

Seeing the Light

A new generation of high-power LEDs are about to make the future of automotive headlights a whole lot brighter. • By Alan Rider

ENTREPRENEUR GLENN STASKY has seen the future of automotive headlights, and it's looking a lot brighter than you might expect, thanks to a new application of decades-old technology.

"I think there's no question that all headlights will eventually use LEDs [light-emitting diodes]," says Stasky, whose Rancho Cordova, California, company Clearwater Lights has pioneered a line of sophisticated dimmable driving lights built around a new generation of high-power light-emitting diodes.

Small, colored LEDs have been used in cars for years. But it wasn't until relatively recently that the new larger, more powerful white version made LEDs a viable alternative to traditional headlight bulbs that, despite a few refinements, haven't changed all that much in a half-century.

"These new LEDs have a lot of advantages, but probably the most noticeable one is that they can be designed to put out a bright white light that makes even the latest generation of halogen headlights look kind of dim and yellow by comparison," Stasky explains.

The fact that these high-power LEDs last at least 50 times longer than the bulbs used in traditional headlights doesn't hurt either. While some of the dramatic longevity gains are due to LEDs having no filaments to break or burn out, much of the



credit goes to their greater efficiency, allowing them to run significantly cooler.

"The reason a 100-watt incandescent light bulb gets so hot is because it's terribly inefficient," says Stasky. "The 12-watt LEDs we use in our Krista driving lights are cool to the touch even though they're putting out four times as much light as the 55-watt halogen bulbs used in most new car models."

Like many emerging technologies, the main stumbling block standing in the way of widespread adoption of

LED headlights is cost. That's why you'll only find them on a handful of high-end 2011 models, including the top-of-the-line \$84,000 Cadillac Escalade Platinum SUV, the \$108,800 Lexus flagship LS600h hybrid luxury sedan, and Audi's \$114,000 R8 sports car.

Just as with the microchips that power everything from laptops to smart phones, Stasky believes the cost

of the new high-power LEDs will begin to drop significantly within the next few years. He also expects them to become smaller and even more efficient, which will help engineers incorporate them into a wide variety of future automotive applications.

"Because they draw such little power, I can envision LED lights being run entirely off a solar panel built into a car's roof," he says. "They're also physically small enough

that they'd be ideal for advanced headlight designs that automatically adjust the brightness and direction of a car's headlights to adapt to oncoming traffic and road conditions."

Even though these innovations are probably years away, Stasky says the future of automotive headlights is closer than most think.

"Every major automaker has people working on this right now," he says, "so it wouldn't surprise me if at least half of all the headlights you see on the road 20 years from now will be using LED technology."