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WHEELS

THE LOVINS SUPERCAR:
Much more like a computer with wheels than a car with a chip

By Simson L. Garfinkel

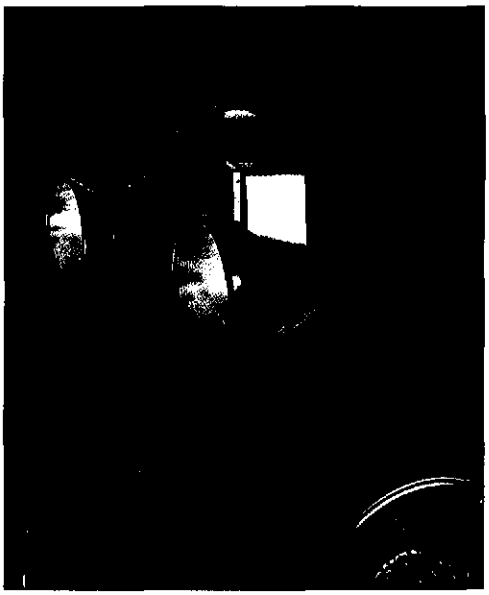
In the beginning, was the car: a big, beautiful, sleek, leisurely automobile, and the car was a 1929 Packard. In the next millennium, there will be a supercar: ultralightweight, safe, efficient, and built from high-tech composites. Which would you choose?

Even today's most modern cars represent refinements of yesterday's technology. They're the end products of a highly tuned process of designing, metal stamping, painting, assembling, and delivering that may be as outmoded and obsolete as the internal combustion engine that pushes them down the road.

Rather than looking for ways to make cars incrementally better—like more efficient tires, an improved engine, or better gas—a few scientists have developed a proposal for a quantum leap in automobile design: the ultralight hybrid supercar. It's the brainchild of Amory B. Lovins, director of research at Rocky Mountain Institute in Snowmass, Colorado, and one of the leading energy thinkers of our time.

The Lovins supercar of the near future would be nothing more than an aggressive application of nearly every automotive technology now available to reduce weight or improve efficiency. For example, while a supercar would have a tiny gasoline- or alternative-fuel-powered engine, it would use that engine to generate electricity to charge an onboard battery. The engine would run at its most efficient speed to charge the battery and then shut off. The wheels themselves would be powered by switched reluctance hub motors, which would double as regenerative brakes so that slowing the car would recharge the battery rather than turn the car's momentum into useless heat.

The supercar would be built from high-tech composites—carbon fiber, Kevlar, and glasses. Such a body would cut the car's weight by 60 to 75 percent. And while today's composites cost substantially more than steel, the final car need not. That's because composites can be produced ready to use: 85 percent of the cost of a steel part comes from the costs of shaping and finishing rather than from the cost of the metal itself. Since color can be molded directly into composites, supercars wouldn't even have to be painted. Assembly costs would fall by about 90 percent; tooling, by 50 to 90 percent.



Then there's the matter of drag—from both air resistance and tires. Both could be at least halved for significant savings. Put it all together, says Lovins, and you have a four-passenger car that could easily get more than 150 miles per gallon using technology available today. Yet it would be a safer car, since the superstrong, bouncy material and special structures would absorb the energy of a direct impact. In recent German tests, for example, a car weighing 13,200 pounds hit a wall at 25 miles per hour, and all the energy was absorbed by 2 to 4 pounds of composite cones.

And that's just the beginning. Create standard sizes, mounts, and connectors for such cars' major components—the power plant, energy storage, and motors—and then stand back as competition forces prices down and efficiencies up. Replacing a car's power plant would become as easy as replacing the hard disk of a personal computer. And what an upgrade! Swapping an internal combustion engine and lead-acid battery with a fuel cell and carbon-fiber flywheel could boost gas efficiency past 300 miles per gallon.

The big supercar players might stretch beyond today's auto makers. Look to companies that set software standards and build computer components—the future Intels and Microsofts of the car world. "Supercars would be much more a software than a hardware problem," says Lovins.

Likewise, you probably wouldn't go to a dealer to buy a supercar. Instead, the dealer would come to your house with a laptop computer and give you a simulated demo with a CD-ROM and a virtual-reality headset. The order would be sent by modem to the regional factory, where the precise car you wanted would be made to order. A few days later, the salesperson would drive your car to your house and take your old car back as a trade-in for disassembly.

Fantasy? Probably not. All of these changes happened to computers during the past 15 years. And the technology for supercars is already with us. ◻◻