NREL Study Shows Alta Devices Solar Material Retains Very High Efficiency at Elevated Temperatures and Operates up to 10 Degrees Cooler Than Silicon in Real-World Conditions

Substantial Benefits for Automotive and other Roof-Integrated Applications

Business Wire **Press Release**: Alta Devices — Thu, Jun 20, 2013 6:00 AM EDT

TAMPA, Fla.--(BUSINESS WIRE)--

The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) and Alta Deviceshave jointly demonstrated that Alta's solar material retains its high efficiency in real-world conditions, particularly on hot days. The primary reason is that Alta's modules stay cooler and lose very little efficiency as the temperature rises. Combined with Alta Devices' energy densityadvantage, this has the potential for significant benefits, specifically in roof-integrated applications such as automobiles and buildings.

According to Sarah Kurtz, PhD, Principal Scientist, Reliability Group Manager of NREL, "To truly understand how much energy a particular solar technology will generate, it's critical to know how it performs in real-world conditions. Alta's ability to retain its efficiency advantage at hightemperature is an important benefit. For years, the industry has desired a very efficient solar cell that could be built into the roof of a car or building without paying the performance penalty associated with a hot roof. Alta's technology provides a fresh approach to these attractive applications by naturally rejecting heat and being less sensitive to high temperatures."

In a paper presented at the IEEE PVSC (Photovoltaic Specialists Conference) this week, the NREL-supervised tests and results were described. The tests were conducted at NREL's outdoor testing facility in Golden, Colorado, measuring energy and operating temperatures over a nine-week period. The result was that the Alta Devices module operated cooler than conventional modules (up to 10° Celsius cooler when the sun was brightest) and the Alta module was about five times less sensitive to increased temperature. In fact, because of changes in the sun's spectrum associated with hot days, the Alta module showed higher efficiencies on hot days than on cold days. In a simulation model using measured temperature coefficients (neglecting spectral effects), compared to a silicon module with the same power rating, the Alta module was predicted to generate 8% ±2% more energy per year in Phoenix, Arizona. To the extent that these simulations were performed based on a rack-mounted configuration, it is expected that roof-integrated installations will show even greater benefit. (For more information, see Alta blog at http://altadevices-blog.com, and the original paper presented at PVSC at http://www.nrel.gov/docs/fy13osti/57902.pdf)

Benefits for the Automotive Industry

According to Alta Devices president and CEO, Chris Norris, "We are always excited about these kinds of results because of what they mean to customers and users benefiting from our products. This advantage is key for any roof-integrated application of Alta Devices products. Up until now, integrating PV material directly into a roof of any kind resulted in additional heat needing to be dissipated, and a reduction in power output in the hottest part of each day, usually when you need it most. Our technology addresses both of these problems."

For example, the roof of a hybrid electric vehicle outfitted with an Alta Devices based solar array to generate electricity from the sun will run cooler, and continue to perform well in higher temperatures versus a silicon-based roof. This provides more overall energy and allows the interior of the car to stay cooler, further reducing the power demand for air conditioning. Norris explained, "Our technology delivers tangible economic benefits to automobile manufacturers by helping them meet the latest CAFE standards while providing real-world benefits to the end users."

About Alta Devices

Alta Devices is (EM)POWERING THE UNPLUGGED WORLD™ by delivering the world's most efficient, thin and flexible mobile power technology. Converting light into electricity, Alta's technology extends the energy source of a system, and in many cases, completely cuts the traditional power cord. The solution can be completely integrated into the final system, and is ideal for use in unmanned systems, consumer electronics, automotive, remote exploration, or anywhere size, weight, and mobility matter. Alta Devices holds world records for energy conversion efficiency[1], and has received funding from, Kleiner Perkins Caufield & Byers, August Capital, Crosslink Capital, AIMCo, GE, Dow, and others. Alta Devices has also received support from NREL's PV Incubator program. The company is headquartered in Sunnyvale, CA. For more information, visit http://www.altadevices.com.

Editors Notes:

1. Alta Devices holds the following records: single junction solar cell efficiency record at 28.8%, single junction module efficiency record at 24.1%. All records are under one sun and validated by NREL.
2. All trademarks and registered trademarks are those of their respective companies.
3. For more graphics or technical information, please contact Roeder-Johnson Corporation at http://email.roeder-johnson.com

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