

# OVONIC HYDROGEN SYSTEMS

*Enabling the Hydrogen Economy with Commercially Sustainable Solutions*

The dangerous dependence on oil and the concerns about pollution and global warming are spurring development of the *Hydrogen Economy*, and Ovonic Hydrogen Systems LLC — through its Ovonic metal hydride storage materials technology — is uniquely positioned to play the leading role. One key reason: the safe, low-pressure superior storage capacity of its patented Ovonic solid hydrogen storage technology, which enables the completion of the hydrogen loop. This loop is the generation of hydrogen, the storage of hydrogen, the utilization of hydrogen, and the infrastructure to support the *Hydrogen Economy*, all of which are addressed by ECD Ovonic's products.

The limitations of conventional hydrogen storage technology are well-established. Hydrogen takes up a lot of space per unit of energy. Storing enough of it to power, say, an automobile or onsite generator in a gaseous form currently involves compressing it in bulky tanks pressurized to 5,000 psi or more. Storing it as a liquid involves cooling to temperatures most consumers would find impractical. Both methods also present potential safety concerns.

The patented Ovonic® hydrogen storage systems are dramatically different and are solutions to the storage and infrastructure problems that have held back the fuel. Rather than storing hydrogen in a gaseous or liquid form, its metal hydrides work like a sponge by bonding hydrogen atoms to a metal alloy, forming a safe, compact, low-pressure storage medium. A tank with a metal hydride inside can hold three times more hydrogen than can be stored as a compressed gas in the same space. By utilizing our Ovonic solid hydrogen, one can make the infrastructure that is required for the *Hydrogen Economy* more practical.

To demonstrate the technology's potential, a hybrid sedan was converted to run on hydrogen, using our metal hydride hydrogen storage system. While fuel cell-based automobiles are the ultimate future of the *Hydrogen Highway*, our hydrogen storage system feeding the hybrid sedan's conventional internal combustion engine (ICE) and utilizing our Ovonic NiMH battery represents a milestone transition. Our modified hydrogen-electric hybrid sedan is a transformative step forward in technology and in public awareness. Its dynamometer test and recent road tests have been very successful, impressing key government leaders as well as receiving extensive coverage in trade media.

The Ovonic® hydrogen storage system is uniquely positioned to be the enabling technology for that first generation of commercially sustainable *Hydrogen Economy* products. To that end, we are embarking upon a focused beta site-testing of our technology with a goal of developing the first commercially sustainable, hydrogen-enabled product that will meaningfully improve global air emission regulatory compliance. Of great importance, it completes the hydrogen loop that starts with the sun whose light can be utilized by our PV solar cells to split apart water to provide the hydrogen that the world so crucially needs.



A hybrid sedan was converted to run on hydrogen using Ovonic Hydrogen Systems LLC's metal hydride hydrogen storage system.



Ovonic Hydrogen Systems LLC's solid hydrogen storage technology provides superior storage capacity.