these milestones. The LOA also included a unique feature: among the 20 patents was a group that



Above: Scientist Murat Okandan left Sandia National Laboratories to start mPower Technology Inc., whose primary product is Dragon SCALES, small, lightweight, flexible solar cells that fit into and power devices or sensors of any shape or size. Okandan, who signed a licensing agreement with Sandia, shows a prototype here. (Photo by Randy Montoya)

Sandia agreed to not license for six months while mPower determined whether it needed them or not.

A full commercial license for 17 patents, 11 of those (seven U.S. and four foreign) partially exclusive for a period of five years and the other six nonexclusive, was executed on January 23, 2017. The license was executed in just four months, a very short time period for a license of this complexity. That license has been amended four times, most recently in December 2019.

mPower has received a \$1.1 million Army Small Business Innovation and Research (SBIR) grant for portable remote power requirements and raised \$4.35 million in Series A round funding. mPower recently delivered a demonstration unit to Airbus for its Sparkwing product, which was integrated into the upcoming December 2020 launch of the Momentus Vigoride platform.

The excellence in the technology transfer with mPower included aspects unique to this large patent portfolio and its potential markets. Initial protection of the IP in both the U.S. and foreign countries and a long option period were combined with sublicensing rights for mPower, but only when coupled with patents it subsequently developed. The license also was structured with different royalty rates and requirements for four different markets mPower was initially pursuing. ☺