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China's 2014 Fuel Ethanol Production is Forecast to Increase Six Percent

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Report Highlights:

China's 2014 fuel ethanol production is forecast to reach 2.8 billion liters, up six percent from the previous year due to fuel consumption growth in provinces with a blend mandate. 2014 biodiesel production is forecast at 1.13 billion liters, an increase of only five percent from last year, as producers react to lower profits. Fuel ethanol production is lagging behind the government's 12th five year plan due to shortage of non-grain feed stocks and policies that limit grain-based ethanol production. China imported a 10,500 ton shipment of ethanol in early 2014, reportedly as part of a trial study by a state oil company. Future imports, while economically viable, will require changes to national energy policies and regulations.

Post:
Beijing

I. Executive Summary:

China's 2014 fuel ethanol production is estimated to reach 2.8 billion liters (2.2 million metric tons), up six percent from the previous year due to fuel consumption growth in provinces with a blend mandate. 2014 biodiesel production is forecast at 1.13 billion liters, an increase of only five percent from last year (compared to 18 percent growth in 2013) as producers react to lower profits. Biofuel production accounts for less than one percent of China's liquid fuel production and is below targets set in the 12th Five Year Plan. Feedstock shortages have been the largest constraint on biofuel production. There have been no new policies or incentives announced for the sector in recent years.

Most ethanol in China is still produced from grains (76 percent from corn and 14 percent from wheat). The government, concerned about maintaining self-sufficiency in grains, has promoted the use of cassava, sweet sorghum, and other non-food grain feed stocks in the biofuel sector. China's first sweet sorghum ethanol plant started operation in June 2014 in Inner Mongolia, supplying fuel to three cities. Cassava and sweet sorghum now account for eight and one percent of ethanol production respectively. Cellulosic ethanol from corn cobs accounts for another one percent of production.

China imported a 10,500 ton shipment of ethanol in early 2014, reportedly as trial by a state oil company to study the economics of importing ethanol. The trial proved that imports are feasible and economically viable, but resulted in scrutiny from the government as current regulations prevent the use of imported ethanol in the transportation sector. Future imports will require changes to both national energy policies and current rules and regulations governing China's biofuels market.

A trial biodiesel program for transportation fuel started in Hainan in 2010, but the trial program was only applied to two counties due to inconsistent feedstock supplies (primarily waste cooking oil). There have been no new policies or incentives announced for the sector in recent years.

II. Policy and Programs

The biofuel policies and support programs are unchanged from the previous year. For more details please see GAIN report CH 13040.

China implemented fuel ethanol programs starting in the early 2000's in response to abundant grain supplies, but switched course in 2008 when increasing domestic grain prices triggered concerns over possible shortages. Since then government policy has dictated that biofuel development not compete with crops intended for human or animal consumption. This policy has spurred research in alternative crops, such as sweet sorghum and cassava, which can grow on marginal land. These crops are unable to support large-scale industrial ethanol production at this time.

There is currently only one cassava and one sweet sorghum plant producing fuel ethanol in China. The government reportedly approved an additional two plants in 2012 to be built in Zhejiang and Guangdong, but these plants would depend on imported cassava due to limited domestic supplies. It is unclear when, or whether, construction on these plants will begin.

The National Energy Administration (NEA), under China's National Development and Reform Commission, oversees the development of China's energy sector. For biofuels, NEA's main responsibility includes developing China's overall energy strategic plan, drafting general laws and regulations, contributing to industry regulations, technology regulations and standards, and providing guidance on science and technology research. Bioenergy is viewed as one of the nation's strategic emerging industries. China's 12th Five Year Plan (2011-2015) set goals for increasing biomass and biofuel production (see below) and promoted the development of cellulosic ethanol and algae-based biodiesel. However, the government is expected to fall well short of these targets due to limited feedstock supplies and a desire to maintain self-sufficiency in grains.

