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## Korea, Republic of

### Bio-Fuels

### Bio-Fuels Production Report

### 2007

**Approved by:**

Lloyd S. Harbert  
U.S. Embassy

**Prepared by:**

Michael Francom/ Sun Young Choi

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**Report Highlights:**

The Korean government has introduced measures to increase biodiesel production and consumption in an effort to improve the country's air quality. Biodiesel-100 production for CY 2007 is estimated at 79,200 MT. The oil industry is currently blending BD-100 with petroleum diesel at a ratio of 0.5 percent. Korea has also begun exploring options to produce biodiesel feedstocks domestically.

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Includes PSD Changes: No  
Includes Trade Matrix: No  
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## Section I. Executive Summary

One-third of the 15.8 million registered vehicles in Korea run on diesel. Although there are fewer diesel powered vehicles, diesel consumption is almost twice as large as gasoline consumption. The reason behind this difference in consumption is that larger, less fuel-efficient vehicles are using diesel.

Diesel emissions are considered the primary contributing factor to Korea's air pollution problem. In an effort to improve the country's air quality, the Ministry of Commerce, Industry and Energy (MOCIE) has introduced measures to increase biodiesel production and consumption. Meanwhile, the Ministry of Agriculture and Forestry (MAF) has begun exploring options to produce biodiesel feedstocks domestically.

### Fuel Consumption of Korean Automobile Industry (As of December 2006)

Engine Type	Number of Registered Vehicles	Share (%)	Fuel Consumption (Kiloliter)	Share (%)
Gasoline	7,915,877	50%	9,125,522	26.8%
Diesel	5,869,455	37%	17,818,619	52.3%
LPG 1/	2,047,402	13%	7,101,250	20.9%
Total	15,832,734	100%	34,045,391	100%

Source: Korea Automobile Manufacturers Association (KAMA), Korea National Oil Corporation (KNOC)  
1/ LPG is an abbreviation for liquefied petroleum gas

## Section II. Production and Trade

### Biodiesel Production

There are currently 15 BD-100 producers, nearly twice as many as last year, with a combined production capacity of 531,520 MT. BD producers are not operating at full capacity in part due to a blending agreement brokered between the domestic oil industry and MOCIE.

Under the agreement, five MOCIE-authorized oil refiners agreed to blend 158,400 MT of BD-100 with petroleum diesel over a two-year period beginning in July 2006. Annual biodiesel production and consumption estimates are roughly equivalent to the volume of BD-100 that the oil industry has agreed to blend with petroleum diesel.<sup>1</sup> With that in mind, BD-100 production and consumption for 2006 is 40,304 MT. Meanwhile, BD-100 production and consumption for 2007 is estimated at 79,200 MT.

MOCIE initially set the blend ratio at 5 percent (BD-5). However, the local oil and auto industries complained that the 5 percent blend ratio was too high. The oil industry was worried about decreased sales of petroleum diesel, while the auto industry was concerned about the quality of the mixed fuel.

MOCIE acquiesced to these complaints and reduced the blend ratio to 0.5 percent (BD-0.5). The Ministry of Environment (MOE) and environmentally conscious NGO's criticized MOCIE for yielding to industry pressure.

Nearly all BD-100 production is sold directly to one of the five MOCIE-authorized oil refineries where it is added to regular diesel. The blended fuel is distributed to gas stations across Korea for sale to consumers. At the pump, there is no distinction between sales of standard

<sup>1</sup> BD-100 production and consumption estimates exclude a negligible amount of BD that is sold directly to government filling stations for on-site blending to produce BD-20.

diesel and BD-0.5. The remaining supply of BD-100 is sold directly to government owned filling stations where mixing is done on site.

