USDA Foreign Agricultural Service
GAIN Report
Global Agriculture Information Network
Template Version 2.09

Required Report - public distribution

Date: 6/5/2008

GAIN Report Number: JA8038

Japan

Bio-Fuels

Bio-Fuels Annual Report

2008

Approved by:
Deanna Ayala
U.S. Embassy

Prepared by:
Midori Iijima, Suguru Sato, Hisao Fukuda

Report Highlights:
Government and private sector research and investment in biofuels have been on the rise since Japan's first biomass plan, "Biomass Nippon Strategy," was unveiled in December 2002. That Strategy was updated in 2008, and the GOJ's current thinking, given limited agricultural resources, is to focus very determinedly on cellulosic biofuel as the future for Japan's biofuel production. Ethanol production for fuel in 2007 was 1,430 kl, biodiesel production was roughly 5 mt and ETBE imports were roughly 6,700 kl.

Includes PSD Changes: No
Includes Trade Matrix: No
Annual Report
Tokyo [JA1]
[JA]

Table of Contents

Executive Summary

Government and private sector research and investment in biofuels have been on the rise since Japan's first biomass plan, "Biomass Nippon Strategy," was unveiled in December 2002. That Strategy was updated in 2008, and the GOJ's current thinking, given limited agricultural resources, is to focus very determinedly on cellulosic biofuel as the future for Japan's biofuel production.

During the past year, as food prices have increased and food insecurity in Japan and around the world captured headlines, biofuels have been under increasing criticism by Japanese lawmakers and media, often bearing the blame for those higher prices. Indeed, it was precisely this connection that led the Government of Japan (GOJ) to propose that rising food prices and food security be added to the G-8 Summit agenda for later this year.

Despite the slight backlash, the GOJ and private sector continue to pursue biofuels production through conventional and cellulosic means. Indeed, since Japan's greenhouse gas emissions in fiscal year 2006 increased by 6.4% from the 1990 level the GOJ is under pressure to turn that around in order to meet Kyoto Protocol commitments. However, given Japan's limited agricultural production it will be very difficult for Japan to produce enough biofuels to impact the domestic fuel market and thereby greenhouse gas emissions without a major technological breakthrough, e.g. cellulosic technology.

BIO-FUELS POLICY

Ministries Involved in the Bio-fuels Policy

Several ministries collaborate on Japan's bio-fuels policy: The Ministry of Economy, Trade and Industry (METI), and the Ministry of Agriculture Forestry and Fisheries (MAFF), the Ministry of Environment (MOE), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Land, Infrastructure and Transport (MLIT), and the Ministry of Internal Affairs and Communications (MIC). Substantial discussions and coordination among the ministries are done in the Executive Committee on Biomass Nippon Strategy, which is formed by director-general level officials of the ministries concerned. MOE's main concern is meeting Kyoto Protocol commitments, preventing global warming, and expanding the conversion of waste products into energy. METI collaborates with industry and is interested in analyzing the cost-benefit of shifting to renewable fuels and their impact on automobiles and infrastructure and is thus involved heavily in feasibility studies. While MAFF is interested in utilizing existing biomass (sugarcane, woody materials, rice, and rice straws and husks, etc.) in the production of energy the focus has shifted toward cellulosic methods and away from increasing production of biomass, per se. The New Energy and Industrial Technology Development Organization (NEDO) is overseen by METI and manages R&D project planning and development and post-project technology evaluation functions on a wide range of topics. NEDO is managing several of the biomass studies ongoing in Japan.

Policy Overview

Japan's first biofuel plan, "Biomass Nippon Strategy," was unveiled in December 2002 with four pillars: 1) Preventing global warming; 2) Formulating a recycling society; 3) Nurturing strategic industry, and 4) Revitalizing rural communities. When the Kyoto protocol was ratified in February 2005, Japan felt compelled to shift to high gear in promoting biofuels to meet its commitment to reduce CO_2 emissions by 6 percent from the 1990 level by 2010. Accordingly, in March 2006, Japan revised the Biomass Nippon Strategy to emphasize promoting the use of biofuels for transportation. It set a goal to replace fossil fuels with

