

Experts Seek Ideal Low-Carbon Fuel, But Expect Diesel to Remain Dominant

SAN DIEGO — Engineers and government regulators described their ideals for fuels of the future but were unable to say with precision what the freight transportation industry would be using to replace traditional diesel or when that would happen.

At meetings here on clean heavy-duty vehicles, conference partici-

pants said the low-carbon-dioxide goal they seek is something other than Middle Eastern oil, is not based on corn or soybeans and provides more energy than it consumes in production and processing.

"CO₂-free transportation is conceivable, by using fuels from renewable resources that are carbon-neutral," said Tony Greszler, vice

president of engineering for Volvo Powertrain. He listed as possible sources for alternative fuels: rapeseed, soy, wheat, sugar beets, wood and even animal waste.

As to timing, though, Greszler said at the conference, "Petroleum diesel may remain dominant for two more decades."

Fuel based on grain and other

crops used for food drew criticism because, it was argued, the extra demand for the crops raises the price for them. Higher prices lead to more deforestation, so wilderness gets turned into agricultural land. Clearing forest is undesirable because dense groves of trees help consume carbon dioxide and turn it back into oxygen.

"In terms of fuel, we should get out of the food chain, but this is what we have for now," said Henrik Erametsa, vice president of U.S. operations for Finland-based Neste Oil. He said wood and

algae have some possibilities for supplying fuel.

"We don't want to cause unintended consequences for land use around the planet because of fuel feed stocks," said Mary Nichols, chairwoman of the California Air Resources Board.

In judging the attributes of a fuel, there was a consensus for life-cycle analysis that considers what happens "from well to wheel," or from extraction through production and preparation, and then to final use.

In discussing the carbon density of fuel, Tony Picarello, a vice president of Westport Innovations, said comparing methane with diesel is an example. Each methane molecule has the formula CH₄, or one part carbon and four parts hydrogen. In contrast, diesel is made of lengthy carbon chains.

"Liquefied natural gas has 25% less carbon per unit of energy than diesel," he said. Westport has a joint venture with Cummins Inc. to make engines that run on LNG.

Volvo's Greszler said his company has identified seven substances with which it could work, but he finds di-methyl ether, a gas that can be liquefied, to be quite promising. He described its chemical structure as two methane-like groups, CH₃, linked by a single oxygen atom.

— Jonathan S. Reiskin

Between 1 and 10.

