

# Best of Both (Battery) Worlds

## Technology Seeks to Boost Performance, Reduce Costs

By Tom Schuman

**W**hen a major corporation announced in 2008 that it was going to study whether it was possible to blend the power generated by two different energy sources, the crew at Indy Power Systems paused, smiled and went back to work.

Steve Tolen, CEO of the Noblesville-based company, actually admits his team “snickered” just a little. He adds, “We were way ahead of the curve on this, before it was cool. But no one ever looks to the smaller start-ups” to develop and implement such solutions.

Indy Power Systems, founded in 2007, has developed the Multi-Flex™, a proprietary hardware and software energy management system. In April, it demonstrated its concept in a golf cart, moving energy between a 55-volt lithium-ion battery and a 48-volt lead-acid battery pack. Next up is developing a production version for use in the transportation, electrical device and electric utility grid industries.

Bill Wylam, a member of the Indy Power Systems’ board of managers, retired in 2005 after a 50-year career that began with the Delco Remy division of General Motors (GM) and included developing the propulsion system for GM’s EV1 electric vehicle. He explains the technology in simple terms.

“Some batteries are good on power; some are good on energy,” he told the audience at the April demonstration. “When you try to put both in the same battery, you have to make compromises. This allows you to switch between the two batteries.”

Tolen, whose extensive financial background includes starting Symphony Bank of Indianapolis in 2005, adds that the hope for so long was finding that “perfect battery chemistry. But by blending the two or more (power sources), you hit a better price-performance curve. And that’s what everyone is looking for.”

The ultimate target is to improve the cost and efficiency of hybrid and electric vehicle batteries. Potential savings are estimated at more than \$10,000 per highway capable vehicle.

### Going to market

Foresight Science & Technology, a research and consulting firm, projects a \$2 billion market for the Indy Power Systems’ product by 2015. Tolen believes it could be even larger than that, with his company positioned to secure a significant share. The automotive world, however, moves slowly – particularly in today’s economy.

“The reason we don’t start off with major automotive – their model is broken right now,” Tolen affirms. “Unless you develop something internally and prove it, they’re not interested. We’re going to go out and do that (prove it).”

To illustrate his point, Tolen (with absolutely no intrigue) says, “We’ve talked to one company in what was formerly known as the Big Three that is not contemplating Chapter 11 bankruptcy at this time, and they were curious. But they want to see more validation. Tier 2 manufacturers are very interested. We’ve been in discussions with one that is currently manufacturing electric vehicles in the \$30,000 range.”

Beyond the auto world, Tolen mentions a contract with a company that provides power systems to the military. Another partnership is in the works with Elkhart-based Godfrey Marine, which includes pontoon boats among its recreational offerings.

“We have the ability to completely move away from the internal combustion engine in the pontoon boat. There would be more power; it would be quieter and more environmentally friendly,” Tolen notes. “We think we can have it tested and a prototype ready within nine



Next up is a production version of the Multi-Flex™ energy management system.

months. That would create probably 15 high-paying engineering jobs and 25 technical employees just on one product line (for Godfrey)."

### No time like the present

Wylam and Brose McVey, also a member of Indy Power Systems' board of managers and a longtime public policy professional, both believe the time is right for this company and its offerings.

Pointing to Central Indiana's long history in battery and electrical technology in the auto industry, Wylam says the development of the electric vehicle began more than 30 years ago due to oil shortages. (The General Motors' research effort on converting electricity in batteries to fuel for a car was centered in Castleton on the northeast side of Indianapolis.)

"About the time we had it developed, the Arabs turned the tap back on and oil was \$9 a barrel," he recalls. "With the 9-11 (attacks), there was a whole new interest because of security. The electronics make it possible now at a reasonable cost, and we have a generation of young engineers (pointing to members of the Indy Power Systems team) who understand this stuff. The stars are aligned – this kind of transportation makes sense."

McVey, who feared Indiana was losing its competitive advantage in this sector in the mid-1990s, sees tremendous opportunity today.

"Bill (Wylam) calls it the Silicon Valley. I use the term Electric Prairie; we could be the Raleigh-Durham triangle for electric vehicles," McVey asserts. From Washington to Indiana and beyond, he views a "sea of change. We're all talking the same language. Everything is aligned, and we know something special is going to happen."

Bob Galyen, chief operating officer for the company, was also part of the EV1 team. Others, he offers, claim that was the second most complicated machine ever produced – behind only the space shuttle. He says the current engineers working for Indy Power Systems are the "most talented team I've seen since then."

Quentin Kramer serves as senior hardware engineer and Andrew Hintz is the senior software engineer. Both earned bachelor's and master's degrees from Rose-Hulman Institute of Technology and brought with them industry experience from other companies.

### Financially speaking

Tolen terms it a "healthy curiosity" that got him interested in this line of work. "I had seen the transformation from the mainframe computer to the PC. I thought there were several parallels in going from electric

compulsion to battery power and wondered why it hadn't happened."

An affiliation with the Purdue Research Park provided business plan, marketing and consulting assistance. Although an initial round of private funding was secured, Tolen hopes more resources can be obtained to accelerate the progress.

"What we're hoping for with a (21st Century) grant (from the state) is to be able to hire additional people and speed things up," he states. "There has always been a little different approach in Indiana with funding available for growth of existing companies but not so much seed capital."

He reveals that the company has been approached by leaders of California venture funds, but the goal is to create jobs and opportunity here in Indiana. How successful Indy Power Systems and other recent technology-related start-ups are in doing just that will play a major role in the state's economic future.

#### INFORMATION LINK

**Resource:** Indy Power Systems at [www.indypowersystems.com](http://www.indypowersystems.com)



Steve Tolen (top) brings his financial knowledge to the company; Bill Wylam (center) has more than 50 years of experience in the automobile industry; and Quentin Kramer (bottom) is a Rose-Hulman graduate and hardware expert.

