

*The Economist*

Ethanol and water

# Don't mix

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## New reasons to be suspicious of ethanol

OFFICIALS in Tampa, Florida, got a surprise recently when a local firm building the state's first ethanol-production factory put in a request for 400,000 gallons (1.5m litres) a day of city water. The request by US Enviropower would make the facility one of the city's top ten water consumers overnight, and the company plans to double its size. Florida is suffering from a prolonged drought. Rivers and lakes are at record lows and residents wonder where the extra water will come from.

They are not alone. A backlash against the federally financed biofuels boom is growing around the country, and "water could be the Achilles heel" of ethanol, said a report by the Minneapolis-based Institute for Agriculture and Trade Policy.

The number of ethanol factories has almost tripled in the past eight years from 50 to about 140. A further 60 or so are under construction. In 2007 President George Bush signed legislation requiring a fivefold increase in biofuels production, to 36 billion gallons by 2022.

This is controversial for several reasons. There are doubts about how green ethanol really is (some say the production process uses almost as much energy as it produces). Some argue that using farmland for ethanol pushes up food prices internationally (world wheat prices rose 25% this week alone, perhaps as a side-effect of America's ethanol programme). But one of the least-known but biggest worries is ethanol's extravagant use of water.

A typical ethanol factory producing 50m gallons of biofuels a year needs about 500 gallons of water a minute. Most of that goes into the boiling and cooling process, which is similar to making beer. Some water is lost through evaporation in the cooling tower and in waste discharge. All this is putting a heavy burden on aquifers in some corn-growing areas.

Residents went to court in Missouri to halt a \$165m facility being built by Gulfstream Bioflex Energy LLC which was projected to draw 1.3m gallons of water every day from the Ozark aquifer. Projects are being challenged in Minnesota, Iowa, Nebraska, Kansas and in central Illinois, where eight ethanol facilities are situated over the Mahomet aquifer. Demand for corn is such that more land is also being ploughed up in drier regions of the Great Plains states to the west of the corn belt, where irrigation is required, increasing water demand further.

The good news is that ethanol plants are becoming more efficient. They now use about half as much water per gallon of ethanol as they did a decade ago. New technology might be able to halve the amount of water again, says Mike Fatigati, vice president of Delta-T Corp, a Virginia company which has designed a system that does not discharge any waste water. But others are sceptical. "There are things you can close loop [ie, recycle efficiently] and things you can't," says Paul Greene, a senior director for biofuels with Siemens Water Technologies, designers of the water-purification technology used in ethanol factories. Perhaps ethanol just isn't as bio-friendly as it looks.