### Korea's Biodiesel Producers Registered in the MOCIE and Their Production Capacities (Unit: Metric tons)

Company Name	Production Capacity (MT)	Feedstock Use
KAYA Energy Co., Ltd.	88,000	Soybean Oil & Recycled Frying Oil
Dansuk Industrial Co., Ltd.	52,800	Soybean Oil
BND Energy	44,000	Soybean Oil & Recycled Frying Oil
Ecoenertech	29,040	Recycled Frying Oil
BDK	17,600	Soybean Oil & Recycled Frying Oil
3M Safety	42,240	Soybean Oil
CNG	7,920	Recycled Frying Oil
Moodeung Bioenergy	5,280	Recycled Frying Oil
Bio Alternative Energy	7,920	Soybean Oil
Samwoo Oil Chemical Co., Ltd.	10,560	Recycled Frying Oil
Next Oil	87,120	Soybean Oil
Enertech Inc.	70,400	Palm Oil & Soybean Oil
Bio Doil Korea	10,560	Soybean Oil & Recycled Frying Oil
SK Chemicals	29,920	Palm Oil
Aekyung Petrochemical Co., Ltd.	28,160	Soybean Oil
<b>TOTAL</b>	<b>531,520</b>	

Source: Ministry of Commerce, Industry and Energy (MOCIE) & Biodiesel Industry

### Biodiesel Consumption/Production (Metric tons)

	2002	2003	2004	2005	2006	2007
Diesel Consumption	13.7 million	14.7 million	14.8 million	14.8 million	14.9 million	14.9 million
BD-100 Consumption/Production	1,397	3,304	6,015	13,669	40,304	79,200 1/
Percentage of Biodiesel Consumption	0.01%	0.02%	0.04%	0.09%	0.27%	0.53%

Source: Ministry of Commerce, Industry and Energy (MOCIE)

1/ CY2007 consumption/production estimate is based on oil industry sources; excludes negligible amount of BD used to produce BD-20.

### BD-20

Between 2002 and 2005, small volumes of BD-100 were supplied to select public gas stations where it was blended to produce BD-20. However, direct sales of BD-100 to public stations were discontinued after the implementation of the Petroleum Business Act (PBA) in 2006.

Under the PBA, only company-owned or government filling stations are permitted to blend BD-20. While BD-20 is not currently used commercially, it is used to fuel approximately 600 government-owned vehicles, most of which are trash trucks. Greater use of BD-20 is limited due to the continued availability of diesel tax credits.

### Prices

Diesel prices are high due to taxes, including a traffic tax, mileage tax, education tax and value added tax (VAT). According to the Korea National Oil Corporation (KNOC), taxes on standard diesel fuel account for about 50 percent of the total price at the pump.

Although BD is exempt from the abovementioned taxes, with the exception of the VAT, the price at the pump is the same as standard diesel for two reasons. First, the tax exemption only applies to the proportion of BD, which currently is very small at 0.5 percent (blend ratio). Second, the BD factory price is 300 Korean won more expensive than petroleum diesel.

BD tax exemptions are set to expire in the near future. However, MOCIE is expected to extend the exemption for the next a couple of years.

### Price Comparison between Diesel and Biodiesel (Unit: Korean Won / Liter)

	2004	2005	2006	2007
Factory price (diesel)	400	560	560	605
Tax (diesel)	340	410	560	605
Tax-added price (diesel)	740	970	1,120	1,210
Biodiesel factory price	N/A	900-950	900-950	900-950

Source: Korea National Oil Corporation (KNOC) and Biodiesel Industry

### Bioethanol

In 2006, the Korean government initiated a two yearlong study to determine the feasibility of using bioethanol as transportation fuel. The budget for this project is estimated at 2.6 billion Korean won (US\$ 2.75 million).

### Feedstocks

Korea imports nearly all of its feedstocks used in BD production. BD is produced from 70-80 percent soybean oil and 20-30 percent recycled cooking oil. Due to rising soybean oil prices, BD producers are considering alternative less expensive feedstocks, such as palm and jatropha oils. Although several BD producers have the capability of using palm oil, they are not currently using it as a feedstock.

Soybean oil is imported mainly from Argentina (86 percent) and the United States (14 percent) in 2006. The domestic soybean oil industry estimates that of the 260,000 tons of soy oil imported in 2006, approximately 50,000 – 60,000 MT was used for biodiesel production. The forecast for 2007 is expected to double to 110,000 – 120,000 MT to meet the projected annual supply quantity under (79,200 MT) the voluntary supply agreement.

Given its heavy dependence on imported feedstocks, Korea has been exploring options to produce biofuel feedstocks domestically. MAF recently announced plans to invest 2.6 billion won (US\$ 2.75 million) in a pilot project to introduce three new 500-hectare rapeseed farms by 2009. These farms are expected to produce 2,112 MT (2,400 kl) of rapeseed oil each year.