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Report Highlights:
China's fuel ethanol production is estimated to rise to 1.55 million MT in 2008, an increase of 11 percent compared to 2007. Food security and inflation are the main concerns on the government's agenda. Escalating food prices beginning in 2007 triggered a series of policy shifts in industrial use of grains. To reduce industrial grain consumption, the government halted the approval of new grain processing projects (including fuel ethanol plants) in 2007 and 2008. Future bio fuel production will be derived from non-grain feed stocks.

Includes PSD Changes: No
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Annual Report
Beijing [CH1]
[CH]

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Executive Summary

China's fuel ethanol production is estimated to rise to 1.55 million metric tons (MT) in 2008, an increase of 11 percent compared to 2007. Food security and inflation is a top priority on the government agenda. Increases in food prices and in particular in grains triggered a series of policy shifts in industrial grain usage. To reduce industrial grain consumption, the central government stopped approval of any new grain processing projects (including fuel ethanol plants) in 2007 and 2008.

In 2007, the State Council did not approve the draft 11th five year plan (2006-2010) for the renewable energy sector submitted by the National Development and Reform Commission (NDRC). Instead, NDRC issued a Long and Mid-Term Planning for Renewable Energy plan (Renewable Energy Plan). According to this Plan, the utilization of non-grain fuel ethanol will reach 2 MMT and bio diesel utilization will reach 200,000 MT by 2010. By 2020, the total utilization of fuel ethanol (grain based or non-grain based) will reach 10 MMT and bio diesel utilization will reach 2 MMT. This mandate is included in the official Renewable Energy Plan which provides the guidance for China's bio fuel production and development into 2020.

According to the Renewable Energy plan, before 2010, NDRC will conduct trial projects in different regions on non-grain feed stocks like tubers (sweet potato and cassava), sweet sorghum, and oil bearing tree nuts. Many provinces and companies (petroleum companies or other large-scale state entities) are interested in bidding for non-grain bio fuel plants. However, only one Guangxi province ethanol plant, using cassava feedstock gained approval, began commercial operations in April of 2008.

To date, there are five plants licensed for fuel ethanol production. Among them, there are four plants (in Jilin, Heilongjiang, Henan, and Anhui) that use grain-based feedstock. Their production totaled around 1.4 MMT in 2007. It is estimated that 80 percent of their production is corn based and the remaining 20 percent is wheat or rice based. The fifth plant (in Guangxi), which started trial operations in December 2007, was designed to produce at an annual capacity of 200,000 tons, using only cassava as its feedstock. Industry sources estimate annual fuel ethanol production for this plant will reach 130,000 tons by the end of 2008, as prescribed in current E10 mandate (10 percent ethanol blended into fuel) the province recently implemented.

State policies are clear about bio fuel development (including fuel ethanol and bio-diesel) not competing with crops for human consumption. Future development of bio fuel feedstock will likely come from the marginal, less arable land. The use of tuber crops and sweet sorghum is seemingly realistic, given China's success in demonstration projects.

Note: After the Renewable Energy Plan's announcement, NDRC will not approve any new plants that use corn or other grains as feed stock, which virtually capped the usage of grains (corn, wheat, and rice) at the current capacity. For a complete report on China's grain situation, please refer to Post's GAIN report CH8012.

The 2006 and 2007 bio fuel report (CH6049 and CH7039) provides extensive insight into China's ethanol production. Please refer to these reports as background.

China's bio fuel situation

China views bio fuels as essential and strategic components of a secure economy and diversified energy policy. To ensure the development of bio fuels, the central government has taken an active role in regulating both the supply and demand side of the bio fuel market and has limited ownership of production facilities to the state industry. NDRC has been China's leader in the development of bio fuels, guiding future energy production and consumption in China, as well as industry's participation in the sector.

