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Cooperatives... Start Your Engines!

There are increasing opportunities for cooperatives to enter the biofuel industry. In particular, many cooperatives are debating the potential of ethanol and biodiesel production. However, several factors should be considered before venturing into this uncertain market.

Bioenergy, green energy, alternative fuels, biofuels—these are the new buzzwords in the energy and agriculture sector. Biofuels in particular have become a key form of green energy, particularly after President Bush called for their expanded production and use in his 2006 State of the Union address. These alternative fuels aren't just for the eccentric environmentalists anymore. Driving this expanding market is the need to reduce dependence on foreign oil supplies, reduce emissions harmful to the environment, improve air quality in urban areas, and create alternative markets for agricultural surpluses. With Texas as the largest consumer of petroleum products and one of the largest agricultural producers in the nation, it's not surprising that there is great interest in exploring the development of biofuel production facilities right here in the Lone Star State. However, the biofuel market is relatively new and many questions remain to be answered.



and processes are developed, production will expand to other organic sources, creating opportunities for farmers and investors throughout the country.

Biofuels represent opportunities not only for farmers, but also for struggling rural communities seeking to attract new industry. Communities that are located near ample source of feedstock and with easy access to transportation routes such as rail or barge are often deemed a good fit for biofuel production. Let's take a closer look at the two most common biofuels being explored in Texas: ethanol and biodiesel.

Ethanol

This biofuel is produced by transforming the sugar in grains and plants into alcohol. The process results in ethyl alcohol (or ethanol) as well as dried distillers grains (DDG) and carbon dioxide by-products. While the by-products have industrial uses, ethanol can be used as a replacement for unleaded petroleum fuel but is rarely used in its pure form due to its corrosive nature. Instead it is blended with unleaded fuel before it is sold. This alcohol/fuel blend is usually sold one of two ways.

Typically, it is used in a 10% ethanol, 90% petroleum fuel mix, or E10. Also known as gasohol, E10 uses ethanol as an oxygenate in fuel. Fuels were mandated to contain an oxygenate agent during winter months by the Clean Air Act Amendments of 1990. The two most common agents in use today are ethanol and MTBE (Methyl Tertiary Butyl Ether). MTBE has a

What Is A Biofuel?

A "biofuel" is a petroleum fuel replacement made from renewable sources. The most common forms of biofuel are ethanol and biodiesel. Ethanol made from corn and biodiesel made from soybean oil constitute the majority of biofuel sales. Consequently, the concentration of biofuel production in the United States has been in the Midwest. However, both can be made from a variety of feedstocks (crops or other organic material used as an input), potentially allowing for a wider scope of production. Even so, the current technology for biofuel production concentrates on ethanol from corn and biodiesel from soybeans. As new technology

lower oxygen concentration than ethanol and has been banned in some areas due to adverse environmental impacts. Ethanol, though more expensive and volatile, has replaced MTBE as the oxygenate agent of choice in these areas.

E85 ethanol (85% ethanol, 15% petroleum fuel) is another ethanol blend that is primarily used in flex-fuel motors. Flex-fuel motors have been engineered to withstand the corrosive ethanol and utilize it properly. Special sensors in the fuel lines of the flex-fuel motor adjust its operation whether it's burning petroleum fuel or an ethanol mix. Ethanol is nothing new to the automobile industry; Henry Ford made the Model-T to run on grain alcohol. Adjustments were made when cheap petroleum fuel became the consumers' choice. Only in the last 5-10 years has ethanol production truly regained momentum. Currently the ethanol industry is poised for expansion as new technologies are on the rise that will enable a greater yield of ethanol from sources that were heretofore economically infeasible. These "cellulosic" technologies could utilize feedstocks like rice hulls or cotton gin trash.

Biodiesel

It is a common misconception that biodiesel is "just like ethanol, but for diesel engines." Biodiesel is produced using a completely different process! Where ethanol is the result of fermentation, biodiesel relies on a process called transesterification. This process transforms fats and oils from plants or animals into biodiesel and a glycerin by-product. Once again, the by-product has industrial uses, while the modified oil is used as a fuel. Obviously the crop feedstocks that are economically attractive are those that contain a high amount of oil. The final product can be used in its B100 (100% biodiesel) form in a diesel engine, but most automobile manufacturers will only allow the use of a blend without voiding the vehicle's warranty. Biodiesel is commonly blended in B5 (5% biodiesel, 95% diesel) and B20 (20% biodiesel and 80% diesel). The B5 blend uses the biodiesel as a lubricant, allowing the engine to run with less wear and tear.

