



# Growing Cleaner Fuels

An Interview with Mike Livergood, Vice President, Global Oleo Chemicals, Archer Daniels Midland Company (ADM), Decatur, Illinois



Mike Livergood

**EDITORS' NOTE** Mike Livergood joined ADM in 1975 and has held various management positions within the oilseed processing division, as well as merchandising positions throughout the company. He was named vice president, global oleo chemicals in 2005, and previously served as vice president, North American oilseed processing, with responsibility for sunflower seed and flaxseed crushing.

**COMPANY BRIEF** Headquartered in Decatur, Illinois, Archer Daniels Midland Company (ADM) is a world leader in agricultural processing. ADM ([www.admworld.com](http://www.admworld.com)) is one of the world's largest processors of soybeans, corn, wheat, and cocoa, and a leader in the production of soy meal and oil, ethanol, corn sweeteners, and flour. In addition, ADM produces value-added food and feed ingredients. With over 25,000 employees and more than 250 processing plants, the company reported net sales of \$35.9 billion for the fiscal year ended June 30, 2005.

## What has been ADM's work with Volkswagen?

ADM and Volkswagen are working together through a joint research agreement to further develop and utilize biodiesel fuels for the automotive industry. ADM is providing technical support to assist trade and regulatory organizations

with establishing a universal quality standard for biodiesel that will ensure consistent performance in automobiles.

## How is ADM involved in the biofuels industry now?

ADM is committed to helping meet the energy needs of the world through the use of renewable fuels. In terms of biodiesel, we have the world's largest biodiesel plant in Hamburg, Germany, another facility in Leer, and one planned for Mainz. ADM is also entering the U.S. biodiesel market with plans for a fully owned plant in Velva, North Dakota, and a plant in Mexico, Missouri, through a joint venture with Mid-America Biofuels, LLC. We also formed a joint venture with the Wilmar Group for a Singapore biodiesel plant.

ADM is also involved with ethanol in the U.S. Right now, we have ethanol plants in Decatur and Peoria, Illinois; Cedar Rapids and Clinton, Iowa; Columbus, Nebraska; Marshall, Minnesota; and Walthalla, North Dakota. We also are expanding our U.S. ethanol capacity by 500 million gallons through the addition of new dry-milling facilities adjacent to current ethanol plants.

## What are some of the benefits of biofuels over petroleum-based fuels?

Using biofuels to meet the world's growing energy needs is good for our environment and our economy. While both fossil-fuel- and biofuel-powered engines produce CO<sub>2</sub> emissions, only biofuels come from plants, which remove CO<sub>2</sub> from the air. As a result, a U.S. government study found that biodiesel reduces net carbon dioxide emissions by 78 percent compared to petroleum diesel. Similarly in 2003, the reduction of CO<sub>2</sub>-equivalent greenhouse gas emissions through the use of ethanol was equal to removing the annual emissions of nearly one million cars from the road.

Plus, increased adoption of biofuels will drive economic growth and job creation and will reduce reliance on foreign oil. Biofuels also provide a vital value-added market for corn and oilseeds, giving an economic boost to rural America. ADM is proud to partner with farmers in this effort, like we did with Mid-America Biofuels,

a farmer co-op, to bring a biodiesel plant to Mexico, Missouri.

## What crops are used to produce biofuels?

In the U.S., biodiesel is usually produced from vegetable oils, like soybean or canola, and ethanol is usually produced from the starch in corn. Worldwide, palm oil is also used to produce biodiesel, and sugar is used to produce ethanol.

## Will there be enough crops to meet the demands for both food and fuel uses?

Biofuels are part of the solution to the question of tomorrow's energy demands; however, they are not meant to replace fossil fuels completely. Currently, there is an adequate supply of crops to meet both the needs for food and fuel.

In the future, cellulose may also be used to produce ethanol. Cellulose is the most common organic compound on Earth, and it's the main component of plant cell walls. Cellulose is not currently used to produce ethanol, since it is more difficult to process into sugars for ethanol production. However, if the technology to convert cellulose into ethanol proves feasible, then the availability of new crops – like switchgrass – that can be used to produce ethanol will open up. Additionally, cellulose provides yet another opportunity to expand the number of materials that can be used to produce ethanol. Materials that now are seen as wastes, like corn stalks and wood chips, could also be available for ethanol production.

