

April 2003

# Louisiana Energy Topic

Department of Natural Resources

Technology Assessment Division

A Supplement to LOUISIANA ENERGY FACTS on Subjects of Special Interest

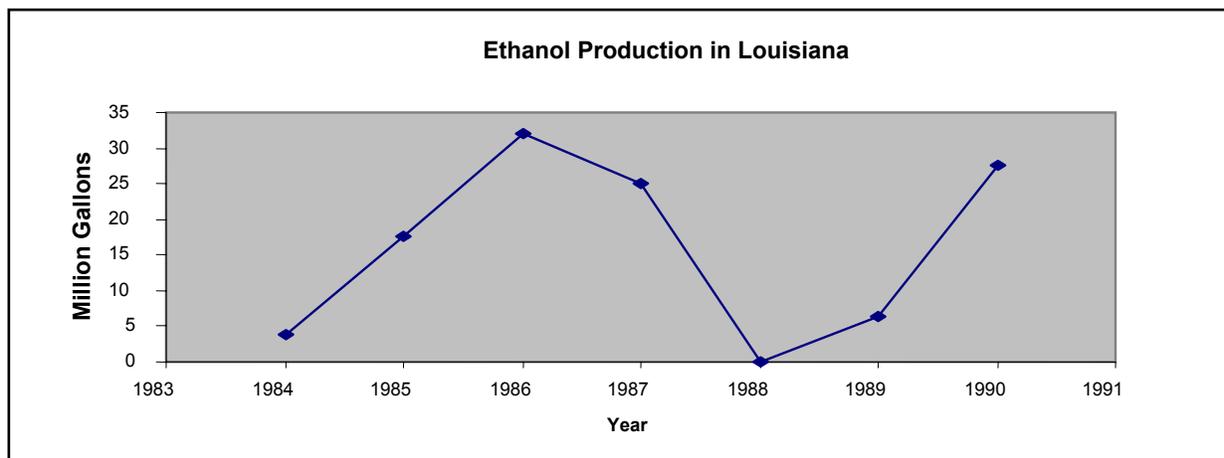
## Ethanol Industry Update

At the state level, ethanol production has been dormant since 1990, but should soon be producing again. BC International's ethanol plant conversion in Jennings appears to be back on track after struggling to obtain financing for the project. State Agricultural Commissioner Bob Odom's plans for an ethanol plant in Lacassine have been shelved due to high cost estimates for construction, but local officials are still working to make it a reality.

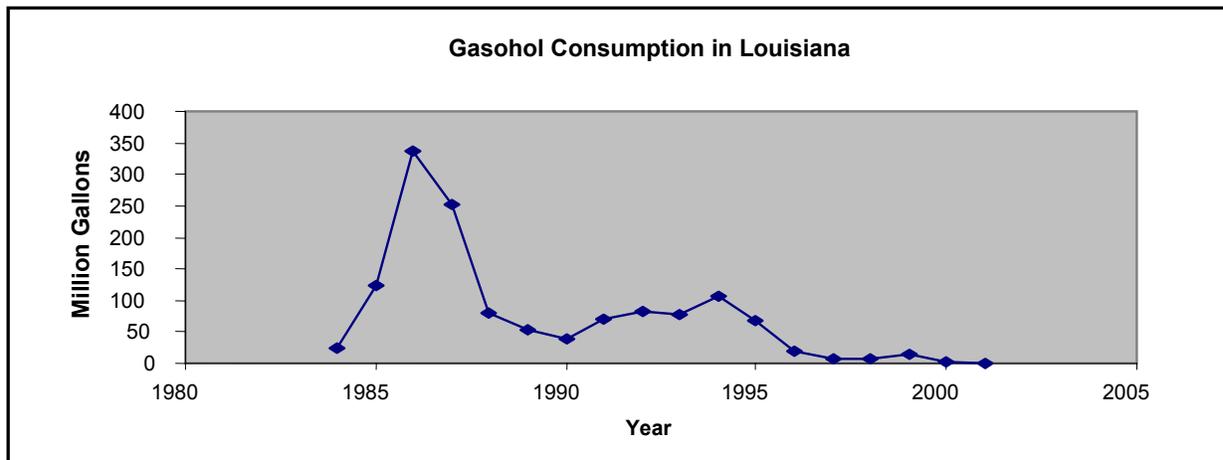
On the national level, the ethanol industry has received much attention lately. Much of the attention results from proposed federal energy legislation and states phasing out methyl tertiary-butyl ether (MTBE), which is widely used as an oxygenate and octane additive in gasoline. A federal energy bill is currently being debated in congress. One of the main goals is to heighten national energy security by reducing our dependence on foreign sources of energy. Another goal seeks to better the environment by reducing automobile pollution. A provision in the proposed federal energy bill aims at helping to meet both of these goals. The provision is a renewable fuel standard which would require a certain volume of the U.S. gasoline market to be composed of renewable fuels. A renewable fuel standard would more than double the current market for ethanol.