There are five fuel ethanol plants (in Jilin, Heilongjiang, Henan, Anhui and Guangxi) currently licensed for operation. Among them, there are four plants (grain based), as they have reached full capacity, their total usage of corn (and wheat) for ethanol will stay at the current level. The fifth plant (in Guangxi), began trial operations in December of 2007, with designed annual capacity at 200,000 tons, based entirely on cassava feedstock. Industry sources estimate that its annual fuel ethanol production will reach 130,000 tons by end of 2008, as required by a provincial E10 mandate.

Bio fuel development hindered by food supply concern

Food security has been a top issue on the central government agenda. Escalating food prices since 2007 have triggered a series of policy shifts in the industrial use of grain. To reduce industrial grain consumption, the government denied approval of any new grain-based processing projects (including fuel ethanol plants) in 2007 and 2008.

State policy prescribed that bio fuel development (including fuel ethanol and bio-diesel) should not compete for arable land designated for crops for human consumption. The future development of feedstock for bio-fuel will necessarily have to come from the marginal, less arable land, and therefore the increase of tuber crops and sweet sorghum is a realistic expectation. Some provincial governments and private companies are experimenting with sweet potato and sweet sorghum as feed stock for bio-fuel production. However, current production of such crops is far from sufficient for scaled industrial ethanol production. The supply of such feed stock has been seasonal, low yielding and simply not suitable for industrial production. Given the current crop productivity and transportation logistics, the feasible ethanol plants' capacity should not exceed 100,000 MT annually, according to industry estimates.

Pricing regime leaves ethanol producers no profit without government subsidy

To maintain low energy costs for all sectors, the central government has been offering subsidies to state refineries on gasoline and diesel production for decades. As a result, domestic gasoline and diesel prices have been lower than international prices by a range of 30-60 percent. The government evaluates international oil prices periodically to determine a benchmark price for gasoline and diesel for domestic distribution. The fuel ethanol price is linked to the set government fuel price and then marketed by state designated retailers. The five fuel ethanol producers still receive government subsidies to cover losses under the current pricing regime. This pricing regime also functions to discourage the private sector's investment in fuel ethanol production.

Over the long term, the government is expected not to intervene in determining the price of fuel. However, given sharp inflationary pressure, and the substantial price difference between fuel in China and that abroad, it will take years for the domestic fuel price to near the international market price. Therefore, fuel ethanol production in China will continue receiving subsidies from the government in the coming years. Simply put, fuel subsidies and price support programs will continue to mandate the development of China's fuel ethanol sector.

Current subsidy program for fuel ethanol production to scale down

In 2007, the subsidy for fuel ethanol production set by the central government reached $196/ton (RMB1,373), while it was approximately $242/ton (RMB1,700) in 2006, and $285/ton (RMB2,000) in 2005. In 2008, instead of applying a fixed subsidy, the government implemented a flexible subsidy program for all five fuel ethanol producers. According to the program, the final subsidy level will be based on the actual evaluation of each individual plant's performance. The evaluation is scheduled in November of each year. The program is designed to make more efficient use of government funding to the sector.

Currently, ten provinces participate in the fuel ethanol program. These ten provinces will remain the priority for use of an E10 gasoline (with a fuel/ethanol mix rate of 10 percent). Six of these provinces use E10 within their entire provinces while four provinces have only partly adopted the product. Close to full adoption by these four provinces remains a priority for the government's fuel ethanol program.

Fuel ethanol production

Table 1 shows the expansion in China's fuel ethanol production during the five year period 2003-2007. Although fuel ethanol production continues to expand, it has begun to taper off in 2008. Between 2006 and 2007 there was an 8-percent growth in national ethanol production.

Table 2 provides a geographic breakdown of the production facilities within China in terms of production capacity. It also gives an estimated production data for 2008. The Jilin province ethanol plant has the largest processing capacity in China with an output of 500,000 MT/year. In 2007, a new plant opened in Guangxi province using cassava as a primary feedstock. Its initial processing capacity will be 130,000 MT in 2008. Guangxi province plans to increase ethanol production (based on cassava) with the goal of reaching 1 MMT by 2010. Industry sources report that another plant using sweet potato as feedstock will be submitted for approval from the NDRC, and if approved, the plant, located in Hebei, might begin construction within 2008. The plant will have an annual capacity of 100,000 tons.

