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Market and Trade Data

Strict Government Control Characterizes Chinese Biofuel Development

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While China views biofuel production as an essential and strategic component of a secure economy and diversified energy policy, concerns about the impact on food self-sufficiency have slowed development of the biofuel sector.

Government Dominates Production, Policy

The central government regulates the biofuel market and has confined production facilities to state-owned industry. China’s NDRC (National Development and Reform Commission) has been charged with guiding production and consumption. A National Ethanol Promotion Team promotes biofuel development, particularly E-10 (fuel made up of 90 percent gasoline and 10 percent ethanol) for automobiles.

Though the industry is new, government production goals are clear. China expects biofuels to meet 15 percent of its transportation energy needs by 2020. The ability to meet this overriding objective depends on competing uses of inputs, including corn, wheat, sugar, cassava, sweet sorghum, and oilseeds.

Biodiesel Lags Ethanol

While ethanol production and policy have been developed over the past 20 years, biodiesel production just began to be addressed in 2006. But biodiesel production is expected to expand rapidly as China now consumes twice as much diesel as gasoline. Higher diesel use is a result of the widespread use of trucks, particularly for farms. Mechanized farm equipment has also contributed to increases.

In 2005, China’s ethanol production came to 920,000 metric tons, with production capacity at 1.02 million tons. Biodiesel production trailed at an estimated 100,000-200,000 tons. Under China’s biofuel development policies, ethanol production should increase to nearly 4 million tons by 2010, and biodiesel to 2 million tons.

Currently, there are four fuel ethanol-producing plants in China, with three more under construction. Most provincial governments are considering constructing their own plants. There are only two major biodiesel plants in operation. One plant can produce 40,000 tons per year, with another capable of 10,000 tons. The remaining production by varying research and developmental entities is sketchy and largely experimental.

Key Objectives of China’s Biofuel Program

China’s biofuel policy is being guided by several objectives, including:

- improving welfare of Chinese rural citizens
- strengthening China’s energy security and reducing oil dependence
- mitigating noxious emissions

Crude Oil Consumption Up

China consumed 323 million tons of crude oil in 2005, which included 119 million tons of imports. The average annual growth rate for gasoline and diesel from 1990 through 2004 was 6.8 percent and 10.1 percent, respectively.

China temporarily banned gasoline imports in 1999, because of domestic overproduction of gasoline. While there is no ban on gasoline imports now, only four state-owned companies are licensed to import gasoline. Gasoline consumption, principally for passenger vehicles, was 50.35 million tons in 2004, up 17.4 percent from the year before. Gasoline exports came to 5.75 million tons, 28.3 percent lower than the year before. The trend toward lower gasoline exports is expected to continue as domestic demand increases.

Inputs for Ethanol

Corn inputs now account for 90 percent of the feedstock used in producing ethanol, with wheat a distant second. This dependence on corn might impact China’s feed industry during upcoming years.

Ethanol production already uses up 40 percent of the total industrial corn use in China.

The use of sugar for ethanol production is unlikely due to environmental concerns and inefficient production technologies. Wheat will not likely be a large component in biofuel production because of high domestic demand for food, its relatively low efficiency production rate, and government policies.

Developmental Alternates for Biofuel

U.S.-based SunOpta recently announced the sale of the first cellulosic ethanol plant in China. Cellulosic ethanol can be produced from almost any organic matter, including agricultural waste, grasses, sewage, sludge, switchgrass, plant stalks, and trees. Not yet commercially viable, this first cellulosic plant will be running by 2008, producing lignocellulose ethanol.

An ethanol plant in southern China, which is a joint venture of the provincial and national governments, will open in October 2007 with production capacity of 110,000 tons per year. With cassava as the main input, the plant is expected to supply much of southern China when it reaches production of 1 million tons per year in 2010.

China's current cassava production is estimated at 7.5 million tons per year. Increasing land planted to cassava (it can grow on marginal land) and technological advances could eventually add 21 million tons to cassava production. In the meantime, cassava imports from Thailand, Vietnam, and Indonesia are surging, up from 257,000 tons in 2000 to more than 3.3 million tons in 2005.

Drought-tolerant sweet sorghum also promises to be an important feedstock for ethanol production, though techniques for achieving the best efficiencies are still being developed.

Diesel Usage Doubles Gasoline

Still in early phases of testing and development, biodiesel production is not meeting demand due to the lack of input resources. China is a net importer of all major edible vegetable oils, an important source for biodiesel. To remedy this shortage, China has set up a special development fund to encourage vegetable oil production. Biodiesel produced from animal fats and oils holds great potential for the future, but is not being explored presently.

There is some minor usage of jatropha (a genus of 175 succulents, shrubs, and trees), Chinese pistachio, and rapeseed to produce biodiesel, but waste cooking oil accounts for the 80,000 tons of biodiesel produced last year.

The Chinese government has tried to purchase more palm oil waste from Malaysia for biodiesel production. Rapeseed, heavily used in European biodiesel production, is a promising input for Chinese biodiesel. If China planted rapeseed in the off-season in its 29-million hectare central region, this crop could produce more than 18.5 million tons of biodiesel.

Trade Limited, But This Could Change

China's minor biofuel exports will fall even more as domestic demand picks up. Due to high tariffs and restrictive import policies, ethanol imports are unlikely in the short run. However, China has been watching the success of Brazil's fuel ethanol program and its exports — which account for half of international biofuel trade.

Regardless of biofuel imports, feedstock imports for biofuel production will rise in China over the next few years to meet increasing demand for fuel ethanol production.

The ultimate arbiter of feedstocks will be economics. China will produce biofuels based on inputs that it can either grow domestically, or secure easily. Corn, sugar, oilseeds, sorghum, wheat, and cassava will likely take on new importance as the biofuel industry in China develops. However, bottom line costs will ultimately determine which inputs and technology dominate the industry. ■

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