

Micro Hybrids Bring the Benefits of Start-Stop Engines to Everyone

Micro hybrids are big business in Europe, and they could soon be coming here. Conversion kits are also a real possibility for retrofitting standard cars.

By Jim Motavalli



PowerGenix says its nickel-zinc batteries in a Prius delivered lower weight and cost. (PowerGenix photo)

We have Microsoft, micro-skirts, micro-turbines, but do you have any idea what a micro-hybrid is? I didn't think so. But there may well be one in your future.

Micro-hybrids are not tiny cars with gas and electric drivetrains, though those are a good idea, too. Instead, it's a conventional car that incorporates one of the best features of the hybrid -- the technology that starts and stops it at stoplights. If you've ever driven a Toyota Prius, Ford Fusion Hybrid or something similar, you've experienced its nearly seamless shutoff and effortless restart when you lifted your foot off the brake. It raises the cost of the car by something like \$300 to \$500, but in some cases (particularly city driving) it can boost fuel efficiency by as much as 15%.

[A study by Controlled Power Technologies and AVL](#) says that micro-hybrids can save as much as 25% in fuel economy and carbon dioxide emissions "while maintaining acceptable levels of driver enjoyment." Start-stop won't really impact your time on the road too much. The authors of the study put their start-stop tech into a VW Passat with a two-liter engine and got 36 mpg out of it, as well as the CO2 performance of the Passat TDI clean diesel.

Valeo, which supplies start-stop to European carmakers, estimates that most vehicles spend a third of their time on the road not moving. Their engines don't have to be running while they're just sitting there.

There aren't any micro-hybrids on the U.S. market right now, largely because U.S. fuel economy rules stubbornly refuse to give carmakers credit for installing the systems. But there are millions of micro-hybrids on European roads (from BMW, Peugeot, Mercedes, Mazda, Mini and many others). Europe could have five million of them by 2015, and by then the market in China (a big fan of the technology) is expected to grow to 20 million units, says Strategy Analytics Automotive Electronic Service. We should have fleets of them here soon.

It's also possible to retrofit start-stop to existing cars, and that could be a really good aftermarket solution. I'd pay, say, \$400 for a device that got me 15% better fuel economy (and CO2 reduction) over the life of my car.



About \$150 to \$200 of the cost of the system is a larger battery to handle the larger load from many thousands of engine starts and restarts. Also necessary is a relatively straightforward belt-integrated starter/generator to replace the alternator.

[A company called PowerGenix](#) argues that its nickel-zinc batteries are in the sweet spot for micro-hybrids, offering much more performance than the lead-acid cells now commonly in use, but priced far below the lithium-ion batteries

now going into electric cars.

Richard Brody, a PowerGenix vice president, said the company installed one of its \$150 to \$200 packs in a Prius, and got good performance as well as a one-third weight reduction and a 25% cost reduction. He also said that PowerGenix is "talking to" carmakers about being part of their micro-hybrid revolution, but he didn't name names. The Army is a customer, however, for a prototype battery that could go into military vehicles.

Right now, PowerGenix batteries, made in China, are used in consumer electronics, and they sell them as rechargeable AAs.

Nickel-zinc is one of the battery technologies out there that has yet to find a home in cars, but the micro-hybrid, low-hanging fruit for carbon dioxide reduction, just might be its niche.

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