Table 1. A historical look at China's fuel ethanol production

Year	Production Quantity	% Increase from Previous Year
2002 and before	Official fuel ethanol production began in 2004. There is little recorded fuel ethanol production before 2002.	NA
2003	<20,000 MT/year	
2004	300,000 MT/year	1,400%
2005	920,000 MT/year	206%
2006	1,300,000 MT/year	41%
2007	1,400,000 MT/year	8%

Table 2. Current Fuel Ethanol Production

Location *(Province, City)*	Company Name	Principal Feedstock	Estimated 2008 Production *(MT/year)*	2008 Production Capacity	Supply Location
Heilongjiang, Zhaodong	China Resources Alcohol Co.	Corn/Rice	180,000	180,000	Heilongjiang
Jilin, Jilin	Jilin Fuel Ethanol	Corn	420,000	500,000	Jilin

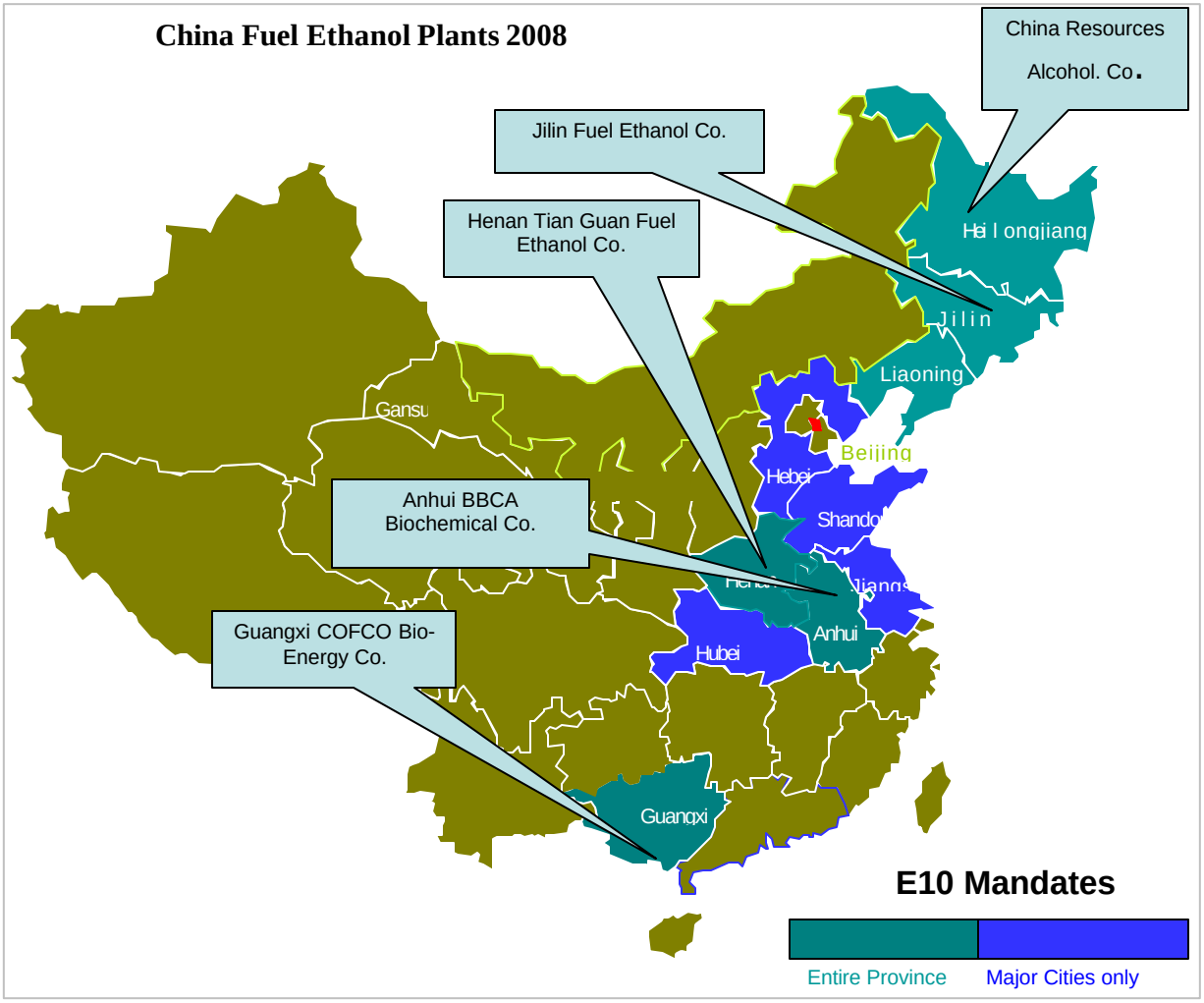
	Co.				Liaoning
Henan, Nanyang	Henan Tian Guan Fuel-Ethanol Co.	Wheat	420,000	450,000	Henan
					Hubei (9 cities)
					Hebei (4 cities)
Anhui, Bengbu	Anhui BBCA Biochemical Co.	Corn	400,000	440,000	Anhui
					Shandong (7 cities)
					Jiangsu (5 cities)
					Hebei (2 cities)
Guangxi	Guangxi COFCO Bio-Energy Co.	Cassava	130,000	200,000	Guangxi
Total:			1,550,000	1,770,000	

