

A Petroleum Alternative, But U.S. Says It's Illegal

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Modifying a car or truck to run on vegetable oil is illegal, but violators are unlikely to end up on the F.B.I.'s most wanted list. As an environmental strategy, the value is unmeasured.

The problem is that laws governing the Environmental Protection Agency require that motor vehicles be certified before they are sold, and no one has ever even tried to certify a car or truck running on vegetable oil. To the E.P.A., fuels and vehicles are guilty until proved innocent.

But the E.P.A. says it has never fined anyone, and some state officials, who also enforce clean-air regulations, said they not recall any enforcement actions.

"I strongly doubt they would ever throw the book at anybody," said S. William Becker, executive director of the State and Territorial Air Pollution Control Administrators. "If they ever caught up with someone doing this, they probably would read them the law and regulations and say, 'Go away.'"

But that is not to say vegetable oil is harmless. Margo T. Oge, director of the E.P.A.'s Office of Mobile Sources, said that vegetable oil was denser than the diesel fuel designed for cars and trucks and that it had a lower cetane rating, a measure of how well a fuel burns; lower numbers do not burn as well. Those are two factors that her engineers suspect would make the vehicle produce more soot particles.

"We have rules in place, as required by Congress, that have to do with making sure that when vehicles are designed to run on a certain fuel, they do so," she said. "If the fuel changes, you go to something less well characterized." Specifically, she said, when sprayed into a cylinder, the fuel forms a different pattern and burns differently.

Ms. Oge said the proper approach would be to put the vegetable oil through a chemical process called esterification, which manufacturers use to turn soy oil into biodiesel, a vegetable-based fuel that is certified as a diesel supplement. The raw material for biodiesel is usually soybean oil, but rapeseed oil or animal fats can also be used.

The process removes one component, glycerine, which can be sold for use in soap or other products. The biodiesel is usually burned in a mixture that is 80 or 90

percent ordinary petroleum diesel, since straight biodiesel does not perform well in cold weather.

Using biodiesel, like other renewable fuels native is to pump crude oil from deep under-ground, but burning the crude releases carbon dioxide into the atmosphere. In contrast, if a vehicle is fueled with biodiesel, the carbon in the crude oil stays underground. And while burning biodiesel does create carbon dioxide, harvesting the soybeans or other raw materials leaves space for new soybeans to grow, and as they grow, they absorb carbon dioxide from the atmosphere.

Some independent researchers share Ms. Oge's view. C. R. Krishna, a research scientist at the Brookhaven National Laboratory, operated by the Energy Department on Long Island, said vegetable oil could make pollution worse. Dr. Krishna said burning the oil might increase production of nitrogen oxides, which lead to smog. He said he based his opinion on the performance of biodiesel.

"The jury is out on that one. Vegetable oil can be better or if can be worse. I imagine that it would be worse."

There are other problems. The Engine Manufacturers Association does not recommend using vegetable oil or animal fats in diesel engines. Such fuels can create deposits that make piston rings sticky, and can create impurities in the fuel injection system that will interfere with proper engine operation, the group said.

Others contend that drivers will not have problems if they follow the rules by delaying the switch from diesel to vegetable oil until the proper temperatures are attained.

Asked if he would use vegetable oil in his car, Dr. Krishna said, "Not unless it's on its last legs."

"I'm sure there are people who are doing it and they're very happy," he said, especially because some drivers get the fuel free from restaurants. "But it's not a standard fuel coming out of a pump," he said. "Somebody's experience can be happy, and somebody else, not so happy." Researchers agree that using vegetable oil has two positive effects. One is to reduce the carbon in the atmosphere, compared with making fuel from crude oil. The other is to reduce oil imports and the pressure on oil prices, although at the volumes now available both effects are quite small.

Cooking oil isn't certified so it is presumed guilty until proved innocent.