500,000 kl (oil basis) of biofuels for the transportation sector by 2010. In February 2007, the Executive Committee on Biomass Nippon Strategy released a report titled "Boosting the Production of Biofuels in Japan." The report presented to the Prime Minister states that Japan will be able to produce 6 million kl of biofuels domestically by around 2030 if appropriate technical development is achieved. It sets a target to produce 50,000 kl of biofuels from molasses and off-spec rice by 2011 and 6 million kl (estimation by MAFF) of biofuels per year, 10% of domestic fuel consumption, from cellulosic materials such as rice straw, tinned wood and resource crops by around 2030. The ambitious target is based on the estimation that Japan has unused biomass resources (non-edible portions of farm crops and forestry residues) equivalent to 14 million kl of oil and that it could produce resource crops equivalent to 6.2 million kl of oil by fully utilizing the abandoned arable land, which is estimated at 386,000 ha. MAFF's aim is not shared by all Ministries, but MAFF is optimistic that by putting all its efforts and considerable financial backing into cellulosic research and development that they can meet this goal.

Government Incentives and Import Regimes

In 2008 the GOJ intends to introduce tax incentives to encourage the use of bioethanol. If a fuel contains 3 percent bioethanol, the gas tax will be lowered by ¥1.6 per liter. This tax measure has a set time frame being effective until March 31, 2013. In order to guarantee bio-gasoline quality, the GOJ implements a registration system for bio-gasoline blenders. These two measures are included in the amendment of the gasoline quality control law, which is now being reviewed in the Diet.

On May 21, 2008 the Diet approved unanimously a bill to promote using biomass resources to produce biofuels. The bill includes tax breaks and financial assistance for biofuel manufacturers and farmers producing feedstock, such as agricultural cooperatives and private businesses. The government encourages collaboration of those two groups, and their plans will be monitored by MAFF in order to qualify for the benefits. Under the scheme, for example, the fixed property tax for newly built biofuel facilities will be reduced in half.

In addition, the import tariff on ETBE (3 yen/liter) is to be removed

Bio-diesel Policy

With respect to bio-diesel, the GOJ decided that the blending ratio of Fatty Acid Methyl Ester (FAME) into light oil should be less than 5 percent, in order to ensure that the fuel meets safety and gas emissions standards for existing vehicles in the market. This new requirement was added in the Light Oil Standard under the Quality Control Law and became effective in March 2007. In Japan, because 100 percent bio-diesel fuel (B100) is not subject to the light oil transaction tax, many regional governments have initiated measures to use competitive B100 for their official vehicles, such as garbage trucks. However some have pointed out that problems may occur because automobiles distributed in Japan are not designed to use B100.

BIOFUEL MARKET CONDITION

Japan's Motor Vehicles Petroleum Based Energy Market

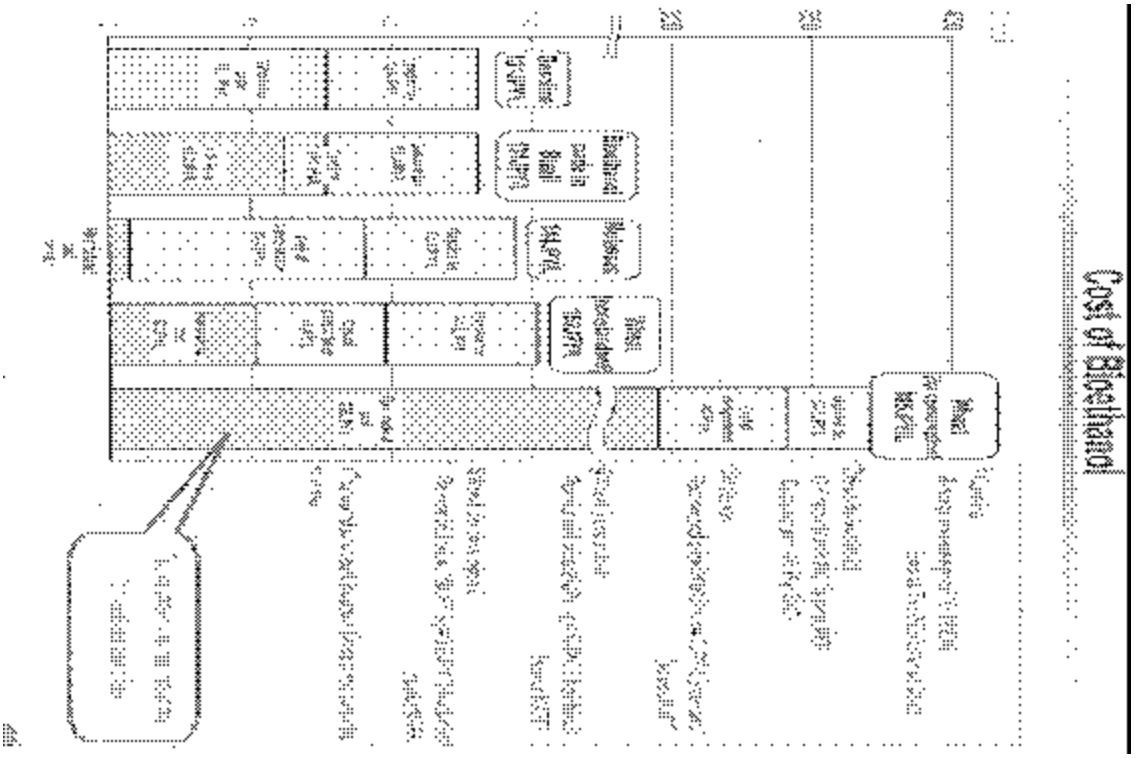
According to the Japan Automobile Manufactures Association (JAMA), there are 74 million automobiles in Japan (gas and diesel) and domestic fuel consumption is around 60 million kl

