

The World's Top Ten Clean Technology Companies

Alta Devices (USA)

Alta Devices manufacture highly efficient solar devices, where other companies have met with failure. Since its founding in 2007, Alta Devices has concentrated on making consistent strides in solar cell efficiency.

Decades of Technology

Since the advent of residential solar panels almost 50 years ago, no big changes have come along. The panels are rectangular, glass-coated, heavy objects that are labor-intensive and expensive to install. Ideally, panels should be thin, bendable, visually and environmentally gratifying.

Those attributes are going to make the installation costs disappear entirely. When the ideal becomes real, it will bring about the most important opportunity for solar. Every structure becomes energy independent by seizing the sun's rays in an effort to use less electricity.

Surplus power returns to the grid to satisfy peak demand. Solar cells with sufficient high energy have the ability to integrate into various roofing material.

Photovoltaic Cell Efficiency

Photovoltaics absorb photons that boost the activity of electrons inside semiconductors thus releasing those electrons to create a current. In the process, free-flowing electrons have ways to become waste, especially in the heat.

Alta Devices incorporates gallium arsenide in its process and allows the electrons to combine differently and begin the process all over again. Alta uses this information to design solar cells that take advantage of this recycling anomaly. This provides them with opportunities to recapture photons that can then convert into electricity.

Gallium Arsenide Solar Technology

There is a viewing window allowing investors to look into the development lab. The first piece of equipment they see is a lengthy machine that processes sample batches of thin-film solar cells. Automated production is convincing evidence that machinery can produce large yields necessary for use in real world manufacturing.

Alta's goal is to produce thin-film solar cells capable of efficiently converting sunlight thereby providing the path to inexpensive solar power. This can help Alta predict the general widespread use of solar technology for renewable energy power. Gallium arsenide absorbs far more sunlight than other flexible thin films in use for this intent.

Performance-Enhancing Materials

Silicon was previously in use as the semiconductor converting sunlight into electricity. It was expensive, less efficient and costly to manufacture. The two founding scientists at Alta did research that led to the development of a technique for enhancing the performance of the solar cells. Gallium arsenide became that technical development.

Gallium arsenide is efficient, fast and more sensitive to sunlight at any level. Early research brought to light big differences between the performance of silicon and gallium arsenide thin film solar cells. Silicon absorbs less sunlight, can fail in heat greater than 25°C and the low light situations of early morning or late afternoon made it lose ability to produce and retain electricity.

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Before they take on the electrical grid, Alta Devices has consumer electronics as its next big target. Alta pursues methods of making money without using traditional silicon solar panels or fossil fuel plants. The United States military began buying their solar panels to power small, unmanned aerial machines.

By the end of 2013, this company plans to bring an iPad cover to marketplace. It will be so powerful that electricity will be unnecessary. Solar iPad accessories are already available, but they do not produce sufficient capacity.

Silicon solar cells convert less than 20% of sunlight energy into electricity whereas Alta Devices solar cells are coming up to 30% efficiency. Alta's gallium arsenide material facilitates iPads to generate 10 watts of power in complete sunlight, which is equal to plugging the iPad into a socket. This company is moving to complete portability where connecting even to recharge will be unnecessary.

Another application Alta is pursuing for future use is incorporating solar cells into solar roofing shingles currently in production by Dow, an Alta Devices investor. Alta solar cells have potential to triple the power generation of solar shingles that Dow is making. Alta claims their technology would allow residential homes to generate more power than they would ever use (9 kilowatts).

Honors and Awards

growth. In 2009, the Energy Department selected Alta for a \$3 million grant, part of the SunShot Incubator Program, supporting technology offering significant cost savings in solar energy. The Department of Energy contributes information, research and goals to Alta Devices in an effort to enhance the work and technology already in progress.

For More Information

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