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## Korea - Republic of

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### Bio-Fuels Production

#### Report Categories:

Bio-Fuels

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#### Report Highlights:

Increased biofuel use will play an important role in Korea's goal of cutting green house gas emissions over the next decade. As part of this larger agenda, Korea is contemplating revisions to its biodiesel blend rates, tax credits, feedstock sources, and renewable fuel standards. The blend rate is expected to continue its upward climb in the coming years, indicating strong future demand for imported feedstock, such as soy and palm oil. Korea is considering approving animal fat as a possible feedstock, which has already resulted in increased interest in U.S. rendered products.

## **General Information:**

### **Situation and Outlook**

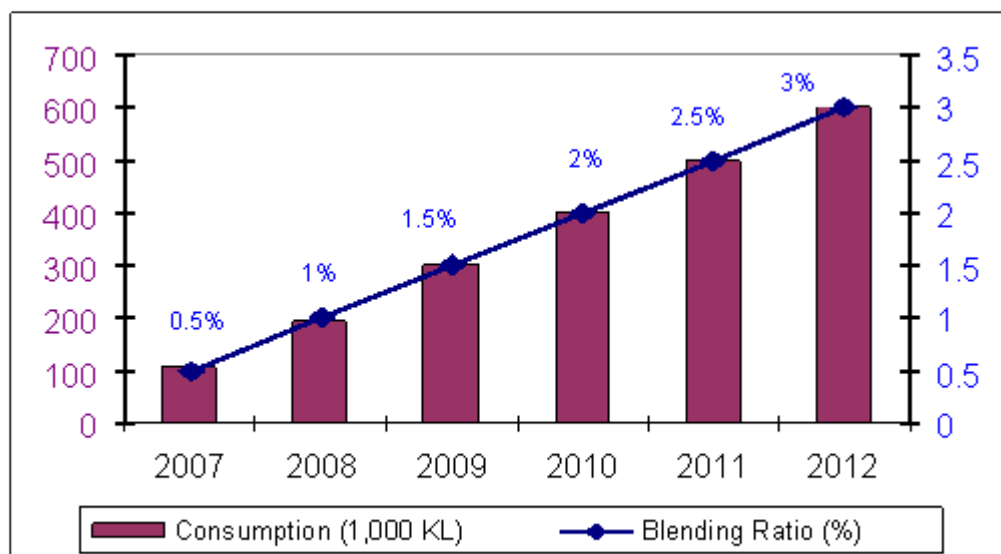
Shortly before the Copenhagen Climate Change Conference last December, the Presidential Committee for Green Growth announced an ambitious plan to cut the country's green house gas emissions by 4 percent by 2020 compared to 2005 levels. This would translate into a 30 percent reduction to the country's expected carbon dioxide levels in 2020. The increased use of biofuel in the transportation sector is expected to play a key role in carrying out this plan.

As a part of this broader plan, the Ministry of Knowledge and Economy (MKE) will convene an interministerial meeting during the first half of this year to discuss revisions to the country's Biodiesel Supply Plan (BSP). The discussions will focus on revising the target biodiesel blend ratios, industry tax breaks, biodiesel feedstock sources and the development of renewable fuel standards (RFS). The agreed-upon revisions to the BSP will become effective starting in 2011.

A decision to raise the current targeted biodiesel blend rates for 2011 (2.5%), 2012 (3%) and beyond is expected at this upcoming interministerial meeting. Although it is uncertain what the final targets will be, there is more than sufficient production capacity to double the current blend ratio to 4 percent. The blend ratio is currently set at 2%, up half of a percentage point from last year.

The Ministry for Food, Agriculture Forestry Fisheries (MFAFF) is conducting research projects to develop locally produced feed stocks such as rapeseed, seaweed and livestock manure in order to diversify its feedstock portfolio. However, demand for imported feed stock is expected to remain strong for the foreseeable future.

Korea's Biodiesel Supply & Blending Ratio by Year



Source: Ministry of Knowledge & Economy

Note: Biodiesel Supply & Blending Ratio for 2011 & 2012 will be revised in 2010

## Biodiesel Production

The biodiesel industry estimates current production capacity at 800,000 kiloliters. However, actual production was only 300,000 kiloliters in 2009. In the future, this extra capacity is expected to come on line as the country gradually raises its biodiesel blend ratio.

One reason behind the current overcapacity is the recent surge in the number of local biodiesel producers. Over the last two years, the number of registered biodiesel producers has doubled to twenty-two. However, only nine currently have contracts with the local oil refineries, which are the only authorized agents to blend the biodiesel with conventional diesel fuel.