12th Five Year Plan Target for 2015

Biomass Electricity	Biomass Gas Annual Utilization	Solid Biomass for Fuel Annual Utilization	Liquid Biofuels Annual Utilization
13 million kilowatts capacity	30 billion cubic meters	10 mmt	5 mmt. (4 mmt of fuel ethanol and 1 mmt of biodiesel)

Ethanol

The government tightly controls grain ethanol production and has reduced financial support for its production. China's Ministry of Finance announced that by 2015 it will remove the Value Added Tax rebate of 17 percent and impose a five percent consumption tax for grain-based ethanol production. The mandatory blend rate for gasoline in designated markets remains unchanged at 10 percent. In practice, the blend rate ranges between 8-12 percent according to industry sources. Ethanol is not allowed to be blended into fuel outside the designated markets.

Construction of fuel ethanol plants is subject to approval from central or provincial governments. In provinces with a mandated blend for fuel ethanol, the provincial government issues regulations on the production and distribution of the fuel ethanol. By regulation, each of the 7 fuel ethanol plants has a designated distribution market in one or several provinces. As of 2014, the mandate blend program fully covers 6 provinces and covers another 30 cities in 5 other provinces. Regulations require state petroleum companies in these provinces to purchase and blend fuel ethanol from the designated plants.

Deteriorating air quality in China has become attracted widespread public attention and concern in recent years. The government is under pressure to improve air quality by measures such as reducing coal use, improving fuel quality for vehicles, and reducing industrial and construction related pollution. The transportation sector has been identified as a key pollution source in urban areas. The biofuel industry is advocating the use of ethanol to reduce emission pollutants. However, current ethanol production capacity is constrained by a lack of non-grain feed stocks and would have trouble servicing additional provinces or cities. Current regulations and policies tightly control the production, sale and distribution of ethanol, and do not allow for the use of imported ethanol.

Biodiesel

There continues to be no national or provincial mandate for biodiesel usage due to limited production. In 2010, China removed a five percent consumption tax to stimulate biodiesel production.

Calendar Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Gasoline Total	134,580	141,309	148,374	155,793	163,583	171,762	180,350	189,368	198,836	208,778
Diesel Total	237,632	249,513	261,989	275,088	288,842	303,285	318,449	334,371	351,090	368,644
On-road	150,246	157,758	165,646	173,928	182,625	191,756	201,344	211,411	221,981	233,080
Agriculture										
Construction/ mining										
Shipping/rail										
Industry										
Heating										
Jet Fuel Total										
Total Fuel Markets	372,212	390,822	410,363	430,881	452,425	475,047	498,799	523,739	549,926	577,422

Notes:

- 2015 gasoline and diesel total is estimated by Post. There are no available official estimates.
- The conversion rate for gasoline is 1,388 liters=1 Metric ton, conversion rate for diesel is 1,176 liters =1 Metric ton. These are the rates used by China's Customs and Taxation Bureau.
- The growth rate for gasoline and diesel between 2015 and 2024 is estimated at 5 percent annually. These growth estimates are in tandem with China's GDP growth rate, which was projected at around 7 percent annually during the 12th five year plan (2011-2015). Energy efficiency is expected to continue improving in the 13th five-year plan (2016-2020).

	2006	2007	2008	2009	2010	2011	2012
Diesel	7.9	5.6	8.3	1.7	6.4	6.8	8.5
Gasoline	8.0	5.3	11.3	0.4	11.6	8.8	10

Source: China Energy Statistical Yearbook

III. Ethanol

Fuel Ethanol Production

China's 2014 fuel ethanol production is estimated at 2.8 billion liters (2.20 million metric tons), up 6 percent from the previous year in response to increased fuel consumption in provinces with blend mandates. The mandated blend in designated provinces is 10 percent, while in practice the blend rate for ethanol in gasoline is between 8 and 12 percent. According to industry sources, the blending rate falls to eight percent if ethanol production is lower than expected.