per year for gasoline and 36 million kl per year for diesel. If a three percent ethanol blend gasoline (E3) were nationalized, it is estimated that demand for ethanol would be around 1.8 million kl. In the case of 10 percent ethanol blend gasoline (E10), demand would be 6 million kl per year.

Japan's Gasoline Market

The Japanese gasoline market is made up of large companies. There are no independent dealers. Only a handful of companies import oil and/or gasoline. These roughly ten companies are organized into four groups, and they sell to their own contacts through a formalized distribution system. The companies form the Petroleum Association of Japan (PAJ). In April 2007, PAJ imported 7,500 kl of ETBE from France and mixed it with gasoline at a refinery in Yokohama to make a 7 percent ETBE blend. From April 27, 2007 PAJ started to sell bio-gasoline as an alternative to regular fuel for the first time on a commercial basis at 50 gasoline stations in the greater Tokyo area. It will double the number in 2008. This April, it imported approximately 6,700 kl of ETBE from Brazil; where the price is reportedly 20-30% lower than its competitor in Europe. PAJ aims at expanding the sales nationwide to 210 thousand kl by 2010. METI is subsidizing a project to test market fuel derived from biomass. Bio-gasoline is currently sold at the same price as that of regular gasoline though the production cost is higher. The difference is borne by the GOJ and the industry. The current government support is planned to last another year. A plan for succeeding years has not yet been decided.

Figure 1 Production Cost of Bioethanol



Source: MAFF

Debate on Direct Blending or ETBE

There are two methods for blending bio-ethanol with gasoline, "direct blending" and "ETBE." In Japan, MOE promotes direct blending while METI supports the ETBE method. The reason for the latter is that it is more costly for oil distributors to renovate the facilities for direct blending. One report estimates the cost to replace or upgrade existing infrastructure would be Y300-500 billion ($3-5 billion). MAFF has favored promoting direct blending. However, it is yielding to support the ETBE method in order to secure the distribution channel for domestically produced bio-ethanol. Hokuren, the federation of agricultural cooperatives in Hokkaido, plans to sell the bio-ethanol they produce to PAJ for blending with ETBE.

Japan's Ethanol Blend Limit

Japan's ethanol blend limit remains low by U.S. standards at 3 percent. A number of potential hazards have been raised, including automobile part corrosion. However, there are feasibility studies looking at the potential for introducing a 10 percent blend in the future. Japanese automakers have started to introduce some new models that can run on E10. Reportedly, Toyota Motor Corp. has agreed to supply two vehicles to the Ministry of Transportation for use in road testing an E10 ethanol blend in Osaka prefecture. Nissan Motor Co. has received approval from the GOJ for an E10 version of its Murano.