Sources: Industry Sources

**Note 1: The list of cities with an E10 mandate for each province runs as follows:*

- **Hubei***: Xiangfan, Jingmen, Suizhou, Xiaogan, Shiyan, Wuhan, Wichang, Huangshi, and Ezhou*
- **Hebei***: Shijiazhuang, Baoding, Xingtai, and Handan (locations supplied by Henan)*
- **Shandong***: Jinan, Heze, Zaozhuang, Linyi, Lioacheng, Jining, and Tai'an*
- **Jiangsu***: Xuzhou, Lianyugang, Huai'an, Yancheng, and Suqian*
- **Hebei***: Canzhou and Hengshui (locations supplied by Anhui)*

*Source: Law Concerning Testing for the Extensive Use of Ethanol Blended Gasoline for Automobiles and the Regulations Concerning the Conduct of Testing for the Extensive Use of Ethanol Blended Gasoline for Automobiles



Alternative/non-grain feed stocks for ethanol production

Compared with grains (corn, wheat, and rice), non-grain feed stocks such as tubers and sweet sorghum have a higher ethanol yield.

Table 3. Current Fuel Ethanol Yield Data

	Crop Yield MT/ Ha	Ethanol Yield MT / ha	DDGS MT / ha
Corn *	5	1.6	1.6
Tuber (Cassava)	22.5	3	NA
Fresh Sweet Sorghum	60-90	5	NA

Note: The average corn yield in China is about 40 percent lower than the U.S biotech corn. It is highly unlikely that in the short term, China will approve any biotech grain crops for commercial production. Therefore, the yield improvement for domestic grain crops in China will be limited. This low crop yield partially impacts the productivity and future grain-based ethanol production in China.

The Cassava Situation in Guangxi Province

According to industry sources, the global average cassava yield is 25 tons/Ha, however, the yield in China falls short of that average to 20 tons/Ha, which indicates a great potential for improvement in yield and variety development. The average yield in Guangxi is 22.5 tons/Ha and with 60 percent of national total production in Guangxi (which has 400,000 Ha designated for cassava), annual production is about 9 MMT tons per year. Given the strict state policy on bio fuel feed stock usage or impact on arable land, the availability of marginal land to produce cassava in Guangxi province is about 2 million Ha with average yield expected to reach 30 tons/ha in the short term. The provincial government has made the 11th Five Year Plan (2006-2010) goal to produce 1 million tons of ethanol using cassava feedstock. The initial output now supplies Guangxi. Furthermore, the provincial government plans to provide fuel ethanol to its neighboring provinces including Yunnan, Guizhou, and Guangdong, principally using cassava.