China currently has 7 plants licensed for fuel ethanol production (using corn, wheat, cassava, sweet sorghum and corn cobs). Corn accounted for 76 percent of fuel ethanol production in 2014, and another 14 percent came from wheat. The government is encouraging development of non-food grain feed stocks, such as cassava and sweet sorghum. However, these crops still compete with food crops for land, and only one cassava and one sweet sorghum ethanol plant are approved for production by the government. Currently 8 percent of fuel ethanol is produced using cassava, and less than 1 percent is produced from sweet sorghum. An additional 1 percent of fuel ethanol production is cellulosic ethanol based on corn cobs. Fuel ethanol production accounted for less than one percent of China's liquid fuel production in 2014.

The 11th Five-Year Plan (2006-2010) set goals for expanding non-grain based ethanol production, targeting cassava and sweet sorghum. The world's first cassava ethanol plant was built in Guangxi in 2007 with an annual production capacity of 200,000 tons. A sweet sorghum ethanol plant (50,000 tons capacity) was completed in Inner Mongolia in 2012. In June 2014, the plant started to supply fuel to 3 cities in the province. Based on the fuel market size and the 10 percent blending rate for the three cities, the plant is expected to supply 20,000 tons of fuel ethanol annually by 2015 according to industry sources.

Year	Production Quantity	% Increase from Previous Year
2003	25.3 million liters (or 20,000 MT/year)	
2004	380.1 million liters (or 300,000 MT/year)	1400%
2005	1,165.6 million liters (or 920,000 MT/year)	206%
2006	1,647.1 million liters (or 1,300,000 MT/year)	41%
2007	1,736 million liters (or 1,370,000 MT/year)	5%
2008	2,002 million liters (or 1,580,000 MT/year)	13%
2009	2,179 million liters (or 1,720,000 MT/year)	8%
2010	2,128 million liters (or 1,680,000 MT/year)	-2%
2011	2,255 million liters (or 1,780,000 MT/year)	6%
2012	2,509 million liters (or 1,980,000 MT/year)	11%
2013	2,635 million liters (or 2,080,000 MT/year)	5%
2014	2,787 million liters (or 2,200,000 MT/year)	6%
2015	2,914 million liters (or 2,300,000 MT/year)	5%
Source: NEA and industry sources		

Overall Ethanol Production

2013 ethanol production is estimated at 7.85 billion liters (6.2 million metric tons). Ethanol used for beverages and hard liquor accounts for 35 percent, with ethanol for fuel and other industrial chemicals accounting for the other 65 percent, or 5.07 billion liters. While fuel ethanol production grew 5 percent in 2013, other industrial use of ethanol is estimated down 2 percent due to China's economic slowdown. Ethanol use for beverages and hard liquor is estimated to have declined 5 percent from the previous year due to the government's anti-corruption campaign that targeted banquets.

China has a reported 160 ethanol plants nationwide using a variety of feedstocks such as grains (corn and wheat), tubers (cassava and sweet potatoes), and molasses. Corn and cassava are the main feedstocks, accounting for 70 percent and 25 percent, respectively. Molasses (from cane or beet

sugar plants) accounts for the remaining five percent.

Ethanol Trade

There continues to be a five percent temporary import tariff on denatured ethanol (HS code: 220720) in 2014. This tariff has been lowered over the past few years (it was 30 percent in 2009) to encourage additional imports of by-products and raw materials. Imports of denatured ethanol are only allowed to be used in the chemical processing sector. The government tightly controls fuel distribution and does not currently allow imported denatured fuel ethanol to be used in the transportation sector.