Local biodiesel producers, especially those without blending contracts, are exploring export opportunities in order to diversify their operations. The most notable example last year of looking for outside opportunities was SK Chemical's contract with Trafigura to supply 60,000 tons of biodiesel in 2010.

Biodiesel blended with petroleum was first introduced in mid-2006 at a handful of locations. However, the use of biodiesel blend has since expanded and the product is currently available at most filling stations across the country. The most commonly produced biodiesel blend is BD-5,

which despite its name currently only contains 2 percent biodiesel. Smaller amounts of BD-20 are also produced, but the distribution is limited to commercial vehicles such as busses and trucks.

#### Biodiesel Supply by Year (Kiloliters, Kl)

Year	2006	2007	2008	2009	2010
BD 100	46,000	108,000	195,000	300,000	400,000
BD 20	20	187	304		

Source: The Ministry of Knowledge & Economy (MKE)

Note: Total petroleum diesel consumption was estimated at 20 million kiloliters in 2009.

## Feedstock Production & Supply

Korea used approximately 300,000 kiloliters of biodiesel feedstock in 2009. Of that total amount, 75-80 percent was imported soy and palm oil, while the remainder was mainly domestic recycled cooking oil. The soybean oil is sourced main out of Argentina and Brazil, while the palm oil is primarily brought in from Malaysia and Indonesia.

The demand for imported feedstock – soy and palm oil – is expected to remain strong for the foreseeable future as Korea is expected to continue raising its biodiesel blend ratio each year. However, opportunities for U.S. soybean oil will likely remain limited since South American oil is more price competitive.

The future demand for recycled cooking oil as a feedstock will depend to a certain extent on the availability of domestic supplies, which are currently hampered in part due to an inefficient collection system. According to a local industry source, there is about 80,000 tons of used cooking oil that is currently not being recycled.

Korea is also exploring alternative biodiesel feedstock options such as animal fat and rapeseed. In fact, MKE is considering approving the use of animal fat waste and a decision is expected in the first half of this year, which, if positive, would boost demand for U.S. rendered products. In anticipation of this decision, the local biodiesel producers have already started reaching out to the U.S. rendering industry.

Meanwhile, MIFAFF will wrap up a 3-year long pilot rapeseed farming project this June. The plan was to produce 4,500 tons of rapeseed annually on 1,500 hectares. However, production has been far lower than expected because of poor yields and fewer hectares planted than expected since some

farmers decided to plant other more profitable winter crops, such as barley. The 2009 rapeseed crop, which will be harvested this coming spring, is forecast at 700-800 tons.

MIFAFF plans to review the outcome of this pilot program and will decide whether to expand it in the future. However, based on the results so far, it seems clear that developing a viable domestic biodiesel feedstock will be a significant challenge.

#### Korea's Rapeseed Area for Biodiesel Feedstock

	2007	2008	2009
Projected Area (Ha)	1,500 Ha	1,500 Ha	1,500 Ha
Cultivated Area (Ha)	794 Ha	965 Ha	820 Ha
Production (MT)	725 tons	860 tons	700-800 tons a/

Source: Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF)

Note: a/ 2009 crop will be harvested in May 2010

MIFAFF is also conducting a pilot program this year to turn livestock manure, mainly swine waste, into bio-energy. The goal of the program is to establish 150 different facilities with an annual processing capacity of 5.5 million tons of swine manure by the year 2020. This program, if successful, will provide an environmentally sustainable option to recycle the waste instead of dumping it in the ocean. Of note, Korea will prohibit the discharge of livestock manure in the ocean starting in 2012.

## Bio-Ethanol

In late 2008, MKE completed a several year long feasibility study regarding the commercialization of bio-ethanol in automobiles. The study concluded that the introduction of E3 or E5 would be possible with a few infrastructural and logistical adjustments. The study also showed 300,000 kiloliters of bio-ethanol would be required to successfully introduce E3 into the market.

In September 2009, after several months of discussion with the relevant stakeholders, MKE finalized standards for bio-ethanol used in the transportation industry. With these standards in place, MKE had planned to start a pilot program to introduce E3 at several filling stations last year, but has decided to delay moving forward since grain prices are still relatively high compared to the price of oil.

Meanwhile MIFAFF announced plans last March to spend US\$ 270.5 million over the next decade in order to develop seaweed into a potential feedstock for bio-ethanol. The goal of the plan is to produce an estimated 12.5 million tons of seaweed on 35,000 hectares by the year 2020.