The B20 blend is the maximum allowed by most vehicle warranties and will provide superior lubrication as well as reducing engine buildup. In fact, when biodiesel is used in older engines, the fuel filter will have to be replaced more often at first because the biodiesel in the mix will clean off any residues. Also, new hoses may have to be put in to prevent corrosion from the fuel blend. Older rubber hoses will not stand up to the corrosive nature of the biodiesel for very long

and leaks can occur. Engineers are still working to determine the kind of hose that will hold up best, but for now the recommendation is just to replace them with new ones. The biodiesel industry is still considered to be in its infancy here in the U.S....but it is growing.

This Sounds Too Good To Be True

Whether ethanol or biodiesel, biofuel production is not without its challenges, and any source of information that tells you it is guaranteed to be profitable should be treated with caution. At this time, biofuels are heavily subsidized and some plants depend on those subsidies to be profitable. When analyzing a potential investment ask yourself, what if the subsidies were reduced or taken away all together? Could this plant still turn a profit? Biofuels have historically been more expensive to produce, and therefore more expensive at the pump. With today's increasing fuel prices, and a reduced likelihood that we will see their historic levels again, biofuels have a chance to compete. But should prices drop, biofuels will lose some of that competitive edge.

Feedstock cost can comprise up to 80% of the total cost of biofuel production. Therefore, the cost of biofuel will readily fluctuate with the price of the feedstock used in production. It is possible that, with expanded biofuel production, feedstock surpluses will not return to historic levels and Midwestern states that have previously been net exporters of feedstocks could potentially become net importers. As this happens, grain markets as we currently know them will experience shifts in price differentials.

In the future, the expansion of biofuel markets will impact commodity prices, feed prices, and international trade in commodities. There are definite opportunities in the biofuel markets, but each should be carefully considered. Those planners who recognize and take into account these challenges will be able to better meet them as they come along. It will be these visionaries who will take the best advantage of the opportunities available in biofuel production, although not without risk. Early entry and established business-to-business relations are likely to be important factors of success in this industry.

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Feedstock Options for the Two Most Common Types of Biofuels

| Ethanol | Biodiesel |
|-------------------|---------------------------------------|
| Cane Sugar | Virgin Oils |
| Beets | Corn |
| Corn | Cottonseed |
| Sweet Sorghum | Palm |
| Milo | Peanut |
| Cellulosics | Rapeseed (Canola) |
| Sugar Cane Stalks | Yellow Mustard |
| Corn Stover | Safflower |
| Waste Paper | Soybean |
| Hays | Sunflower |
| Grasses | Fats |
| Trees | Poultry Fat |
| Sawdust | Tallow |
| Straws | Lard |
| Forestry Waste | Fish Oil |
| Rice Hulls | Used Cooking Oil |
| Green Algae | Off Quality and Rancid Vegetable Oils |

Making it Work

It is up to you whether or not a biofuel project is worth your investment. Each proposed project will be different, but there are a few key characteristics you should look for. First, how secure is your source of the feedstock being used? A plant that is going to depend solely on

feedstocks shipped in from the Midwest may find itself with a shortage in the future as biofuel facilities are built closer to the source. Therefore, at least some amount of the feedstock or oil should come from local producers. Second, are you near a local market for both the fuel and the by-products? Transportation costs can take a deep bite out of profit margins. This might require larger scale economies, larger facilities, and larger retail customers. In addition, local support can mean the difference between success and failure for a start-up business.

Finally but perhaps most importantly, why is the plant being built? There could be several reasons. For many private companies operating in Texas the reason is pure profit. However, for farmer groups looking to invest the reason may not be that black and white. High fuel prices are causing some cooperatives that sell fuel and feedstocks to consider biofuel production as a "fuel hedge". They can blend their existing petroleum fuel with the biofuel they produce, providing benefits to members in both environmental and monetary terms. Other cooperatives are considering biofuel as the next big agricultural industry. This means a new market for their crops and added value coming back to the producer. There is always risk involved with entering an emerging market like biofuels, but if a plant is positioned in the right place at the right time it could potentially benefit farmers and rural communities in Texas.

How Do Cooperatives Fit In?

Cooperatives are uniquely positioned with the farmers who produce biofuel feedstocks. Farmers and cooperatives that feel they are uniquely positioned to take advantage of this market are exploring the possibility of creating cooperatives or LLCs. The cooperative brings jobs and revenue dollars to their own rural communities, as well as capturing more of the final value-added biofuel dollar for their producers. If your group is interested in exploring a biofuel cooperative, there are resources available to assist you.

For more help, contact:

- ♦ The Texas Center for Cooperative Development, Dr. John Park (979) 845-1751
- ♦ The Agricultural and Food Policy Center, Dr. Joe Outlaw (979) 845-5913
- ♦ USDA Rural Development, Billy Curb (254) 742-9775
- ♦ Or your local County Extension Agent