In January 2014, Chinese media reported a shipment of U.S. denatured ethanol arrived in Zhenjiang port, Jiangsu province. The imports totaled 10,500 tons (13.3 million liters). According to trade contacts, the estimated cost for the fuel ethanol is RMB 7,318 per ton (including a 5 percent tariff rate, 17 percent VAT and 5 percent consumption tax). This import price is higher than the price for anhydrous ethanol in the domestic market (RMB 6,250 - 6,750 per ton in February 2014), but lower than the government set price for fuel ethanol. Under current regulations, only the 7 fuel state designated ethanol plants are allowed to sell fuel ethanol to state oil monopolies, such as Sinopec or PetroChina, at a fixed rate of 91.1 percent of the current gasoline price.

According to trade contacts, the ethanol imported in January 2014 was part of a trial to study the economics and trading channels for ethanol. The trial proved that imports are feasible and economically viable, but resulted in scrutiny from the government as current regulations prevent the use of imported ethanol in the transportation sector. Future imports will require changes to both national energy policies and current rules and regulations governing China's biofuels market. The government has been reluctant to change course despite the need for imported fuel and pressing air pollution challenges, citing a desire to protect domestic ethanol which is currently operating at only 40 percent capacity. High domestic corn prices and sluggish industrial and beverage demand for ethanol have hurt ethanol producers in China in recent years. Government officials also cite concerns over possible price and supply volatility as a reason not to utilize imported ethanol.

The tariff structure for ethanol is unchanged in 2014. For undenatured ethanol, the import tariff remains at 40 percent. There is a value added tax for imports of 17 percent, and a consumption tax of five percent for both denatured and undenatured ethanol. In 2012 China eliminated import tariffs for ethanol (undenatured and denatured), as well as biodiesel, from ten ASEAN countries plus Chile, Singapore, and Pakistan due to free trade agreements with these countries.

Tax and tariffs on ethanol and biodiesel

Tariff and Taxes on Ethanol Trade					
HS#		Import Tariff Rate	VAT on Import	Consumption Import Tax	VAT Rebate on Export
220710	Undenatured	40%	17%	5%	0%
220720	Denatured	5%*	17%	5%	0%
Tariff and Taxes on Biodiesel Trade					
HS#		Import Tariff Rate	VAT on Import	VAT Rebate on Export	
382600	Biodiesel and mixtures	6.5%	17%	0%	
For biodiesel from ASEAN countries, the Tariff rate is zero since 2012					

Source: Ministry of Finance

Table 3: Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Beginning Stocks	0	0	0	0	0	0	0	0	0	0
Fuel Begin Stocks	0	0	0	0	0	0	0	0	0	0
Production	3,801	3,923	4,082	3,953	4,333	4,700	4,900	5,000	5,120	5,250
Fuel Production	1,647	1,636	2,002	2,183	2,179	2,255	2,509	2,635	2,787	2,914
Imports	8	1	0	0	4	5	15	0	14	4
Fuel Imports	2	1	0	0	3	5	3	0	14	4
Exports	1018	130	108	108	156	43	45	40	28	25
Fuel Exports	47	19	8	16	12	8	7	2	1	2
Consumption										
Fuel Consumption	1,647	1,636	2,002	2,183	2,179	2,255	2,509	2,635	2,801	2,914
Ending Stocks										
Fuel Ending Stocks	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Refineries	4	4	4	5	5	5	6	6	7	7
Nameplate Capacity	1,824	1,824	2,065	2,243	2,500	2,500	2,600	2,700	2,800	3,000
Capacity Use (%)	90%	90%	97%	97%	87%	90%	97%	98%	100%	97%
Co-product Production (1,000 MT)										
DDGS	1,002	1,070	1,150	1,252	1,252	1,350	1,565	1,612	1,650	1,750
Corn Oil	50	56	65	70	71	81	88	95	100	105
Wheat Gluten	45	45	45	45	45	45	45	45	45	45
Bagasse (sweet sorghum)									13	51
Feedstock Use (1,000 MT)										
Corn kernel	3,200	3,420	3,600	3,920	3,900	4,250	4,900	5,060	5,310	5,600
Wheat kernel	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
Cassava (dried chips)			364	467	392	336	336	392	504	504
Corn Cob								240	250	260
Sweet Sorghum (fresh whole stalk)									90	360
Market Penetration (Million Liters)										
Fuel Ethanol	1,647	1,636	2,002	2,183	2,179	2,255	2,509	2,635	2,801	2,914
Gasoline	72,766	76,605	85,300	85,677	95,578	102,656	112,996	119,775	126,962	134,580
Blend Rate (%)	2.3%	2.1%	2.3%	2.5%	2.3%	2.2%	2.2%	2.2%	2.2%	2.2%

