



ALTERNATE FUEL TECHNOLOGY

Reduce the Use— It's Everyone's Business



Editor's note: In this article author Bob Rodriguez reviews the reasons and means for using less petroleum. Some recent industry solutions are also discussed, and consumer tips are presented.

In recent months we've seen some real upheavals in the supply of domestic gasoline and diesel fuel to the marketplace. These disruptions have caused price spikes at the pump, and experts tell us relatively higher gas prices are here to stay. As technicians and shop owners, you know how to get maximum mileage out of your vehicles, and how to help your customers do the same. You may want to be able to explain why prices have fluctuated as well. In this article, we'll review some market basics, then examine a few recent industry approaches to solving this on-going challenge, and summarize a few consumer-friendly tips.

High Fuel Prices

Some don't understand why gas prices have been going up. It's basic supply and demand. The U.S. consumes about 25 percent of the world's oil supply, but we're only about three percent of the world's population; other countries want oil too. Since we import about 65 percent of our petroleum from outside the U.S., much of it from the Middle



Author Bob Rodriguez seen driving a demonstration three-cylinder turbo-diesel Smart Car which reportedly gets around 80 MPG.

East, and because emerging economies such as India and China are using increasing amounts of fuel, there's greater competition. Making matters worse: stagnant refining capacity stateside and domestic supply disruptions due to natural catastrophes.

Oil shortages in the US are not new. During World War II gasoline was rationed, and during the '70s Oil Embargo, customers waited in lines to gas-up on allotted days. Congress enacted the Energy Policy Act in 1992 ("Epack 92") as an incentive to scale back our use of petroleum. Fleets were encouraged to use "alternatives" like natural gas, propane, ethanol and methanol instead of petroleum-based gasoline or diesel fuel, but EPACK fell short of intentions.¹ While Congress attempted to reduce fuel consumption by raising CAFE standards (and the industry responded with cars

that got better mileage), gains were offset by motorists driving ever more miles and their love affair with larger, heavier vehicles.

Congress is again considering raising CAFE vehicle standards, and some states have passed laws to blend alternatives like ethanol and biodiesel with petroleum based fuels. Truck and bus

idle-reduction laws are also being passed to reduce the use and cut down on air and noise pollution. At the other end of the supply chain, consumers are responding enthusiastically to OEM's hybrid offerings and are showing a renewed interest in smaller (less thirsty) conventional vehicles.

The Industry Responds

On-board technology is helping many newer vehicles deliver improved performance and fuel economy, and reduced emissions. The nation's package delivery fleets are testing medium-duty hybrid-electric vehicles; and refuse haulers are testing heavy-duty hybrid-hydraulic vehicles to speed up start-stop route times and save on fuel.² Both types use regenerative braking to store kinetic energy of braking to help launch the vehicle.

Vehicles with automatic cylinder deactivation (sometimes called DOD or "displacement-on-demand" systems) help save fuel.

Six-speed automatic transmissions now available on Corvette and Cadillac models help improve acceleration, and according to GM "...can enhance fuel economy by 4 percent." Expect to see wider use of both these and ECVTs (electronically controlled continuously variable transmissions) in the future.

Off-board, software like the United Parcel Service's "package flow" system with specialized handheld hardware is helping map out shorter and more efficient routes for drivers and "significantly" reduce miles driven. According to UPS, once it's completely implemented "package flow technologies will reduce the mileage of package cars by more than 100 million miles each year and is expected to save UPS 14 million gallons of fuel annually. The environment becomes the real winner as this fuel savings translates into an annual reduction of 130,000 metric tons of CO2 emissions."³

When resting at truck stops so equipped, truckers can use "shore power" systems for cab HVAC and reefer power, thus enabling engine shutdown for fuel savings, lower emissions and less noise.

