

Devices is going after 30% PV efficiency at 50 cents per watt

Alta Devices: Next Gen PV Challenges Status Quo

Alta Devices is going after 30% PV efficiency at 50 cents per watt; we learn a few things from Alta insiders and patents—and I eulogize Gen 2 solar.



We've reported on the scant details known about stealthy Alta Devices [a few times in the past](#). We talked about solar startup [stealthiness](#) and we covered their \$3 million in NREL solar incubator funding [here](#).

Alta Devices received \$3 million in funding from NREL as part of the DOE's Photovoltaic Incubator Program "to support the development of early stage solar energy technologies and help them advance to full commercial scale," as per the DOE website. According to the DOE announcement, Alta Devices will focus efforts on developing an innovative high-efficiency (>20%), low-cost compound-semiconductor photovoltaic module, with market entry expected in 2011.

A recent job posting described the company in this manner:

"Alta Devices looks to develop solar cells up to 30% efficient at a module cost below 50 cents per watt. Alta has developed a unique and foundational thin-film technology that delivers the world's highest efficiency/lowest cost solar modules. Alta's solar cells are based on high efficiency compound semiconductor materials and proprietary manufacturing equipment to grow thin film solar cells. The technology is compatible with both rigid modules and roll-to-roll processing.

Founded by renowned solar experts [Harry Atwater of Cal Tech](#) and [Eli Yablonovitch of](#)

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[UCB](#), Alta has filed 23 patents and has assembled a world class solar technology team of 11 PhDs, eight of which are from Cal Tech and MIT. [Yablonovich was also the discoverer of photonic crystals]

Alta is well-funded by premier venture firms Kleiner Perkins, Caufield & Byers (Bill Joy), August Capital (Andy Rappaport), Crosslink Capital (Alain Harrus), New Enterprise Associates (Forest Baskett) and Technology Partners (Ira Ehrenpreis) with a Series B financing concluded 4/1/09. Alta has 24 employees and is headquartered in Santa Clara, California."

We've learned that \$2 million of the funding came from August Capital in 2008. And an insider has told us that the company has achieved over 20 percent efficiency in the lab. The company has confirmed this figure, as well as their price and efficiency targets.

Here's a sampling of their personnel and ex-personnel:

[Stewart Sonnenfeldt](#) was the founding CEO according to LinkedIn, and his name is on a number of Alta's patent applications. I asked Sonnenfeldt for some information on the firm and he was characteristically uncommunicative. Sonnenfeldt was briefly CEO of rooftop CPV startup Soliant.

The current CEO and president is [Christopher Norris](#), a former Venture Partner at Blue Run Ventures and long-time Cypress Semiconductor executive.

[Andy Hegedus](#) is a Senior Scientist at Alta Devices. He had a long history at Applied Materials.

[Gregg Higashi](#), the Managing Director, was formerly at Applied Materials and Intel.

Other personnel come from SoloPower, such as [Joseph Foster, VP of Business Development](#).

A recent article in [Nature Materials \(Vol. 9, p. 239\)](#) cited another technology being investigated by Atwater and his people: Microscale silicon rods...poured into a polymer containing light-reflecting nanoparticles....The polymer scatters unabsorbed light back onto the rods and this, combined with a silver reflecting layer at the bottom of the device, allows the cells to absorb up to 85 percent of incoming light. This is not the technology being commercialized at Alta.

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A look at some of the Alta patents reveal the technologies being investigated:

This [patent](#) clearly identifies the use of GaAs, AlGaAs, InGaP and alloys thereof in the Alta Devices tool kit.

The [epitaxial lift-off technique pioneered by Yablonoich](#) has yielded 26.1% thin-film GaAs solar cells in this [research](#) by Bauhuis, et al.

And, of course you'll need to patent [custom CVD equipment](#) to accomplish these feats.

Gen 2 solar firms like MiaSole, NanoSolar, SoloPower, Solyndra, Abound Solar, etc., contrary to Shyam's "[binomial distribution -- somebody has to succeed](#)" conclusion, have their work cut out for them. Crystalline silicon-based module vendors are going to relentlessly reduce price per watt by raising efficiency, lowering material cost, manufacturing and assembly costs, lowering balance of plant cost, lowering installation costs and gaining economies of scale. First Solar is in this mix in a big way, although there are some voices that claim their run at cost reduction is going to hit a wall real soon. We'll revisit this First Solar issue later this week.

In the meantime, I would suggest that the only way a PV aspirant can compete with China Solar Inc. and First Solar is with a cost model that blows away the c-Si cost trajectory -- fifty cents per watt sounds right -- and with an efficiency that changes the balance of system cost model. Maybe one these Gen 3 firms -- Alta Devices, Stion, Solixel, a firm yet unstealthed or unfounded -- can get this done.

Without those achievements -- significant cost advantage and significant efficiency gains -- these Gen 2 solar firms are doomed slow-motion train wrecks. A few might create wealth for investors or founders, but I doubt any will create lasting value.

(article image: Caravaggio's David and Goliath)

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