China Ethanol Exports								
Partner Country	Unit in 1,000 L	Quantity						Change in 2013 in %
		2008	2009	2010	2011	2012	2013	
World		108,110	107,895	156,019	43,333	44,962	39,776	-12%
Korea North		8,467	3,282	7,547	9,848	27,187	20,915	-23%
Taiwan		14,556	13,708	21,312	13,778	7,365	8,027	9%
Japan		12,560	11,362	14,743	15,276	8,529	5,101	-40%
Philippines		4,297	6,288	19,064	2,394	0	3,649	
India		571	885	906	872	964	984	2%
Korea South		34,933	58,534	85,460	0	0	41	
Australia		17,685	3,705	3,699	16	16	20	28%
Singapore		14,532	6,747	2,406	170	32	2	-92%
Others		510	3,387	883	979	868	1,036	19%
China Ethanol Imports								
Partner Country	Unit in 1,000 L	Quantity						Change in 2013 in %
		2008	2009	2010	2011	2012	2013	
World		402	159	3,611	5,305	15,308	275	-98%
Japan		131	109	153	184	229	142	-38%
United States		13	25	44	30	31	32	3%
Pakistan		194	0	0	1,973	7,854	18	-100%
Indonesia		0	0	3,004	2,943	0	0	-100%
Vietnam		0	0	0	0	4,995	0	-100%
Thailand		0	0	0	24	2,066	0	-100%
Others		64	25	411	151	133	83	-38%
Data Source: WTA								

IV. Biodiesel

2014 bio-diesel production is forecast to rise five percent to 1.13 billion liters (1 million metric tons). The rise in biodiesel imports in 2014 is lowering the profit margin for domestic producers and leading to slower production growth. Biodiesel production in 2013 is estimated to have increased 18 percent year-on-year due to the government crackdown on the illegal use of recycled cooking oil for human consumption. The crackdown contributed to a rise in additional feed stock supply for biodiesel producers. Most biodiesel production is based on waste cooking oil.

Biodiesel production capacity is estimated at 4 billion liters, unchanged from the previous year. The number of biodiesel plants stands unchanged at 53. The capacity utilization rate for the sector is estimated at only 28 percent, due in part to the lack of large scale collection of waste cooking oil. There is still a large market for waste cooking oil (also known as “gutter oil”) for illegal food use despite government efforts to crackdown on the practice. This creates competition for waste oil, making it more difficult for biodiesel facilities to obtain feedstock.

There is no official mandate for biodiesel use in transport fuel and biodiesel cannot be sold to state owned gas stations. A trial biodiesel program for transportation fuel started in Hainan in 2010, but the trial program was only applied to two counties due to inconsistent feedstock supplies (primarily waste cooking oil). Most biodiesel for road transportation is sold at private gas stations in small cities or the countryside. Biodiesel use for road transportation is estimated to account for 30 percent of overall production. An additional 50 percent is used in the industrial sector and 20 percent is used for agricultural machinery and fishing boats.

Overall diesel use for the transportation sector is estimated at 142 billion liters for 2014, up six percent from the previous year. Diesel for transportation accounts for 63 percent of total diesel use. Biodiesel production accounts for 0.2 percent of total diesel use. China is unlikely to start any mandated use of biodiesel for transport fuel in the near future given the limited scale of biodiesel production at this time.