Pilot projects are ongoing in poor and remote areas of Guangxi Province to promote cassava production. The provincial government is promoting better planting practices and crop management with a focus on higher yields and greater starch content characteristics. In Guangxi, three tons of fresh cassava equals one ton of dry cassava. Seven tons of wet cassava can produce one ton of fuel ethanol or approximately 420 gallons of ethanol per acre. Most cassava is grown on baron land without irrigation, and the production capacity per hectare is 23 tons. Post estimates that the expansion could be constrained by the availability of arable land or competing cash and grain crops. To maintain the profitability for both cassava farmers and ethanol plants, government support program for cassava production will be needed to ensure the sector's future development.

The imported cassava price averaged about $200/ton in the first quarter of 2008, a 50-percent increase over the previous year, while China's cassava imports in the first quarter of 2008 declined by 70 percent to 600,000 tons as compared with the first quarter of 2007.

China's Cassava (071410) Imports from the World by Metric Ton 2002-2008							
	2002	2003	2004	2005	2006	2007	2008
Total Imports	1,760,294	2,368,260	3,442,412	3,335,415	4,950,435	4,625,427	**757,561**
Thailand	1,425,371	1,874,362	2,734,389	2,695,576	3,864,203	3,202,647	553,906
Vietnam	212,878	453,132	522,296	411,573	941,274	1,279,470	131,181
Indonesia	122,040	40,766	185,728	228,265	144,784	139,124	67,247

**Note: 2008 data is for January to April only*

Sweet sorghum, a potential feedstock for ethanol production

As table 3 indicates, sweet sorghum can potentially render the highest ethanol yield among all alternative non grain feed stocks in China. However, its availability is constrained by limited arable land and the seasonal supply, hence hindering large scale production in China. To extend the processing season, Chinese researchers and the industry are working on a prolonged storage methodology for fresh sweet sorghum. So far, there are no commercial ethanol plants based on sweet sorghum.

Cellulosic Ethanol

Similar to other countries, cellulosic ethanol is not commercially viable in China. Currently, there are two major testing plants in China, located in Henan and Heilongjiang province respectively. The plant in Henan is in a trial stage of 300 tons annually, taking wheat straw as feed stock, while the plant in Heilongjiang, with a trial stage of 500 tons annually, uses corn stover as feed stock. Both plants were jointly funded by the government and state companies. State media reports that these plants are planning to expand their trial capacity in 2008, however, industry experts are not confident that the technology will materialize commercial production of cellulosic ethanol in China in the short term.

MOU signed on bio-fuel cooperation activities between the United States and China

In December 2007, the United States Department of Agriculture (USDA), Department of Energy (DOE) and NDRC signed a Memorandum of Understanding (MOU) on cooperation in bio-fuel development. Based on this MOU, the two countries have proposed to cooperate closely in the scientific, technical and policy aspects of bio-fuel development. The two countries have proposed the following six areas for cooperation on bio-fuel development.

First: establishment of the methodology and index system for a biomass resource assessment suitable for conditions in both countries, and the formulation of a unified assessment standard.

Second: exchange of scientific and technical information on the development of biomass feedstock production (including breeding and planting technologies of quality feedstock seeds), feedstock-to-bio fuels conversion processes; and cellulosic ethanol technology.

Third: technical information exchange on bio fuels and bio-chemicals.

Fourth: strategic studies on promoting agricultural development for biomass feedstock on a voluntary basis.

Fifth: exchange of technical information on the rural development aspects of bio fuels development in the United States and China.

Sixth: establishment of a bilateral dialogue on bio fuels, focusing discussion on United States-China bio fuels cooperation, capacity building, and information exchange.

USDA is also working with China's Ministry of Science and Technology (MOST) to establish a US-Sino Center for Bio-Fuel Research to establish more cooperative activities between the two countries.

