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Biodiesel Sweeps China in Controversy

by Jiao Li

Everyone seems eager to get a share of China's biofuels pie. Liang Yulin, a 28-year-old real estate tycoon in southern China's Guangzhou City, began investing in biodiesel production last October. Using palm oil imported from Southeast Asia, the manager of the Guangzhou Tinyo Real Estate Development Company plans to turn out 50 tons a day, selling the fuel to fishing boats that work around the Pear River Delta.

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Although he has yet to see returns from his new investment, Liang says he will keep persevering. And he is not alone to venture in this seemingly promising industry. "As far as I know, there are dozens of biodiesel companies just in Guangzhou," he said.

Even the latest price cut in the international oil market does not seem to dampen Chinese enthusiasm for the new energy resource. Leading the game are a variety of government-supported demonstration projects. State-funded biodiesel production lines have been reportedly built in Guizhou, Guangxi, Shandong, and Anhui, with capacities varying from 300 to 600,000 tons a year. The raw materials range from used cooking oil to cotton seed, tung oil tree, and "organic" wastes.

What is mostly promising, according to the Chinese Ministry of Agriculture, is a new kind of hybrid rapeseed developed by the Academy of Agricultural Sciences to meet the market demand for renewable energy. The rapeseed has an oil content of 54.7 percent, which set a record, according to Wang Hanzhong, principal investigator of the project at the Academy's Institute of Oil Crops Research.

China's Yangtze River Valley is the world's largest rapeseed producer, accounting for nearly one-third of the total rape yield, Wang said. "It has the potential to produce 40 million tons of biodiesel per year, equaling the oil output of one-and-a-half Daqing Oilfields," he added. The Daqing Oilfields is currently China's leading crude oil producer.

In parallel, the United Nations Development Programme and China's Ministry of Science and Technology are co-funding a four-year project in southwestern China's Guizhou, Sichuan, and Yunnan provinces to encourage local farmers to grow Jatropha curcas trees as raw materials for biodiesel. In addition to producing the fuel, the project aims to eliminate poverty and improve fragile ecosytems. Initial government input is necessary, since "farmers will not plant these trees before they are sure it is profitable," said Program Coordinator Xu Yunsong.

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Aside from oil crops, woody plants are considered another key source for biodiesel. A survey conducted by the Chinese Academy of Forestry in 2004 identified 151 families of oil-bearing woody plants, with 697 genera and 1,553 species, many of which can be tapped for biodiesel production, according to Wang Tao, academician of the China Academy of Engineering and chief scientist of the forestry academy. Of these, 154 species have an oil content of more than 40 percent, while nearly 30 species of trees or shrubs have a comparatively centralized distribution that can be used as convenient raw

materials for biodiesel, said Wang.

One of the most promising options for large-scale biofuel use is the Chinese pistachio (pistacia Chinensis Bungo), the only species of the cashew family found in China. The survey identified the woody plant as having an oil content of more than 40 percent, and it grows in 11 provinces of the country, covering a total area of over 66,000 hectares, mostly on mountains or hills.

The forestry academy is cooperating with local biofuel producers to exploit these resources. One partner, the Zhenghe Bio-Energy Company Limited, a private business in northern China's Hebei Province, has-within two years-developed a capacity of 20,000 tons of biodiesel a year, using local Chinese pistachio as the raw material. Wang Tao expects production to expand to 100,000 tons by the end of 2007.

Behind the enthusiasm in China's bustling biodiesel development, however, is disorder in both production and marketing, said Wang Zhongying, director of the Energy Research Institute of the Center for Renewable Energy Development in Beijing. "Driven by the potential profits from biodiesel, many private investors just go ahead with production and marketing without any reference to the government," he said.

As a result, it is not even known how many biodiesel factories exactly exist in China, said Zhu Ming, dean of the Academy of Planning and Design under the Ministry of Agriculture. Also lacking are standards and regulations for the biodiesel industry, according to Professor Tan Tianwei of the Biological Sciences and Technology Department of Beijing University of Chemical Technology.

This has frustrated eager investors like Liang from Guangzhou. "The cost and quality of biodiesel extracted from imported palm oil vary greatly from that made from waste materials," he said. "Yet without any business standards you have to cope with the unfair competition."

While calling for biofuel standards and regulations, however, many experts also worry about the land use of the oil crops. With limited arable land at less than 0.1 hectare per capita, experts argue whether China could afford to have more acreage of oil crops at the cost of grain. "We don't know how much non-food cropland is available to and needed by the fledgling biodiesel industry," Wang Zhongying said.

"There is no denying that biodiesel is battling for the soil with grain," said Zhou Bin, general manager of the Beijing FaitH Oil New Technology Corporation. "The oil our company used to produce is edible oil, for Chinese people's diet. Now it has been converted to fuel for Europeans' cars." Established in 2001, Zhou's company also supplies biodiesel machines manufactured by the SKET Company of Germany.

According to Zhou, much of the biodiesel produced in China goes to Europe. This upsets some Chinese experts. As farmers potentially earn more money from rapeseed and other biodiesel crops than from conventional food crops, they may give up food crops, leading to shrinkage of food production. "Is it justifiable to replace the feeding of people with the feeding of economy?" asked Jin Jiaman, executive director of the Global Environmental Institute, a non-governmental research institution focused on environmental issues.

Zhu Ming of the Academy of Planning and Design under the Ministry of Agriculture is less worried. "The government will control the overall situation by policy," he said. "There will be subsidies for food crops so that farmers won't earn less growing them."

Professor Gu Shuhua from the Institute of Nuclear and New Energy Technology of Qinghua University raised the issue of cost. "So much money and energy has been thrown into it, but are we going to get enough biodiesel to justify the cost?" he asked.

Fortunately, said Wang Tao, oil crops are not the only option, and some woody energy plants, like Chinese pistachio, do not compete with farmland. Jin Jiaman has proposed that the government do a cost analysis to see whether it is wise to plant trees for the production of biodiesel. "For example," she said, "if a biodiesel factory is to be built in Xishuangbanna, we should calculate how much land area it will require for raw material tree plantation, whether the land is not for food crops, how much energy it will consume to create biodiesel for Beijing, etc. If the output cannot pay for the input, we should not be in a hurry to proceed."

But such controversies do not seem to be slowing the pace of biodiesel development. Wang Tao of the forestry academy is calculating the potential capacity of the fuel sourced with Chinese pistachio. "If one hectare of the Chinese pistachio forest produces 7,500 kilograms of seeds each year, then we'd have 500 million kilograms of the raw materials annually," he said. "That will produce about 200,000 tons of biodiesel."

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