Table 4 :Biodiesel (Million Liters)										
Calendar Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Beginning Stocks	0	0	0	0	0	0	0	0	0	0
Production	273	352	534	591	568	738	909	1,079	1,133	1,190
Imports	0	0	0	0	0	0	20	50	100	150
Exports	0	0	0	0	0	0	0	0	0	0
Consumption	273	352	534	591	568	738	929	1,129	1,233	1,340
Ending Stocks	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Biorefineries	65	96	84	62	45	49	52	53	53	54
Nameplate Capacity	1,761	3,124	3,351	2,670	2,556	3,400	3,600	4,000	4,000	4,250
Capacity Use (%)	15.5%	11.3%	15.9%	22.1%	22.2%	21.7%	25.3%	27.0%	28.3%	28.0%
Feedstock Use (1,000 MT)										
Used Cooking Oil	267	344	522	578	556	722	889	1,055	1,108	1,164
Feedstock B										
Feedstock C										
Feedstock D										
Market Penetration (Million Liters - specify unit)										
Biodiesel, on-road use	82	106	160	177	170	221	273	324	340	357
Diesel, on-road use	76,996	84,489	89,956	92,810	100,179	111,546	126,150	133,718	141,742	150,246
Blend Rate (%)	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Diesel, total use	139,193	146,932	159,136	161,771	172,096	183,868	199,520	211,491	224,181	237,632

Biodiesel imports exploded in 2013, growing over 700 percent to 159 million liters. The increase was caused by a fall in palm oil prices and the elimination in 2013 of China's 0.8 RMB/liter consumption tax on biodiesel imports. In 2012 China eliminated import tariffs for ethanol and biodiesel from ten ASEAN countries plus Chile, Singapore, and Pakistan due to free trade agreements with these countries. The vast majority of biodiesel imports have come from Indonesia, and this trend is expected to continue in 2014.

Imports of petroleum oil containing up to 30 percent biodiesel (HS code of 271020) surged in 2013

as a result of the elimination of the consumption tax for biodiesel. Trade contacts reported that most imports under this tariff line had very low biodiesel content (around 1-2 percent) and that this was added in order to avoid consumption taxes. The government cracked down on this practice in 2014, and imports under this tariff line have fallen as a result. Post's biodiesel tables do not include imports under this tariff line due to their low level of biodiesel content.

China exported 85,000 liters of biodiesel in 2013. The biodiesel was reportedly processed from gutter oil by a manufacturer in Shandong province and used for jet fuel by the importing country.

China Biodiesel Imports in 1,000 Liters (HS code: 3826)							
		2009	2010	2011	2012	2013	2012-13 percent change
World	World	0	0	0	19,691	159,288	709%
Indonesia	Indonesia	0	0	0	19,674	156,437	695%
Malaysia	Malaysia	0	0	0	0	1,667	
Singapore	Singapore	0	0	0	0	1,138	
Others	Others	0	0	0	0	45	
China Biodiesel Exports in 1,000 Liters (HS code: 3826)							
		2009	2010	2011	2012	2013	
World	World	0	0	0	66	85	29%
Netherlands	Netherlands	0	0	0	0	70	

Commodity: 271020, Petroleum Oils And Preparations Containing Biodiesel, Containing By Weight Gt=70% Petroleum Oils Or Oils Of Bituminous Minerals, Other Than Waste Oils				
Partner Country	Unit			
		2011	2012	2013
World	In 1,000 Liters	0	114,914	2,872,747
Malaysia	T	0	0	1,410,414
Thailand	T	0	0	857,089
Indonesia	T	0	80,578	371,137
Singapore	T	0	34,287	233,949
Others			0	158

Vehicle and Fuel Use

The number of civilian vehicles in China reached 126.7 million units in 2013, up 15.8 percent year-on-year, according to China National Statistical Yearbook data. Passenger vehicles in 2013 reached 105.62 million units, up 18 percent year-on-year. The China Auto industry Association forecasts that vehicle sales in 2014 will grow at a rate of 8-10 percent as the economy expands and vehicles becomes more affordable for Chinese households. Sales of civilian vehicles (passenger vehicles, trucks, and "other") reached 11.68 million units during the first half of 2014, up 8.4 percent year-on-year. Truck sales have been hurt by the economic slowdown, while passenger vehicle sales continue to show strong growth.