### Louisiana

Ethanol was produced in Louisiana from 1984 to 1990 with a peak of 32 million gallons in 1986. When state subsidies ended in 1988, ethanol production was no longer economically feasible and the last plant ceased production in 1990.



Gasohol consumption also peaked in 1986 at 336 million gallons and has since declined to almost zero.



See the department's publication entitled *Ethanol in Louisiana 1993* for a more complete history of the ethanol industry in Louisiana. Contact the department for a copy<sup>2</sup>. There has been some renewed interest in ethanol in Louisiana and it may be produced in Louisiana again in the near future.

In 1994, the old Shepherd Oil refinery (converted to an ethanol plant) in Jennings, LA was purchased by Massachusetts firm BC International with plans to convert it into a 20 million gallon per year (MM GPY) biomass-to-ethanol facility. The plant would utilize mainly bagasse as a feedstock, although the process is able to use a wide variety of agricultural and paper or wood waste products. The patented BCI process uses a genetically engineered microorganism that breaks down complex sugars contained in biomass. These complex sugars cannot be broken down by fermentation. Fermentation is the process used in conventional ethanol plants that converts the simple sugars contained in sugar cane and starchy raw materials, such as corn, into ethanol. The ability to make ethanol from wood and cellulosic biomass such as bagasse, wood chips and waste paper opens up an opportunity to utilize much cheaper feedstocks than starch and sugar based crops. Due to the high yield of ethanol from the process, and the low cost of the feedstock, the ethanol produced at the facility is expected to be economically competitive with fossil fuels<sup>1</sup>. Financing for the project is still pending. The Louisiana State Bond Commission approved the issuance of \$120 million in bonds in February, 2000, but BCI couldn't find buyers for the bonds due to unfavorable market conditions. BCI has since switched to private financing and has secured \$100 million of the \$120 million needed to complete the project. As of now, construction is scheduled to begin in 2003 and start operating in mid-to-late 2004.

State Agriculture Commissioner Bob Odom was investigating the possibility of a 60 MM GPY ethanol plant near Lacassine, but the idea was scrapped when the estimated cost to build the plant came in too high. Dubbed "The Louisiana Green Fuels Project," the plant was to produce ethanol from sugar cane and other agricultural products and be constructed with proceeds from the sale of bonds. The bonds were to be paid off with profits from the sale of ethanol. Local officials are still working to keep the idea alive. With ethanol poised to replace MTBE as an oxygenate in reformulated gasoline and/or the passage of a federal

renewable fuels standard (discussed later), the plant would probably find a healthy market for its ethanol.

## **National**

The ethanol industry is growing with a record 2 billion gallons produced in 2002. Much of the current growth can be attributed to some states banning or considering banning the use of MTBE due to its propensity to contaminate ground water. MTBE is an octane enhancer and oxygenate that is used in over 80% of reformulated gasoline (RFG) to fulfill the federal oxygenate requirement for RFG. Ethanol is an alternative to MTBE used in about 15% of RFG. California was the first state to ban MTBE, although it has extended the deadline to 2004 out of fear of gasoline shortages. California petitioned EPA for a waiver of the oxygenate requirement for RFG but was turned down. New York has also petitioned the EPA for a waiver of the oxygenate requirement for RFG. They point to research that shows that RFG can be produced without oxygenates that meets Clean Air Act specs. The EPA has yet to rule in their case.

