

## **A DoD SBIR SUCCESS STORY**



### Nanostructured Thin-Film Solar Cell Production

#### Company Background

Nanosolar, founded in 2001, is establishing itself as a leader in solar power thin-film development. The company is working on both military and civilian applications. Nanosolar is headquartered in Palo Alto, California, with operations in Germany and China. At the end of 2006, the company began to build manufacturing facilities in San Jose, California and near Berlin, Germany.

#### Innovative Technology Developed

Maintaining enough power to keep communications flowing and equipment functioning is a vital issue for the warfighter, especially in remote or hazardous situations. There is a critical need for low-cost, durable solar modules that provide portable power sources without the need for energy re-supply.

Under a DARPA funded SBIR program, Nanosolar developed improved production techniques to create high-efficiency solar cells that are lightweight, flexible, durable, cheap, and easy to produce. Nanosolar is applying a new technique in the emerging field of nanotechnology to address critical power shortcomings: efficiency, durability and availability. This technology can extend mission durations, increase the range of mission distance, and minimize supply chain logistics and the personnel risk typically associated with re-supplying power sources.

Nanosolar has developed a way to produce rolls of thin-film solar cells that are printed directly on the substrate material with an ink made up of tiny nanoparticles containing the proper ratio of elements required to make the cells absorb solar energy. This technique has required innovations in seven different areas to dramatically improve the cost-efficiency, yield, and throughput of thin-film solar cell production: nanostructured components, printable semiconductors, printable electrodes, rapid thermal processing, low-cost substrates, roll-to-roll processing, and fast assembly.

These contributions would not have been possible with earlier solar power technologies—first generation siliconwafer solar cells, or the second generation commercial thin-film solar cells.

DoD Implementation and Commercialization Summary Funding from DARPA has also aided Nanosolar in raising additional private equity capital. In 2006, Nanosolar completed a Series C stock financing, which brought in over \$75 million.