China Vehicle Sales in 2013 (million units)		
	Sales	Growth Rate
Total Vehicles	21.98	13.9%
Passenger Vehicles	17.93	15.7%
(Sedans)	12	11.8%
Source: China Auto Industry Association		

The government encourages the purchase of electric vehicles and other “new energy” vehicles to reduce fossil fuel use and improve air quality. The State Council announced in July, 2014, that the purchase tax (10 percent or more) for new energy vehicles will be removed to promote their use. The State Council also announced that month that at least 30 percent of new vehicles purchase by the central government, and certain select municipal governments and institutions, must be new energy vehicles. New energy vehicles must account for 15 percent of purchases in 2014 in Beijing, Tianjin, Hebei, Yangtze River Delta (Shanghai region) and Pearl River Delta (Guangzhou region) as part of a campaign to tackle heavy air pollution in these regions. For all other government agencies and institutions, new energy vehicles must account for at least 10 percent of new vehicle purchases in 2014. This requirement increases to 20 and 30 percent respectively in 2015 and 2016.

Total diesel consumption in 2013 is estimated at 211,491 million liters, while gasoline consumption is estimated at 119,775 million liters. Post forecasts that gasoline and diesel consumption will increase by six percent in 2014 due to steady, but slower, economic growth. There are no official growth projections for fuel use.

V. Advanced Biofuels

Cellulosic ethanol production is forecast to reach 42 million liters (33,000 tons) in 2014, up 3 percent from the previous year. China’s only commercial cellulosic ethanol plant has an annual capacity for 63.4 million liters (50,000 tons), and uses corn cobs. The plant has supplied ethanol for seven cities in Shandong province since October 2012. Other ethanol plants are reportedly preparing to build demonstration-scale cellulosic ethanol projects using a variety of feedstocks, such as corn stover and wheat straw. Planned production capacity exceeds 10,000 tons per plant. It is unclear when these demonstration projects will be completed.

VII. Notes on Statistical Tables

Table 1: China Fuel Use Projection

- There is no public official data for annual fuel-use. Post forecasts that gasoline and diesel consumption will grow at an annual rate of 5 percent from 2016-2023.
- The conversion rate for gasoline is 1388 liters per metric ton. The conversion rate for diesel is 1176 liters per metric ton. These are the conversion rates used by China Customs and Chinese Taxation Bureau on sales tax for gas stations.

Table 3: Fuel Ethanol

- The corn and wheat to ethanol conversion ratio is 3.2 to 1; the cassava (dried) to ethanol

conversion ratio is 2.8 to 1.

- Categories for production, by-products, and feedstock use refer to the 7 fuel ethanol plants.
- For the plant that uses corn cobs for cellulosic ethanol, the conversion rate for corn cob (14 percent moisture level) to ethanol is 7.5 to 1. The plant started operation in October 2012.
- For the sweet sorghum plant that started operation in June 2014, the conversion rate for sweet sorghum (fresh stalks) to ethanol is 18 to 1. This is the first such plant in China.

Table 4: Biodiesel

- Nearly 30 percent of biodiesel is for on-road transportation, the rest is for shipping and agricultural machinery and other chemical sectors.
- For biodiesel, the conversion rate for used cooking oil to biodiesel is 1 to 0.9. Most of the feedstock in China is collected and processed from gutter oil.
- The blend rate for biodiesel can reach as high as 20 percent. The higher the blending rate, the higher the profit for gas stations. Hainan's trial program has a blending rate of only 2-5 percent.