

BIOENERGY NEWS

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FEATURE ARTICLE:

Biodiesel Sweeps China in Controversy

by Jiao Li

Acknowledging that fossil fuel resources could be eventually exhausted, the Chinese government has created a blueprint for the development of renewable energy. Biodiesel has found its way onto the government agenda, especially since China is abundant in plant species that can be used for the fuel's production.

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". 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 ecosystems. 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 general 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.

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 Centre 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.

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.

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 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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NEWS BRIEFS:

WA waste processor back in action after odour solution

The South Metropolitan Regional Council's (SMRC) \$70 million waste composting facility in Perth will restart processing of organic waste after the lifting of an Environmental Protection Act Prevention Notice based on complaints from neighbours about the smell.

The Department of Environment & Conservation (DEC) has conditionally revoked the notice handed to the Canning Vale facility in December. Acting deputy director general Robert Atkins said the notice was removed after the department received an independently verified assurance of steps likely to resolve the problem. Specialist consultant The Odour Unit has worked with the SMRC on the specific requirements of the operation of bio-filters and how to avoid the malfunctions that caused the odours. A specific moisturising maintenance program has been developed for the bio-filters to take account of the dry Western Australian climate. "Modifications to the air collection system will improve the efficiency of the removal of odorous air and humidifiers will be installed so that moist air enters the bio-filters, preventing them from drying out," said Atkins. "We are satisfied that the centre's composting facility,

particularly the bio-filters, should operate within the approved conditions and commitments given to DEC by the SMRC." Since December the organic material has been landfilled. With conditional approval to begin receiving waste again, the facility will operate at 50% capacity this week. "If independent consultants confirm it is operating in compliance with its ministerial conditions in relation to odour emissions during this time, the facility can then increase to 100% capacity," Atkins said. "The SMRC will also be required to institute additional monitoring and bio-filter maintenance, including daily inspections by odour consultants, until all plant air collection system modifications are completed." Monthly inspections will be conducted for the next year and SMRC has agreed to change its complaints management and routine ambient air monitoring procedures to ensure periodic independent verification of performance.

World-leading wastewater plant for Brisbane

A \$116 million upgrade to Brisbane's Oxley Creek wastewater treatment plant could make it the most advanced in the world, says Brisbane City Council. As well as increasing capacity, the upgrade introduced an Australian-first biological nutrient removal system and thermal hydrolysis.

The plant, which will supply recycled water to the city's industry, has received the nod from local environmental groups and is also the first in Queensland to process biosolids, converting them into fertiliser. The chair of the council's Water and City Businesses Committee, Cr John Campbell, said the upgrade could reduce the nitrogen content of the treated wastewater from 2,400kg a day to 200kg, "a reduction of almost 90%". "The plant also incorporates an Australian first. It uses state-of-the-art struvite precipitation biological nutrient removal system," he said at the opening on Saturday. "The struvite precipitation process has already successfully reduced the levels of nitrogen and phosphorus discharged into local rivers and Moreton Bay." The plant has taken pressure off the city's drinking supplies, with capacity increasing from 42ML per day to 65ML per day. Despite the capacity expansion, Cr Campbell said there was no increase to the plant's environmental footprint. "The methane generated from this process (biological nutrient removal system) is then tapped off and used to generate electricity for the plant and reduce carbon emissions. It really is a visionary design," he said. The upgrade also replaced the chlorine

disinfection process with ultraviolet light disinfection, further improving plant performance by eliminating chemicals in the treated water. The Brisbane Water Enviro Alliance (BWEA), a collaborative project team involving asset owner Brisbane Water, constructor John Holland Group, wastewater specialist Aquatec Maxcon and consulting engineering firms MWH and JWP, completed the upgrade over four years, under budget and on time

EU ministers agree biofuel target

EU energy ministers have agreed to increase the share of biofuels used in transport to 10% by 2020.

But at a meeting in Brussels they were unable to decide whether a target of getting 20% of energy from renewable sources by 2020 should be binding.

They also differed over a proposal to split energy utilities into separate production and distribution companies.

The question of whether the renewables target should be mandatory will be decided by EU leaders next month.

All the proposals discussed by the ministers were part of a package of measures put forward by the European Commission in January to tackle climate change and improve Europe's security of energy supply while maintaining the EU economy's competitiveness.

Next week environment ministers will discuss the commission's headline proposal of a unilateral 20% cut in greenhouse gas emissions by 2020 - or a 30% reduction if agreement can be reached between all developed countries.

The energy ministers did not approve the mechanisms proposed by the commission for "unbundling" energy supply from distribution.

They agreed only to the principle of "effective separation of supply and production activities from network operations (unbundling), based on independently run and adequately regulated network operation systems".

France is among a number of countries opposing the plan to free up access to energy distribution networks, by loosening the control of Europe's big energy production companies such as Germany's E.ON and RWE and France's EDF.

Belgium, Britain, Denmark and Sweden supported ownership separation, while France,

Estonia, Latvia, Slovakia and the Czech Republic opposed it, Reuters quoted an unnamed EU official as saying.

Energy Commissioner Andris Piebalgs said the ministers had broadly backed the goal of getting 20% of energy from renewable sources by 2020, but wanted more information about how the burden would be shared between the 27 member states.

"After all the bluster from EU leaders on climate change over the past few months, it is shameful that their energy ministers seem to be already abandoning ambition on crucial concrete measures to protect our climate," said Green MEPs Claude Turmes and Rebecca Harms.

The energy package will be the main subject of an EU summit in Brussels on 8 and 9 March.



The Bioenergy Association of New Zealand Inc. (BANZ) comprises companies, research organisations and individuals who have an interest in markets for converting biomass or biowaste into energy. To receive this newsletter regularly contact the Executive Officer of BANZ for membership details by email: info@bioenergy.org.nz. Back issues of this E-zine are on the website, www.bioenergy.org.nz

EVENTS CALENDAR:

World Biofuels Markets Congress, Brussels, 6-9 March

Biofuels Congress & Exhibition, 7-8 March

Biofuels Finance & Investment, 6 March

Biofuels Sustainability Workshop, 6 March

Biofuels Applications Seminar 9 March

Website <http://www.greenpowerconferences.com/wbm>

Success & Visions for Bioenergy, Salzburg, 22-23 March 2007

A European workshop on thermal processing of biomass for bioenergy, biofuels and bioproducts.

Website www.thermalnet.co.uk

Ethanol 2007, Melbourne, 17- 20 April 2007

Website: www.ethanol2007.com

15th European Biomass Conference & Exhibition, Berlin, 7-11 May 2007

Theme "Biomass for Energy, Industry and Climate Protection - From Research to Market Deployment."

Website www.conference-biomass.com

International Training Workshop on Technology and Utilisation Biomass Gasification, Yingkou, China, , 1-20 September

Yongzhi Ren, Biomass Gasification Department, Liaoning Institute of Energy Resources (LIER), Yingkou, Liaoning Province, P.R. China.

Website: <http://gasifiers.bioenergylists.org/yinkougasworkshop07>

International Bioenergy, Jyväskylä, Finland, 3-6 September 2007

The main organizer is FINBIO - The Bioenergy Association of Finland.

Website: <http://seminaarit.ohoi.fi/default.asp?seminarID=6>

20th World Energy Congress, Rome, 11-15 November, 2007

Theme "Energy Future in an Interdependent World"