RENEWABLE FUELS ASSOCIATION

WATER AND ETHANOL DO MIX
GAO REPORT: "ENERGY-WATER NEXUS" LEAVES OUT IMPORTANT WATER STATISTICS

A recent report from the Government Accountability Office (GAO) offers little new insight into the issue of water and biofuels. Rather, it recycles many of the claims that have already been refuted. The vast majority of corn (~96%) used for ethanol production is rain-fed, requiring no irrigation. And, while ethanol production has increased, the number of acres under irrigation has remained largely unchanged.

Ethanol production is rapidly reducing its water needs, with biorefineries today already reducing water need to produce ethanol and distillers grains to less than 3 gallons of water per gallon of ethanol. In addition, they are developing technologies to use pre-treated or "gray water" that has already been used for another industrial purpose. Since 2001, water use at ethanol biorefineries is down 26%.

Ethanol plants also comply with all federal, state and local regulations regarding the discharge of water. In many cases, the water released from an ethanol facility is safer than when it was originally drawn. Moreover, many facilities are greatly reducing discharge rates as they improve recycling and other water efficiency technologies.

The issue of water cannot be discussed in a vacuum, as the GAO report does. Other energy industries, including oil and gasoline production and even solar power, require large amounts of water that in many cases dwarf the needs of ethanol. With this in mind, the following are key points about water use and America's ethanol industry that were overlooked in the GAO report.

- The GAO report cites a study by Argonne National Laboratory that suggests 10 to 17 gallons of water are needed to manufacture one gallon of corn ethanol in the states where most ethanol is produced. However, a strong case can be made that irrigation water use for crops should be considered separately from the actual water use required for feedstock conversion at the ethanol biorefinery. This is because history has shown that 10-15% of the corn crop will be irrigated using ground and surface water ***with or without*** increasing ethanol production levels (see example below).

- According to the recent USDA Census of Agriculture, about 13% of the corn crop was irrigated in 2008 when ethanol production was more than 9 billion gallons. A similar proportion (12%) of the U.S. corn crop was irrigated 10 years ago in 1998 when the U.S. ethanol industry produced just 1.4 billion gallons and used less than 4% of the nation's corn. Thus, it is disingenuous to allocate ground or surface water used for corn irrigation to ethanol simply by prorating irrigation use for the proportion of the corn crop used for ethanol across the total gallons of ethanol produced. Even if ethanol demand didn't exist, similar amounts of irrigated corn (or, at least, other irrigated crops) would likely be grown to satisfy other market demands.

- Critics tend to focus only on the *amount* of corn acres that are irrigated and not on the improving *application rate* of irrigation water per acre. What is important in considering the irrigation requirements for corn is the total amount of ground ad surface water required. For example, irrigated corn acres grew slightly from 2003 to 2008, but because of a 17% reduction in the amount of irrigation water applied per acre (USDA), total irrigation water use was unchanged.
- Even though the practice of attributing irrigation water use to ethanol by prorating is questionable, the overwhelming majority of ethanol is produced from corn that is rain-fed and requires no irrigation from surface or ground water. In fact, according to a scientific article published by the National Renewable Energy Laboratory, "96% of corn used for ethanol production is not irrigated."

- GAO correctly recognizes that producing one gallon of ethanol today requires 3 gallons of water at the biorefinery (a 3:1 ratio). Further, the report acknowledges that this ratio continues to decrease as new technologies are developed and adopted. GASO says, "Technological improvements have already increased water use efficiency in the ethanol conversion process. Newly built biorefineries with improved processes have reduced water use dramatically over the past 10 years, and some plants have reduced their wastewater discharge to zero."

- Unfortunately, GAO does not put ethanol's water profile in proper context. The report fails to adequately compare ethanol's water profile to the water use requirements for other energy sources. Specifically, ethanol's water use ratio (3:1) should be compared to the water requirements of the petroleum fuels that are being replaced at the margin of the fuel market. For instance, according to researchers at the University of Alberta, the production of one barrel of oil from tar sands requires up to seven barrels of freshwater (7:1). Some estimates are even higher. According to the Pembina Institute, "For oil sands mining, approximately 12 barrels of water are needed to produce each barrel of bitumen in surface mined oil sands operations [12:1]."

- The GAO report correctly points out that ethanol project developers must obtain water use permits before building facilities. If local permitting authorities find that the presence of an ethanol facility – one that uses about as much water as a typical golf course annually – would jeopardize local water supplies, they rightly deny the permit. Simply put, ethanol plants are not being built in areas where water resources are questionable.

- The GAO report suggests that, "Increased corn production will also increase the use of pesticides—including insecticides and herbicides—which also have the potential to affect surface water and groundwater quality." This statement is questionable at best, as pesticide use has fallen dramatically with the widespread adoption of biotech corn hybrids that contain traits designed to provide natural resistance to common pests. The Department of Energy review letter in the appendices highlights the fallacy of the GAO assertion on pesticides by stating, "…statements regarding the likely need for additional nutrients and pesticide inputs on marginal lands…are speculative. It could be noted that alternative views exist…"