The GOJ has a rigorous testing and monitoring scheme to measure the effects of E3 on vehicles and the environment and how best to introduce ethanol to the market. In 2004 and 2005, METI commissioned the Japan Petroleum Energy Center to conduct experimental studies on the prospects for buying or producing, distributing and using ethanol-blended fuel. The ethanol is refined in Yokohama and distributed to service stations in: Akita, Chiba, Toyama, Mie, Osaka and Fukuoka Prefectures.

E3 usage is still quite limited in Japan. For example, in Osaka one can easily count the number of cars that are registered to use E3 gasoline: 576. Only six gasoline stations in the Osaka and nearby Hyogo prefectures sell E3 gasoline. This is a project supported by MOE who promotes the direct blending method. Meanwhile, PAJ will soon start selling bio-gasoline (regular gasoline blended with bio-ETBE) in those areas. Two different types of biofuels will actually compete in the market.

DOMESTIC PRODUCTION OF BIOFUELS

Ethanol Production

The initial thrust of Japan's biofuels movement focused on traditional production techniques, analogous to those used in the United States and other producing countries. MAFF has joint partnerships with local agricultural cooperatives, alcohol and trading companies to operate several model plants. MOE, METI and others also have a number of projects in the works. Following is a description of a select few of the model plants and facilities in Japan.

Utilizing MAFF's subsidies, which pay for up to 50 percent of the cost of building plants, two major facilities are being built in Hokkaido, Japan's agricultural heartland, for launch in April 2009: One is in Tomakomai and will be using rice; and the other is in Shimizucho and intends to use off-spec wheat and sugar beets. The project in Shimuzucho is a public-private partnership between Mitsubishi Corp. and Hokuren, the federation of agricultural cooperatives in Hokkaido. These are expected to become the first commercially-viable

ethanol plants in Japan with a planned annual production of 15,000 KL each. That ethanol will be used to produce ETBE. In order to produce 15,000 KL of ethanol, approximately 33,000 MT of rice, 35,000 MT of wheat or 150,000 MT of sugar beets are needed. A third facility in Obihiro City, Hokkaido is run by the Tokachi Foundation and is supported by prefectural and national funds. The Foundation runs a very small still that converts Hokkaido-grown wheat into ethanol to fuel a single test vehicle. The equipment is all state of the art, expensive, and on a miniature scale. The Foundation says that this is a 'proof of concept' project intended simply to see whether they could produce ethanol from wheat to fuel the vehicle.

There is one model plant in Niigata that is a joint operation with Zen-noh. It uses high yield rice grown specifically for biofuel production (800 kg/1000 m2 vs 500 kg/m2 for food use rice). The project began in 2006 using fallow land set aside in MAFF's acreage reduction plan. The facility should begin to produce 1000 kl of bioethanol in 2009 requiring about 2,250 tons of rice. This will be used as part of an E3 blend to be sold at 20 affiliated gas stations around Niigata prefecture.

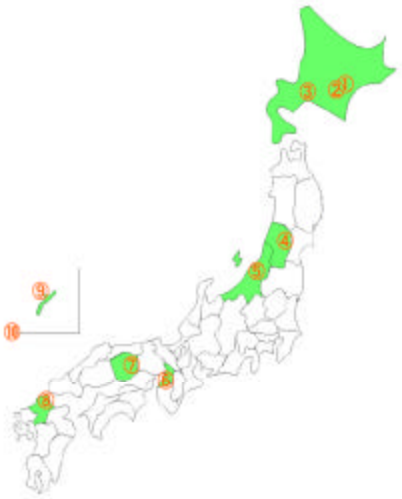
By the end of 2009, Nippon Oil Corp. plans to start producing bio-ETBE. The firm will build a facility capable of turning out 100,000 kl of ETBE a year. Since all ETBE used for biofuel in Japan is currently imported, local production will help to lower transport costs and CO_2 emissions. The firm aims to purchase bioethanol from domestic sources in Hokkaido for roughly .40 per liter. Nippon Oil may import bioethanol to fill in the gap by insufficient domestic supplies. The firm estimates the demand for fiscal 2010 will come to 840,000 kl.

In addition, there are ethanol facilities in Yamagata, Osaka, Okayama, Fukuoka, and a well-known facility in Okinawa using sugar cane as the fuel stock. (Please see the complete list in Figure 2 below.)

