

Overdrive

Future Fuels

Paul Hartley, Dec. 3, 1999

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It would be timely, here at the start of the 21st century, to announce that by 2030 or 2050, trucks will be propelled with a magical new fuel, something akin to radon or kryptonite or sodium bicarbonate. Although plenty of studies have been done with various alternatives - ethanol, methanol, methane, propane, electricity and fuel cells - none has yet demonstrated as much economy or overall efficiency as good old No. 2 diesel, which is expected to power the trucking industry far into the future.

Of course, tomorrow's diesel fuel will be vastly different from today's, with almost no sulfur or aromatics, and probably higher cetane ratings. All of the changes will result from ever-stricter EPA regulations that'll continue to cut exhaust emission levels until trucks leave only the faint scent of lilac blossoms in their wake.

The efforts to find alternative fuels have always been based on two main objectives: improve air quality - particularly in metropolitan areas - and trim the country's dependence on non-renewable petroleum supplies, most of which are located beneath foreign soil. Alternative fuels achieve these dual goals, but all have one or more drawbacks: either higher cost, lower power, limited operating range or insufficient distribution channels. Even hydrogen-based fuel cells, the subject of many hopeful articles in recent years, present enough obstacles to keep them from launching heavy-duty trucks for a long while.

Given this assortment of alternative complications, engine builders and most of the trucking industry have set their collective sights on diesel as the next century's primary fuel. Government regulators have apparently done the same, proposing that sulfur levels be reduced from a maximum of 500 ppm to 50 ppm within the next seven years. Sulfur has been targeted once before, in October 1993, when it was reduced from 5,000 ppm (or .5 percent by weight).

A natural component of petroleum, sulfur adds nothing to the combustion process, but plenty to the exhaust-particulate count. It also tends to plug up after-treatment devices, such as catalytic converters, which engine OEMs will begin using during the next decade to comply with tougher nitrogen oxide (NO_x) rules.

Oil companies have a couple of choices for meeting, or exceeding, the next round of sulfur reductions. They can further refine the current product, or start building facilities capable of making synthetic diesel fuel from natural gas, a process called Fischer-Tropsch that's been around since the 1920s. Many experts predict a two-step approach, with purer oil-based fuels coming sooner and synthetics later. Both will be more costly than that found at the pumps now.

Refiners could also consider one other environmentally friendly alternative: biodiesel, commonly a mixture of standard fuel (80 percent) and plant oils (20 percent). Biodiesel offers high power, good fuel economy and fewer emissions. It also boosts fuel lubricity - important in low-sulfur fuels because they contain less paraffin, a lubricating agent. Like the other "alts," though, biodiesel's success has been hampered by comparably higher prices and minimal distribution.

It is possible to make cheaper biodiesel from spent cooking oil. A handful of Web sites and at least one book (*From The Fryer To The Fuel Tank*) describe the process, its benefits and pitfalls. This might be a good way to get rid of Fry Daddy remnants, but it probably wouldn't satisfy the fueling needs of many truckers, especially those who've switched to a low-fat diet for their New Year's resolution.