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Battery-powered car race is on

Despite current cost and safety concerns, automakers see plug-ins and hybrids as remedy to future $5-a-gallon gasoline

By Rick Popely

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The latest potential alternative to the traditional gasoline engine touted for the auto industry—plug-in hybrids and their lithium-ion batteries—may not change what most people drive anytime soon.

Among those cautious about the potential for both is a company that should know: Toyota Motor Corp., the world's largest producer of hybrid vehicles.

Toyota will introduce two new hybrids in January at the Detroit Auto Show, and both will use the tried-and-true nickel-metal-hydride battery that helps power its Prius. Neither will be a plug-in, whose batteries can be recharged in a household outlet.

Still, the race is on to develop lighter, more powerful lithium-ion batteries, despite obstacles including cost and safety concerns, said experts at a conference in Chicago hosted by the Association for Corporate Growth on Tuesday.

Lithium-ion batteries have exploded and caught fire in laptop computers and are four to five times more expensive than other batteries.

Calling electric-based vehicles "the only sustainable solution" for the auto industry, Said Al-Hallaj, head of renewable energy programs at the Illinois Institute of Technology, acknowledged safety concerns are real. "We don't want to make the front page for the wrong reasons. Let's step back and do it correctly."

General Motors Corp. and Toyota have announced plans to introduce plug-in hybrids in 2010, and both will use the lithium-ion batteries.

GM, which just this month gave the plug-in Chevy Volt the final go-ahead, says the Volt will have a range of 40 miles on electric power, so motorists who drive less than that between charges won't use any gasoline. After the batteries drain, the Volt's gas engine recharges them, adding another 600 or so miles to the vehicle's range.

GM says it has overcome the safety issue with a lithium-ion chemistry that avoids the high temperatures that led to explosions.

Automakers also are experimenting with fuel-cell vehicles such as the Honda FCX Clarity that use hydrogen to generate electrical power, but so far they have only built small test fleets. Analysts doubt fuel-cell vehicles will be sold in volume before 2015 because there are few hydrogen filling stations and fuel-cell cars currently cost more than $100,000 to build.

Toyota hasn't identified its plug-in, though analysts expect it will be a version of the Prius. Spokesman John Hanson dismissed safety concerns by saying, "We're not going to put out a battery that's going to catch fire. We think that is probably easily solved."

But the cost of the batteries is an issue at Toyota. Hanson would say only the automaker expects them to cost far more than the nickel-metal-hydride batteries in the Prius, which run about $3,000 to replace.

Paul Boskovitch, chief engineer of hybrid systems for auto supplier Ricardo Inc., ventures that lithium-ion batteries needed to power a vehicle now run $10,000 to $15,000, which would make such a vehicle's price prohibitive.

The success of the Prius—more than 1 million sold worldwide and 277,000 in the U.S.—also gives Toyota little reason to go full-tilt to plug-ins. The sophisticated hybrid system in the Prius operates seamlessly to recharge the batteries while moving.

The plug-in Toyota is working on will have a range of 10 to 15 miles on electricity and then operate like the Prius, so the benefits to its owners may not be as great as those of the Volt.

And while GM intends to mass-produce the Volt from the outset, Toyota will start by leasing a few hundred plug-ins to fleet customers.

"We need to see how lithium-ion batteries perform in the real world and make sure this technology is robust and what they need," Hanson said.

"I'm not surprised," Al-Hallaj said of Toyota's stance, because it builds 280,000 Priuses per year. "They've invested a lot in nickel-metal hydride, and it works. From a strategic point of view, they're hedging their bets."

Al-Hallaj, though, said lithium-ion has potential to become the standard for hybrids and plug-ins because of its greater power. He also said its price will drop as production increases.

"This will take time, but look how quickly computers went from costing thousands to a few hundred dollars," he said.

Ford Motor Co. also is being deliberate with lithium-ion technology, testing 20 plug-in Escape hybrids before deciding whether to put it into wider production.

"A plug-in is a very expensive solution," Ford research manager Ted Miller said, adding it takes more batteries than a non-plug-in. "It's better to have a real market that's sustainable, but that's not certain at this point."

Spiking gas prices make Ford more bullish on hybrids. Miller said if gas hits $5 a gallon, as some analysts predict, "everyone will consider a hybrid, and we may not be able to meet all the demand."

Ford expects U.S. hybrid sales to reach 500,000 this year, about 3 percent of the market, and that could triple to about 10 percent in a few years if gas reaches $5 a gallon and stays there.

But Miller sees annual plug-in sales only in the thousands until 2015.

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