In order for these plants to make commercial sense, these commodities must be purchased at a significantly lower-than-market price. In the case of rice, it would have to be cheaper than feed-quality rice, which is already one-fifth the price of table rice. Like rice, prices of wheat and sugar beets are also very tightly managed by the government. Therefore, there is little incentive for farmers to sell these commodities at a price these ethanol plants can afford unless the GOJ provides an additional incentive to support the price gap.

The above-mentioned pilot projects and small-scale production facilities will not be enough to meet the goal to domestically produce of 50,000 kl of bioethanol by 2011 and the target to replace fossil fuels with 500,000 kl (oil basis) by 2010. Thus, the emphasis has shifted to research and development of cellulosic technology using readily available inputs that will not compete with the food supply, e.g. rice straw. MAFF has submitted a budget request to the GOJ – indeed the Minister himself has requested the money – for . 3.2 billion (approximately USD 30 million) for soft-cellulosic research. The money would be divided among 3-4 projects selected through an RFP process. MAFF will contribute 50 percent of the project costs.

Figure . GOJ supported Bioethanol Verification Projects



	Location	Operational Body
1)	Hokkaido, Shimizucho	Hokkaido Bioethanol Co., Ltd (Hokuren, Mitsubishi Corp., Kirin Brewery Co., Ltd.)
2)	Hokkaido, Tokachi	Tokachi Industrial Promotion Organization, etc
3)	Hokkaido, Tomakomai	Oenon Holdings Inc
4)	Yamagata, Shijo City	Shinjo city
5)	Niigata, Niigata City	JA Zen-noh
6)	Osaka, Sakai City	Taisei Corp., Marubeni Corp., Osaka Prefecture, etc
7)	Okayama, Miniwa City	Mitsui Engineering & Shipbuilding Co. Ltd.
8)	Fukuoka,Kita-Kushu City	Nippon Steel Engineering Co., Ltd.
9)	Okinawa, Ie Island	Asahi Breweries Ltd.
10)	Okinawa, Miyako Island	Okinawa Sugar Co., Mitsui & Co.

	Supporting Ministry	Raw Materials	Plan/Status
1)	MAFF	Off-spec wheat, sugar beets	Produce 15,000kl/year from FY2009.
2)	MAFF, METI, MOE	Off-spec wheat, corn	Production of bioethanol. Test runs on E3 and E10
3)	MAFF	Rice	Produce 15,000kl/year from FY2009.
4)	MAFF	Sorghum	Production of bioethanol.
5)	MAFF	Rice	Produce 1,000kl/year from FY2009.
6)	MOE	Construction wastes	Produce 1,400kl in 2007; 4,000 kl in 2008.
7)	METI	Lumber wastes	Production capacity: 250 kl/day
8)	METI, MOE	food wastes	Production of bioethanol.
9)	MAFF, METI, MOE, Cabinet Office	Molasses	Production of bioethanol. Test runs on E3.
10)	Cabinet Office, MAFF, METI, MLIT, MOE, Fire & Disaster Management Agency	Molasses	Production of bioethanol. Test runs on E3.

Source: METI

Producing bioethanol from woody biomass – MAFF's new scheme to revitalize the forest industry

66 percent of Japan is covered in forest. This resource is plentiful but it must be maintained. As part of its management plan, the GOJ is seeking ways to utilize wood waste for producing biofuel while maintaining the forest.

In its budget for FY2008, MAFF allocated ¥1.2 billion (approximately USD 12 million) for revitalizing the forest industry by promoting the production of biofuel and plastics from forest waste. Currently, 8.6 million m^3 per year of forest waste is left unused in Japan. Early this year MAFF invited public participation in conducting the research and development projects to produce carbon neutral fuel and materials from forest waste. MAFF proposes the following uses of forest waste: Biofuel for transportation and raw materials for chemical products to be produced utilizing cellulose, hemicellulose, and lignin (ligno-phenol) derived from woody materials. For example, 1) Bioethanol and plastic can be produced from cellulose; 2) Carbon

fiber and plastic can be made from lignin; and 3) Biomethanol can be produced from woody biomass. MAFF indicates the potential markets as follows:

Ethanol for transportation	¥432 billion (approximately USD 4.3 billion) (Projection based on GOJ's target to produce 6 million kl of bioethanol to replace gasoline by 2030.)
Methanol	¥78 billion (approximately USD 780 million) (value of imports)
Carbon products	¥165 billion (approximately USD 1.65 billion) (value of sales)
Plastic	¥2.770 trillion (approximately USD 27.7 billion) (value of sales)

MAFF aims to produce 2 to 2.2 million kl of bioethanol from woody materials by 2030 and to create new businesses whose total value would be ¥200 billion by 2018.