Biodiesel Production

The government announced the voluntary bio-diesel standard (for 100 percent bio-diesel product) in July 2007 as guidance for bio-diesel production in China. However, feedstock for bio-diesel production is scarce in China, given that China is a net importer of vegetable oil

such as soy and palm oil for food consumption. Currently, the main feed stock is waste cooking oil from restaurants, which is difficult to collect on a commercial scale for bio-diesel production. State media reports that winter rapeseed produced by fallow field in some southern provinces could be potentially used for bio-diesel production, however the government will not encourage its development because its usage might compete with human vegetable oil consumption.

Present Production Limited

The biodiesel production in 2007 is estimated at around 300,000 metric tons. Almost all of the production is based on animal fat or waste vegetable oil from oil crushing plants or restaurants. The product is low quality and often times not adequate for fuel use. The higher quality product is used as a low quality solvent, or more commonly, as an additive to coal in thermal power plants or rural industrial cafeterias, where coal is used for cooking.

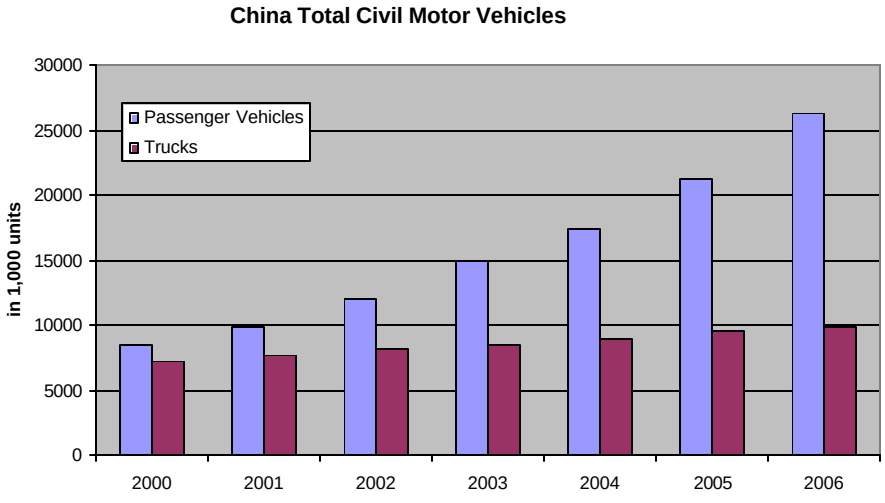
Currently, biodiesel plants are small-scale, ranging from 100 to 20,000 MT of production. These plants usually operate for only a few months out of the year due to lack a sufficient supply of feedstock. The lack of feedstock is the result of the short supply of edible vegetable oils. China is the largest importer of soybeans and imports significant quantities of other oil based products. Feed competes for demand for animal-based fat. As a result, Post forecast that Chinese government will not provide incentives for biodiesel production in the foreseeable future.

