

TAKING THE NANOPULSE

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Batteries are a right-now application that can make a difference today.

Energy: **STORING IT** is what Matters

Nanotechnology and batteries are natural partners in our drive for energy independence

BY SCOTT E. RICKERT

Oil prices have retreated from the stratosphere -- temporarily. Fortunately, that hasn't slowed the momentum behind America's pursuit of energy independence. Economic stimulus funds are on the table. Leaders from government, business, green organizations and consumer groups are focused on putting the U.S. more in control of its energy destiny. Frankly, some of these solutions are years (maybe decades) in the making. But that's ok -- because one is a near-term sure thing, thanks to nanotechnology.

Batteries. Yes, batteries. Currently, they're generally big, clunky, inefficient afterthoughts in the energy blueprint. We need to move them front and center. Why? Batteries are a right-now application that can make a difference today.

Better batteries are the linchpin of alternative energy -- now and in any future scenario. Wind and solar are intermittent energy sources. Since Mother Nature isn't on any utility's payroll, we'll never be able to follow the traditional production model of cranking up our "generators" when demand is high. That means we have to be able to efficiently capture all the energy we create -- whenever we have the opportunity to create it. Dependable, high-performance, cost-effective batteries are the key to integrating real life with the power grid.

Want to reduce America's dependence on foreign oil? Not by a little -- but by an order of magnitude? Then get the battery technology in gear. Batteries for electric and hybrid vehicles need to hold more juice, charge faster, last longer and cost less

So how do we get there? The high-voltage solution is partnerships between battery and nanotechnology companies. Nano-science is providing breakthroughs that power batteries over the technological hurdles that have stymied our best efforts until now.

Let's start with some market-ready examples. Altair Nano, is making progress with batteries that help build a smart-grid power system, balance the intermittency of solar and wind power, and provide longer-lasting solutions for electric vehicles. A123Systems, a company that's used nanotechnology in high-efficiency batteries for battery-powered tools and the like, is another company making a difference today. They already have partnerships with top American and European car manufacturers and have a foothold in power grid applications as well.

And that's just the start. Research at one university points to batteries that could be 10 times more efficient than anything currently on the market. Another research group has developed a way to put battery storage into an ultrathin film. This quick-charging battery has the potential of an amazing 40x improvement in efficiency. And here's my favorite. Another group has created a system that uses coated nanotubes that line up like the coaxial cables that hook to the back of your TV set. The coating provides high-capacity energy storage, and the highly conductive nanotubes help boost energy flow. The whole system can be housed in a thin, flexible film. They'll be a small, light, powerful solution -- whether they're used on a corporate wind-farm, under the hood of your hybrid, or a power source for your laptop and cell phone built into the fabric of your favorite jacket.

So what can your company do to "get a grip" on your power? If you're a battery company, the answer is obvious: start a partnership with a nanotech company. That's where the big ideas will come from. But there are power-full partnerships for mainstream business, too. What do you make that should be nano-battery powered? Your needs and knowledge could jumpstart a new product – the lifeblood of technology innovation. What power systems in your process could be a more energy efficient? Become a beta test site for technology development.

In other words, create demand. And supply the resources to respond. The benefits will be quick and substantial. Nanotech-powered solutions will be good for the country, the economy, the planet – and your business.

Next month: more on energy. Let's get practical about wind and solar generation. How can nanotechnology improve efficiency, durability and life expectancy?

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