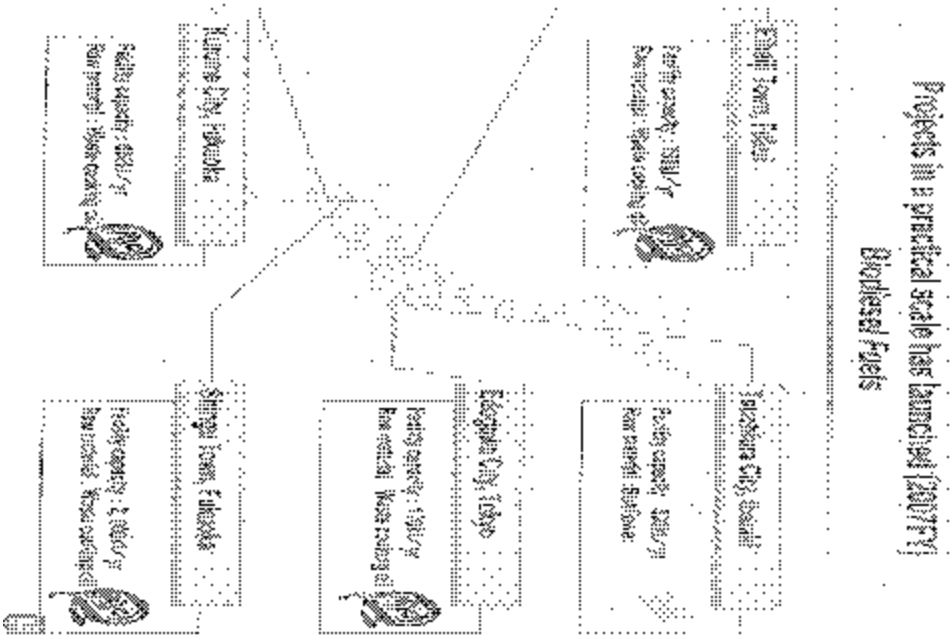
However, some forest industry sources say that producing biofuel from wood materials is not easy. Firstly, a technical breakthrough is needed to extract sugar efficiently from cellulose. Secondly, the wood wastes are scattered around the forests. A system to collect those scattered materials efficiently must be created. Otherwise the production cost of ethanol will be too high. Most experts believe that the most efficient and effective way to utilize wood wastes is to simply burn and generate steam or electricity at the location.

Bio-diesel Production

Several municipal governments and regional NPOs are conducting small-scale bio-diesel feasibility projects. A couple of restaurant chain operators are cooperating in the projects to collect used vegetable oil. The oil is processed into bio-diesel fuel for use in government vehicles or municipal buses. The current annual production of bio-diesel fuel is estimated to be 4,000 to 5,000 kl per annum.

In May 2006, Nippon Oil Corporation and Toyota Motor Corporation announced that they jointly developed a palm oil-based bio-diesel that performs comparably to gasoline. They claim to have removed the oxygen from the palm oil, which would normally cause the fuel to degrade. Nippon Oil aims to develop a commercially viable bio-diesel by 2010.

Figure 3 BDF Projects



Source: MAFF

Impact Of Use Of Agricultural Feed Stocks In Biofuel Production On Existing Markets

Previously, biofuels policy aimed at nurturing agriculture and revitalizing rural communities and one of the ways of doing so was increasing agricultural production. Also included in the initial plan but now receiving the most focus is utilizing existing feed stocks such as rice straw and off-spec wheat. This is in part a reaction to the "food vs. fuel" debate that has received media attention in Japan. It also reflects a strategic refocus on how Japan can best achieve its goals in the biofuels sector. Thus, taking used vegetable oil, rice straw or even certain rice stocks off the market doesn't take away from existing markets for feed, etc. Even if these ethanol plants absorb traditional commodities like rice or sugar beets, their impact on the existing food and feed markets would be negligible because the amounts are fractions of total supplies of these commodities in Japan: rice about 0.4 percent; wheat, 0.6 percent; and sugar beets, 3.5 percent.