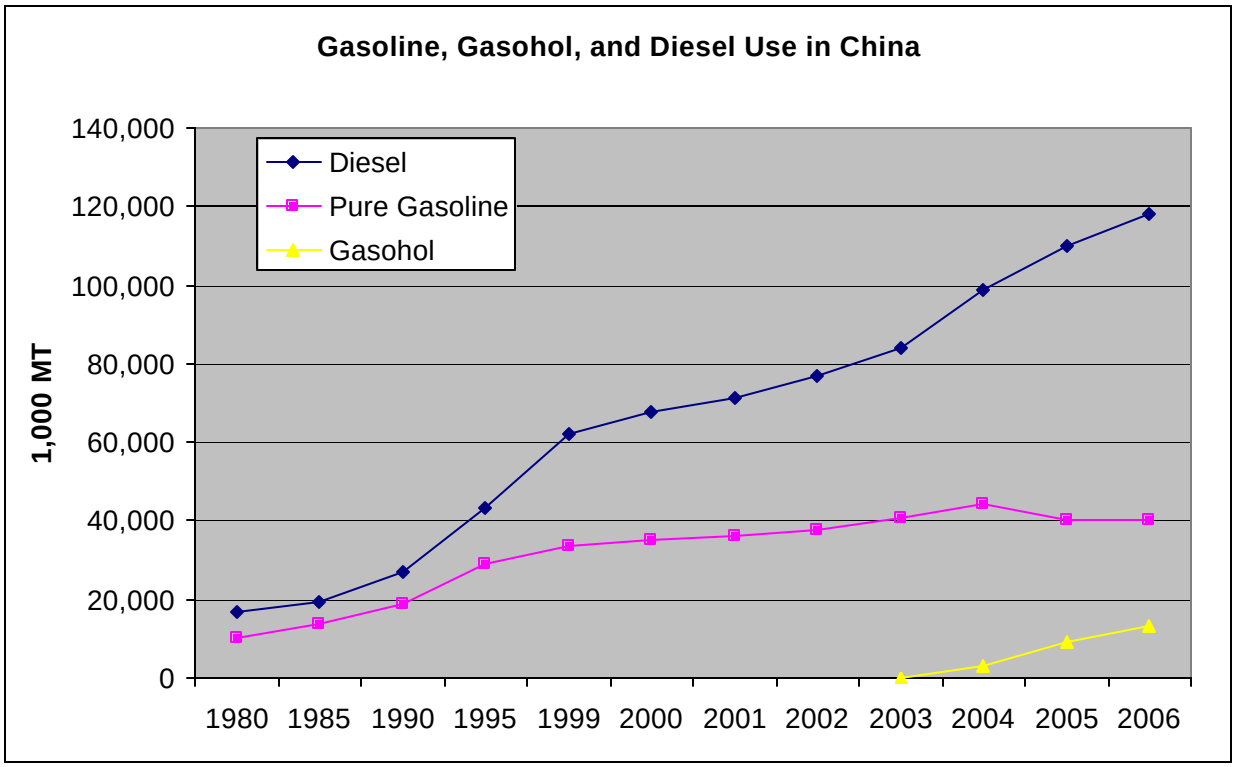
Potential oil seed use for biodiesel in the long-term

The government has made a policy that the feedstock production should not compete with grains production. Some provinces or large state owned companies aims to develop oil bearing tree nuts on marginal land. For instance, jotropha was selected as a potential feedstock for bio-diesel production in some southern provinces. However, constrained by the poor growth conditions, it will take five years to have large-scale supplies of feedstock, according to industry sources. There are no national or provincial programs to promote the use of biodiesel as transportation fuel. Post forecasts that the Chinese government will not promote a large-scale fuel biodiesel use in the near future.

Fuel Use in China

Diesel is the primary fuel consumed in China with close to 120 million MT consumed in 2006. Pure gasoline consumption was approximately 40 million MT in 2006. Both diesel and gasoline consumption in China have increased substantially since 1980 with a six-fold and four-fold increase in consumption, respectively. Pure gasoline use has plateaued somewhat over the last four years as gasohol (E10) consumption has grown. During this timeframe, automobile use in China has increased on average 15 percent during 2001-2006 annually.

