Ethanol use debated while millions starve

by Suzanne Rose

While the great African drought and famine and harvest shortfalls in Russia and eastern Europe confront us, the big agricultural debate in the United States this election year is whether President Bush will press for expanded use of ethanol to boost agriculture markets. The alternative, critics say, is a collapse in corn prices and a sellout to big oil and environmentalist interests. The reality is that the control over the corn markets by the big corn processors, who are also the big producers of ethanol, has been the cause of the collapsing farmer prices for corn. Use of corn for fuel is a waste of energy and money.

Ethanol is a fuel made from the byproducts of vegetation biomass, such as corn. Its use has expanded a hundredfold since the Carter administration, when it was introduced under the guise of making the United States less dependent on imported fuels. It has become a boondoggle for the agribusiness cartels such as Archer Daniels Midland (ADM) and Cargill. Today, 350 billion bushels of corn are processed annually in Iowa and Illinois, in plants built with government subsidies and tax breaks. The goal is to triple the corn processed for this purpose.

In April, the Environmental Protection Agency announced that it would not include ethanol on its list of fuels which can be used to reduce pollution levels to comply with the Clean Air Act. The EPA argument was not that corn is too precious for food and feed purposes to be burned as a fuel, but that ethanol use can contribute to ozone depletion when warm weather causes the alcohol to evaporate. ADM, the biggest producer of ethanol, immediately announced that it was scrapping plans to increase its ethanol-producing facilities in Iowa. Farmers, desperate for markets, are falling for this definition of the controversy—it's us little farmers against the big, powerful oil interests.

Ethanol makes use of energy stored in plants through photosynthesis in the form of sugar or starch. Its two main sources are corn and sugarbeets. The sugar is fermented into ethanol and carbon dioxide by means of yeast. The carbohydrates are split off through hydrolysis, before they can be fermented into ethanol. This creates a 6-12% ethanol solution which is processed to a higher percentage through distillation. This process entails a considerable expenditure of energy. Through a repeated distillation, the so-called pure alcohol is produced with an alcohol content of 90%.

The caloric value of ethanol amounts to 5.88 kilowatts per hour. A comparison with the heating power of other fuels is: straw (air dried), 4.31; wood, 5.23; coal, 9.24; and heating oil, 10. Ethanol thus possesses a caloric content similar to straw or air-dried wood.

Wasting energy

But the energy costs of the production process must also be considered. Included must be the energy required for the cultivation, harvest, transport, and processing of the plants. Pilot projects in Europe showed that the net change in energy was negative. More energy must be employed in the production of the ethanol than is available for use in the end product. The energy content of the processed foodstuffs vastly exceeds the energy content of the ethanol produced. The product exhibits an energy density which is relatively trifling, compared with that possessed by the raw material out of which it was originally produced.

The degree of refinement—the quotient of the energy content of the processed foodstuffs to the energy usage of the production process—is: sugar beets, 5.0; potatoes, 3.17; corn, 5.36; grain, 3.6. The prospective products at harvest have stored the totality of the energy that must be expended through fertilization, watering, and the employment of machinery. When ethanol is further processed from these materials, the figures are: sugarbeets, 0.56; potatoes, 0.51; corn, 0.37; grain, 2.1. The degree of refinement is only positive for grain, and negative for all other products. Thus, more energy is used, in order to transform potatoes, corn, and sugarbeets into alcohol, than the resulting alcohol is able to deliver. When you include the caloric value used up during the production process, the proportion becomes absurd.

In order to calculate the real costs of ethanol, the processing schedule of the raw materials is decisive. Agricultural goods can only be harvested at specific times, and then can only be stored for a short time, so that the processing period is limited to 90-250 days. This raises the investment costs considerably, because for the rest of the year the installation lies idle. The fixed costs, such as installation, building, upkeep, and insurance, amount to about 50% of total costs. After that comes the 10% which makes up personnel, energy, and other costs. A study produced by the German government research ministry, "Fermented Alcohol from Agricultural Products as Bio-Fuel," shows that ethanol is four times as expensive to refine as gasoline.

German government studies showed that ethanol is not competitive with gasoline. For a fuel content of 5% ethanol, because ethanol has less energy content than gasoline, 12.5 liters of gasoline-ethanol mixture would be needed per 100 kilometers, as opposed to 8 liters of gasoline for every 100 kilometers. Studies made by Volkswagen indicate as well, with higher condensation and lower speeds, an increase in usage of 25%.