## What are some other industrial products that can be made from agricultural sources rather than traditional petroleum?

ADM continues to look for ways to use agricultural-based products to meet global demands. As the world's demand for petroleum increases, agricultural-based resources become increasingly competitive and desirable in the marketplace. Recently, ADM announced plans to build a polyols facility that will use agricultural-based feed stocks to produce propylene glycol and ethylene glycol – chemicals that are traditionally made from petroleum-based feed stocks. ●



# Using Cleaner Fuel

**An Interview with Matthias Rabe, Executive Director,  
Group Research, Volkswagen AG, Wolfsburg, Germany**



Matthias Rabe

**EDITORS' NOTE** After studying mechanical and aviation engineering at RWTH Aachen University in Germany, Matthias Rabe began his career at Volkswagen as a trainee. He proceeded to serve in a number of positions within the company, including manager of chassis and electronic development in Shanghai; manager of group development, Asia; and head of car safety development. He was appointed to his current position in May 2003.

**COMPANY BRIEF** With its base in Wolfsburg, Germany, Volkswagen AG is Europe's largest automaker, manufacturing the VW line (which includes the Golf, Jetta, New Beetle, Passat, Phaeton, and Touareg), as well as Audi, Bentley, Lamborghini, Seat, and Skoda, at plants in Europe, Africa, the Americas, and Asia Pacific. It also owns 34 percent of Scania (a Swedish truck maker), has a successful financial services subsidiary, and owns Europcar International (car rentals). In 2004 the corporation reported total sales of \$121.3 billion and net income of \$923.4 million.

**How is the world's energy problem being eased by the joint venture between Volkswagen and Archer Daniels Midland [ADM]?**

People are rightly worried about the

increase in greenhouse-gas emissions, and are talking more and more about the security of energy supplies. We believe it's important to take a broad approach to these problems and look at more than just fuel. Accordingly we have developed a fuel and powertrain strategy. Developing new technologies and fuels together gives us the opportunity to improve the combustion process and therefore the efficiency and emission levels of engines. We are also looking into alternative energy sources for fuel production. We work together with competent partners both on the engine technology and the fuel production side to achieve the ambitious goals. ADM is an important player for us in that way. As a producer of soybeans ADM is in an excellent position to produce a soybean-based biofuel.

**Will these developments lead to the elimination of gasoline use?**

No, but we think we will be able to make a biomass-based fuel that could be a major substitute for fossil-based fuels. The first step is the fuel based on soybeans, what we call the biofuel of the first generation. Longer term, we will see the development of synthetic fuels, the first of which will be the so-called gas-to-liquid fuels. We are working with some mineral oil groups on a project to convert natural gas to liquid fuel. This synthetic fuel will be the next additional step after biofuel. It will still be fossil-based, but it will not be made of crude oil but of gas, which is more available. The third step will be when synthetic fuel is made out of biomass, which we call SunFuel, the biofuel of the second generation. We estimate that as much as 25 percent of the fuel used in Europe could be biomass-based by 2020, and 50 percent of the diesel demand for cars in Europe could be biomass-based by that time.

**Will this be a very expensive transition? Will cars have to be completely re-engineered to run on these fuels?**

It is possible to run today's cars on the new fuels, and we have already done this. We carried out major tests in Europe

with a version of this synthetic fuel and we obtained much better exhaust emission qualities than with conventional diesel using existing cars, without changing any parts. That means we will be able to operate today's fleet with that new fuel. In addition, this new fuel offers us the opportunity to improve the combustion process so that we get a higher performance from the engine.

**Will airplanes be able to fly on synthetic fuel as well?**

In principle, yes. It would just be a matter of volume, and whether or not it would make sense from a practical point of view. We are concentrating on car engines at present. But recently representatives from the aviation industry contacted us to discuss common projects in the field of synthetic fuels.

**Most people think that biofuels are cleaner than oil-based fuels. Is that right?**

That differs. Pure vegetable oil, for example, is sometimes used as fuel and leads to much worse exhaust emissions than the use of conventional diesel fuel. But carefully produced biofuels, especially synthetic biofuels like SunFuel, are definitely cleaner. Theoretically, you could drink the biomass-based synthetic fuel, but maybe you shouldn't try it.

**What else can you make clean synthetic fuel out of?**

There are many opportunities. You could make fuel out of animal waste, for example – the material that meat factories cannot sell. And wood, of course. A lot of wood is wasted in the furniture industry, and that could be put to good use as energy.

**What about garbage? Many countries are facing a huge problem disposing of their everyday waste. Can you use garbage as fuel?**

You cannot use metal, but you can use lots of other types of garbage and all kinds of hydrocarbon material. It would be quite hard to organize logistically, and you might not get the quantity of useful material you needed to make it worthwhile, but in principle, garbage could be turned into fuel. ●