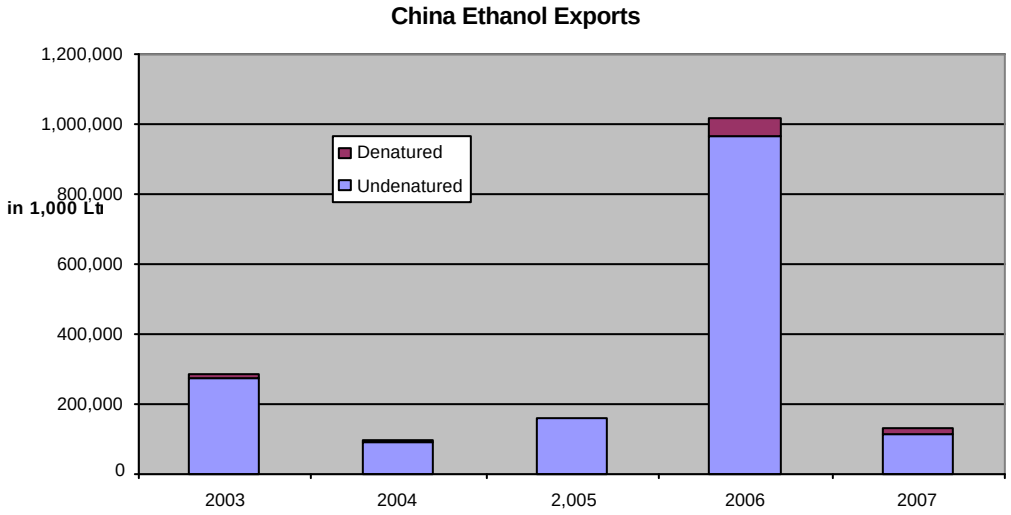




Source: China Energy Statistical Yearbook

Trade in Ethanol

Chinese ethanol exports in 2007 dropped by 88 percent from the previous year, as a result of export rebate removal. In 2007, to discourage the expansion of grain-processing sector, the government removed a 13 percent VAT rebate on ethanol exports. The rebate removal cut profits substantially for ethanol exports. The policy will remain unchanged in 2008 due to rising food price pressure. Partially due to freight advantages to the neighboring markets, Japan, Korea and other Asian countries are predominant export destinations for Chinese ethanol (mainly food grade).



Ethanol imports to China have been relatively minor in recent years. Due to the relative cheaper feed stock for ethanol production in China, imported ethanol is not price competitive.

China Ethanol Export in 2003-2007 in 1,000 LTR						
HTS#	Description	2003	2004	2005	2006	2007
	Total Ethanol	284,101	96,912	162,204	1,017,779	129,973
220710	Undenatured	276,084	91,596	158,654	970,721	110,718
220720	Denatured	8,017	5,316	3,550	47,058	19,256
China Ethanol Import 2003-2007 in 1,000 LTR						
HTS#	Description	2003	2004	2005	2006	2007
	Total Ethanol	4,316	4,253	19,590	7,972	678
220710	Undenatured	2,258	2,021	15,936	5,930	154
220720	Denatured	2,058	2,232	3,654	2,042	524

China Ethanol Export by Destination in 2002-2006 in 1,000 LTR					
Country	2003	2004	2005	2006	2007
World	284,101	96,912	162,204	1,017,779	129,973
Korea, South	80,664	16,881	39,144	191,642	50,304
Japan	152,755	49,975	79,375	113,665	35,420
Singapore	15,189	46	5,063	59,923	21,659
Taiwan	26,363	21,909	22,655	41,811	15,592
Korea, North	1,690	6,844	14,648	9,433	5,588
India	83	142	164	46,000	356
Others	7,358	1,115	1,155	555,304	1,055

China Ethanol Imports by Destination in 2003-2007 in 1,000 LTR					
Country	*2003*	*2004*	*2005*	*2006*	*2007*
World	4,316	4,253	19,590	7,972	678
Italy	0	0	1	0	220
Japan	1,827	1,900	1,807	1,802	179
United States	31	25	35	149	119
Germany	7	32	31	91	68
Australia	33	1,877	108	66	32
Malaysia	3	0	7	3	16
Netherlands	18	15	7	10	15
Korea, South	24	40	992	29	12
South Africa	0	0	11,610	1,240	6
Singapore	54	35	16	10	5
Others	2,319	327	4,975	4,573	6

Overall Ethanol Production

Total ethanol production in 2007 is estimated at 6 MMT. Among them, 1.4 MMT is denatured for fuel ethanol use, about 2.5 MMT for food use. The reminder is used for industrial and surgical use. About 50 percent of total ethanol production is based on grains (mostly corn, but including sorghum, wheat, and rice) with the remainder based on tubers, including

cassava and sweet potatoes. Industry sources estimate that the sector's total capacity reached 11 mmt in 2007, while actually running at about 60 percent capacity.