BILATERAL TRADE AND INVESTMENT

Trade

While Japan imports measurable amounts of ethanol for industrial use, roughly 487,000 kl in 2007, imports of ethanol for transportation are negligible. Future imports of ethanol for fuel may be possible from Brazil given the joint ventures established between Japanese and Brazilian firms.

ETBE imports are more significant in Japan and have just taken off in the past two years. Prior to 2007 no imports were recorded but, as noted in the prior section Japan's Gasoline Market, 7,500 kl of ETBE were imported from France in 2007 and 6,700 kl from Brazil are

forecast for 2008. In addition, 12,800 mt of biodiesel was imported in 2007, roughly on par with the past 4-year trend. (Please see Statistical Tables at the end of this report).

Investment

Japan is engaged in a mixture of public and private investment and development projects in other countries. In terms of development, in order to help reduce green house gas emissions Japan will provide technical assistance to Malaysia for producing biodiesel fuel.

Several Japanese trading companies have shown interest in Brazilian ethanol investments. This includes sugar cane farms as well as the associated ethanol production facilities. For example, in March Mitsui and Petrobras announced a joint venture in the Brazilian states of Mato Grosso, Goias and Minas Gerais. According to press reports, one of the main goals is to export the sugar-based ethanol overseas, including to Japan. The team is expecting to produce 1 million kl of bioethanol. In most other cases, it is not clear whether the ethanol produced from joint ventures will be exported to Japan, although it is a distinct possibility.

RESEARCH AND DEVELOPMENT

Japan's scientific community, including universities, public and private research institutions, has been expending significant effort toward basic and applied research related to biofuel. Areas of research emphasis are listed below.

Research
Breeding, crop production, fuel conversion efficiency research

- Crop breeding, esp. rice - Oryza sativa, for biofuel production
- Application of modern biotechnology for cellulose-rich crops
- Production and cultural methods specialized for biofuel purposes
- Technology for efficient energy conversion
- Establishing fermentation technology of cellulose-based materials for ethanol production
- Technology for efficient gas conversion from biomass
- Technology for efficient methanol conversion from biomass
- Extraction technology of high value material from industrial by-products
- Ethanol production technology with low-energy input
- Cropping technology for high oil, sugar and/or starch content in biomass
- Large scale production system for sugar cane
- Establishment of crop production system with low energy requirement
- Utilization of by-products and/or residue from biofuel production

Wood based material specific research

- Substitution of heat energy required during biofuel production process by the heat released from waste incinerator.
- Utilization of waste as wood based biomass such as industrial waste (i.e. bark, mill ends, sawing chips), forest management (lumber from thinning), paper waste, construction waste (scrapped wood materials from building), and others for:
  - Wood chip fuel
  - Wood chip fuel for electric generation
  - Cellulose-based ethanol production
- Conversion of wood based biomass for gas, charcoal or esterifies energy (BDF)

Bio-diesel specific research

- Utilization of micro algae, esp. Botryococcoccus, for biodiesel production
- BHD production from palm oil

The GOJ has allocated a significant amount of budget for research, development and demonstration of biofuel. Details are listed below.

Biofuel related budget (unit: million yen)
Ministry of Internal Affairs and Communication
- Securing safety measures for the use of newly developed technology and material (.60m)

Ministry of Education, Culture, Sports, Science and Technology
- Part of "Efficient and effective promotion of science and technology policy enforcement" (Creation and operation of locally circulated energy system) (.1,320m)*

Ministry of Agriculture, Forestry and Fishery
- Project for the promotion of total environmental biomass measures (.550m)
- Project to establish the technology to utilize soft cellulose (.4,062m)
- Experimental project to utilize biomass released from food service industry (.70m)
- Project to establish locally produced biodiesel for local agricultural machinery consumption (.122m)
- Demonstration phase of locally-distributed biofuel model case (.5,435m)
- Project to create new business model utilizing forest resource (.1,200m)
- Development of biomass-based technology to promote local economy (.1,493m)
- Development project for technology to utilize marine biomass and resource (.90m)
- Research project for the reduction of CO2 emission from fishing boats (.20m)
- Project to develop fishing boat utilizing biomass for self-contained fuel system (.98m)