When loading, unloading, or just keeping warm, trucks or buses standing idle for extended periods can be shut down and use auxiliary power units (APU) to reduce engine hours and save fuel. According to the EPA, "long-haul truck idling

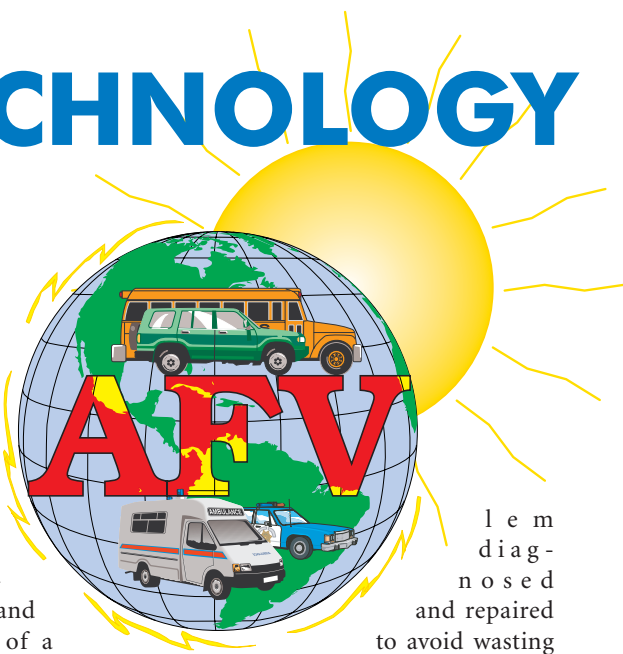
alone consumes approximately 960 million gallons of diesel fuel each year." By using an APU instead of idling a truck's engine overnight for heating and air conditioning of a sleeper cab, the operator can reduce fuel consumption by 80-90 percent.⁴ The use of small diesel-engine or fuel-cell APUs not only reduces costly engine idling, but also helps clear the air. According to calculations by the U.S. Department of Energy "...a power unit with fuel cell technology could reduce the emissions of carbon dioxide from a single truck by between 20 to 30 tons annually. In the same manner, the emission of nitrogen oxides could also be reduced significantly."⁵

Customer Education

With high gasoline prices, routine maintenance and service should be easier to sell. The customer will see longer vehicle life and optimal mpg; the environment is helped through less emissions; the nation becomes a bit less dependent on imported oil; and you help your business. In short, everyone benefits.

The basics of getting good fuel economy are familiar, but bear repeating to your customers:

- 1 All vehicle operators can save fuel and energy by simply practicing sensible driving habits. Aggressive driving is hard on vehicles and other motorists, and cuts deeply into fuel economy.
- 2 Remind your customer if his or her vehicle starts performing poorly, it's important to take immediate steps to have the prob-



lem diagnosed and repaired to avoid wasting fuel—to say nothing of catching minor problems before they become more costly.

3 Routine maintenance performed on any vehicle will also help save fuel. For example, low tire pressures seriously affect fuel consumption; Besides reducing tire wear, Ford Motor Co. says "...keeping pressures up to spec can reduce the average amount of fuel you use by 3-4 per cent." Keeping wheels in alignment minimizes wear and a loss of economy from added rolling resistance.

4 For larger vehicles, using wider "single-wide" tires instead of "duals" helps reduce rolling resistance and weight for better economy. According to the EPA's SmartWay program, using a combination of aluminum wheels and single-wide tires can shave 250 pounds (or more) per axle off of overall vehicle weight.⁶ Improved vehicle aerodynamics with spoilers, fairings and (pickup truck) tonneau covers is another easy way reduce fuel consumption.

Share this information with others; they'll also appreciate ideas on how to "reduce the use."



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Some states have anti-idling laws. An on-board auxiliary power unit (APU) like this can save 80 percent on rest-stop fuel expenses, reduce engine hours, maintenance costs, and driver fatigue. Cabin HVAC, battery charging and engine warming can be powered by the APU when the truck engine is shut down.

Footnotes

- 1 See previous ASE Tech News articles for background information; contact the author.
- 2 See http://www.fedex.com/us/investorrelations/financialinfo/2005annualreport/online/hybrid_trucks.html.
- 3 For more information go to <http://www.pressroom.ups.com/mediakits/factsheet/0,2305,1134,00.html> or contact UPS Public Relations at 404-828-7123.
- 4 For information on APUs, truck-stop electrification, HVAC, and other services for drivers, go to www.epa.doe.gov/smartway/idling.htm.
- 5 Quoted at http://www.autoindustry.co.uk/news/industry_news/22-06-05_11.
- 6 See SmartWay E-Update, Volume 2 Issue 2, Spring 2005. The SmartWay program offers incentives and recognition for fuel reduction. Visit EPA's SmartWay program website at www.epa.gov/smartway.

Part of a continuing series on alternate fuel vehicles and advanced vehicle technology. If you have comments or questions, contact ASE's Bob Rodriguez at 703-669-6634 or brodriguez@asecert.org.