Fuel Efficient Tires 101

Did you know that some car tires are more efficient than others? It's true; some tires use less energy as they roll along the road and therefore make your car, minivan, SUV or pickup consume less gas. Fuel efficient tires can be designed to use less energy while being just as safe and lasting just as long as other, less efficient models. Therefore, they are a great way to save some money at the pump and cut our oil consumption and carbon pollution from cars and trucks.

This blog post is intended to be a primer on fuel efficient tires. In the near future, I will discuss state and federal policies which aim to improve tire efficiency in the market.

Replacement Tires Are the New Market for Efficiency

Fuel-efficient tires have been around for many years. Automakers seeking the least cost ways of complying with fuel economy standards and have relied upon the tire industry to provide tires that will reduce fuel consumption during CAFE tests. Typically, these tires were made only for sale on new vehicles (so-called "original equipment tires"), so when you went to replace your new tires 3 or 4 years later, you were not able to buy the same, potentially more efficient model. Now, however, consumers are slowly getting more choices as fuel efficient models start to appear in the replacement tire market.

You Can Buy More Efficient Models Today

Michelin, Goodyear, and Bridgestone now offer tires positioned as more fuel efficient than other tires of similar size and load ratings. The challenge for consumers, however, is that the efficiency of the tires are measured according to proprietary methods, across different scales and with different labels that make comparing one brand to another nearly impossible. Fortunately, new government policies in California and the U.S. Department of Transportation are set to fix the information challenge (discussion reserved for future posts).

It's in the Rubber: Fuel Efficient Tires Cut Energy Losses with Improved Tire Materials

The technology to improve tire efficiency is in the rubber compounds that make up the tread and sidewalls. When you are driving along the road, tires must bend and deform to meet the flat contact patch on the road. After leaving the contact patch, the deformed section of tire will tend to return to its original shape. (This is similar to the reaction of a rubber band as it tries to return to its original size after being stretched around, say, a rolled-up newspaper.) However, repeated deformation of the tire as it rolls along the road inhibits the rubber's 'rebound' and the tire loses energy in the form of heat. Tire and rubber engineers discovered that new materials introduced into the sidewall and tread rubber compounds, such as silica or finely powdered recycled rubber, can reduce the energy losses. Furthermore, the rolling energy losses can be minimized while maintaining excellent road grip and tire life.

Fuel Efficient Tires Pay for Themselves in Fuel Savings

The energy losses in a tire that act to slow a moving vehicle (and cause it to consume more fuel) are referred to the tire's rolling resistance. Technically, the rolling resistance is defined as energy consumed by the tire per unit of distance. Lower rolling resistance values correspond to lower energy losses and lower fuel consumption. According a study by the National Academies of Science (pdf), a 10 percent reduction in rolling resistance can increase fuel economy by 1-2 percent. Among the replacement tires available on the market today, rolling resistance varies by more than 20 percent, which can affect fuel economy by as much as 4 percent. The extra cost of producing a set of four fuel efficient tires is about $8. If using fuel efficient tires improves your car's fuel economy by just 2 percent, you would recoup that $8 investment in just over 3 months, assuming a gas price of $2.50/gallon. Over a typical tire life of 3 ½ years, you would save over $100 in gasoline expenditures.

A National Fuel Efficient Tire Program Can Deliver Large Oil Savings and Reductions in Global Warming Pollution

A national tire efficiency program that uniformly rates and labels tires and that establishes minimum tire efficiency standards could save over 240,000 barrels of oil each day. That's more oil than the U.S. Energy Information Administration estimates could be pumped out of the Arctic Refuge before 2020. If replacement tires improved fuel economy by four percent--an achievable goal considering the range of efficiencies in today's replacement tire market and the fact that tire companies are just starting to innovate in this market--then the tire industry would help cut U.S. global warming pollution by over 42 million metric tons and save drivers over $9.2 billion in gasoline at the pump. Fuel efficient tires are good for consumers, good for the environment and good for national security.