Ministry of Economics, Trade and Industry
- High efficient energy conversion technology for biomass use (Part of the Research and development of new energy technology) (.8,200m)*
- Project to create local standard model of E3 distribution (.450m)
- Demonstration project for the introduction of biomass based energy (.1,132m)
- Field test project to utilize heat released from biofuel (Part of the Field test project of new energy technology) (.9,113m)*

Ministry of Land, Infrastructure, Transport and Tourism
- Assessment project for safety and environmental impact of new energy (.35m)
- Promotion of development and realization of next generation low impact vehicle (.600m)*
- Introduction and promotion of biomass resource suitable for Hokkaido Prefecture (.976m)*

Ministry of Environment
- Demonstration and evaluation of practical use of green energy (.2,500m)
- Promotion of green energy use (.1,000m)
- Technology development for global warming measures (.3,709m)
- Survey of the expansion of utilization of biofuel from waste (.30m)

* Includes non-biofuels projects

Bio-Energy Use In Other Areas

There are many small-scale projects – both public and private sector – that are attempting to utilize biomass for energy or other uses.

One example is how soy sauce manufacturer the Kikkoman Corporation is testing a pilot plant to produce biogas from a by-product of soy sauce production. Since 2002, Kikkoman has been evaluating a process that uses fermentation to turn leftover soy sauce cake into methane gas. The methane produced by the pilot plant powers a cogeneration system that generates a small amount of the electricity used by the soy sauce factory, and produces steam used to dry residues from the fermentation process. Since 2005, Kikkoman has been studying the feasibility of a commercial-scale field test of the technology in cooperation with the GOJ's New Energy and Industrial Technology Development Organization (NEDO). However, during a recent visit to the facility, Kikkoman reps said the company has postponed the larger-scale project due to growing demand for its soy sauce cake for animal feed now that rising grain prices have made soy sauce cake an attractive substitute.

According to Daily Lumber News reports, the largest biomass power plant in Japan will start operation this June 2008. Kaminoike Bio-energy (¥100 million (approx USD 1 million) in capital; 50% by Mitsubishi Corp and the other 50% by Chugoku Lumber) is setting up a biomass power plant in Kajima, Ibaraki Prefecture, where Chugoku Lumber has one of its lumber processing facilities. The power plant plans to supply steam to generate electric power to seven feed companies nearby thru Tokyo Electric Co.

Statistics

Biofuel Production/Consumption/Trade (KL)

	2003	2004	2005	2006	2007
Ethanol for Industry Use					
Beginning stocks					
Production	330083	389375	394754	509813	457518*
Imports	403911	494562	509161	502304	468611
Total supply	733994	883937	903915	1012117	926129
Exports	132	207	22664	156	193
Consumption	733862	883730	881251	1011961	925936
Ending stocks	0	0	0	0	0

HS Codes: 220710, 220720
Souces: METI, MOF
*Estimate

Biofuel Production/Consumption/Trade (KL)

	2003	2004	2005	2006	2007
Bioethanol for Transportation Use					
Beginning stocks	0	0	0	0	0
Production	0	0	0	30	1430
Imports	0	0	0	0	0
Total supply	0	0	0	30	1430
Exports	0	0	0	0	0
Consumption	0	0	0	30	1430
Ending stocks	0	0	0	0	0

Biofuel Production/Consumption/Trade (KL)

	2003	2004	2005	2006	2007	2008*
Bio-ETBE						
Beginning stocks	0	0	0	0	0	0
Production	0	0	0	0	0	0
Imports	0	0	0	0	7500	6700
Total supply	0	0	0	0	7500	6700
Exports	0	0	0	0	0	0
Consumption	0	0	0	0	7500	6700
Ending stocks	0	0	0	0	0	0

** Forecast*

Biofuel Production/Consumption/Trade (MT)

	2003	2004	2005	2006	2007
Biodiesel					
Beginning stocks	0	0	0	0	0
Production	0	0	0	5*	5*
Imports	9584	12639	12349	16929	12808
Total supply	9584	12639	12349	16934	12813
Exports	0	0	0	0	0
Consumption	9584	12639	12349	16934	12813
Ending stocks	0	0	0	0	0

HS Code: 382490-200**

** MAFF Estimate, ** Including other than biodiesel*