Other issues are also involved in the MTBE vs. ethanol debate. When blended in gasoline, the resulting gasoline has a one pound higher vapor pressure than gasoline blended with MTBE. This leads to increased evaporative emissions which is a component in ground level ozone (smog) production. This is generally only a problem in the summertime, thus the reason for vapor pressure limits for summertime RFG. When ethanol is blended with gasoline, pentane must be removed from the RFG base in order to comply with the vapor pressure limit. This causes a significant volume loss of the refiners stock and can lead to gasoline shortages and price spikes in areas using RFG made with ethanol. This is exactly what happened in the mid-west US during the summer of 2000<sup>4</sup>. Also, ethanol is soluble in water, and gasoline blended with ethanol will separate if contaminated with water. Pipelines usually contain some moisture. For this reason, ethanol must be shipped by train or truck and blended into gasoline near distribution points instead of blended at the refinery and shipped by pipeline.

The use of MTBE and ethanol in gasoline is largely the result of federal mandates, some of which may be about to change. After a failing last fall, the effort to revamp national energy policy has been resumed in the 108<sup>th</sup> Congress. Both House and Senate versions of an energy bill contain a renewable fuel standard which would require gasoline to contain a certain volume of renewable fuel. A renewable fuel standard would be a boon to the ethanol industry because the vast majority of renewable fuel used to meet the requirement would be ethanol. The House renewable fuel standard would require 2.7 billion gallons of renewable fuel in 2005 gradually increasing to 5 billion gallons by 2015. The Senate version would require 2.6 billion gallons in 2005 gradually increasing to 5 billion gallons in 2012. For perspective, total annual gasoline consumption is 130 billion gallons in the US and 2 billion gallons in Louisiana. Both versions include cellulosic biomass ethanol and biodiesel in their definitions of renewable fuel, and both versions consider one gallon of cellulosic biomass ethanol to be equivalent to 1.5 gallons of renewable fuel. Both versions also eliminate the oxygen requirement for RFG, but only the Senate version bans the use of MTBE (subject to state law). Overall, the language of the House and Senate energy bills are very similar. This makes it likely that an energy bill will be passed and sent to the president to sign. Even without passage of an energy bill, the ethanol industry is expected to continue to grow due to many

states phasing out MTBE. Ethanol producers are gearing up and expanding to meet the increased demand for their product.

## **Energy Balance Update**

The debate still rages over whether or not corn ethanol has a positive or negative net energy value (NEV). NEV is the energy contained in ethanol minus the energy required to produce the same volume of ethanol. Since the 1970's, many studies have been undertaken to calculate the NEV and results have varied greatly. Most of the newer studies report a positive NEV. Most recently, the USDA updated their 1991 study and came up with an NEV of 21,105 Btu/gal, up slightly from their 1991 study. The study is available online<sup>3</sup>. The newest USDA study identifies several factors that have led to the wide differences in NEV from different studies and found that most of the variation resulted from assumptions about farm production and ethanol conversion. According to the USDA study, studies that report negative NEV tend to use older data that do not reflect the advances made in farm production and ethanol plant efficiency.

1. University of Florida website: <http://www.napa.ufl.edu/98news/ethanol.htm>
2. LA Department of Natural Resources, Technology Assessment Division, Phone: (225) 342-1270, E-mail: [tehasmt@dnr.state.la.us](mailto:tehasmt@dnr.state.la.us).
3. *The Energy Balance of Corn Ethanol: An Update*, U.S. Department of Agriculture, Office of Energy Policy and New Uses, Washington, DC; July, 2002.
4. "Environmental Impacts for RFG Without MTBE or Oxygenates". William J. Piel, TEIR Associates, Inc. 2000.