Automobile manufacturers are turned on about LEDs (light-emitting diodes). The same technology that powers televisions screens, laptop keyboards, flashlights, Christmas lights and stoplights is lighting up the automotive world as the new standard to strive for in automobile running lights, headlights and taillights because they are effective, more energy-efficient and look very cool.

Manufacturers have been switching to red LEDs on taillights for several years. They allow distinctive arrays, more brightness and respond up to 10 times faster than conventional bulbs. Even a split second can make a difference when a driver needs to make an emergency stop at high speed. Automakers see that LEDs offer superior performance in headlights, too, and have some advantages over incandescent, halogen and even xenon lights.

The first advantage is that they almost replicate sunlight, providing better contrast while lessening eyestrain. That makes for increased driving safety. Audi’s vampire-themed ad during the Super Bowl showcased the LEDs brightness: the premise was that Audi’s LED lights were so much like the sun that they could – and in the ad, did – vaporize a bunch of hard-partying vampires. Audi has made LED daytime running lights and/or headlights available on most models.

A second LED advantage is that they last longer. Incandescent headlight bulbs have a lifespan of approximately 25,000 miles; halogen bulbs, last approximately 60,000 miles; Xenon headlamps last longer, and automotive lighting experts say that LED headlights will last the longest, outlasting the life of most cars.

A third LED advantage is that they are more efficient than other lighting technologies, and as auto manufacturers strive to boost fuel efficiency in new cars, lighting becomes increasingly important. LED bulbs are just a fraction of the size of other headlight bulbs. Instead of lighting up a filament (incandescent or halogen) or gas (xenon), LEDs light up by moving electricity across an electronic chip. It creates very little heat, which is actually wasted energy, so LED headlights are four times as efficient as halogen lamps, draining less energy from the electrical system.

With the new entertainment systems, power steering and electronic controls, automobile electrical systems are already taxed. LED headlights’ efficiency also will give electric vehicles greater range, up to six miles added to the driving range of an EV, according to one recent report. That’s significant when most EVs have a single-charge driving range of less than 100 miles.

Less energy use equals less fuel use and also less pollution. Audi, which has been the leader in LED use, says that in the first year it offered LED daytime running lights, CO2 emissions were cut by 25,000 tons. Imagine the pollution reduction when LEDs are standard on most new cars sold!

Finally, there’s the design factor. The New York Times quoted Stefan Sielaff, head of design for Audi, about how the automaker has used LEDs as a signature design element. Many Audi model use LEDs in unique, recognizable headlight configurations. “They look very high-tech and precise and accurate,” he said. “Each car needs a personality with lights.” LEDs can be round or tubular or individual bits of light and, according to Sielaff, offer endless design possibilities.

LED headlights made their debut a few years ago as an option in luxury cars like the Audi A8, the Cadillac Escalade and Lexus LS600H. Now they are showing up on lower-priced cars as they become less expensive to produce. Besides Audi, other manufacturers who now offer LEDs in headlights or daytime running lights include Chrysler, Kia, Volkswagen, BMW and Mercedes.

As LEDs are becoming mainstream, the next generation of automotive lighting is already under development. BMW says it’s developing laser lighting technology, which the German automaker says offers even more energy efficiency while producing more light. Laser lights are still a few years away from market. In the meantime, new-car buyers can enjoy the illuminating possibilities of LEDs.