Press Release

New Energy and Industrial Technology Development Organization

http://www.nedo.go.jp/english/index.html

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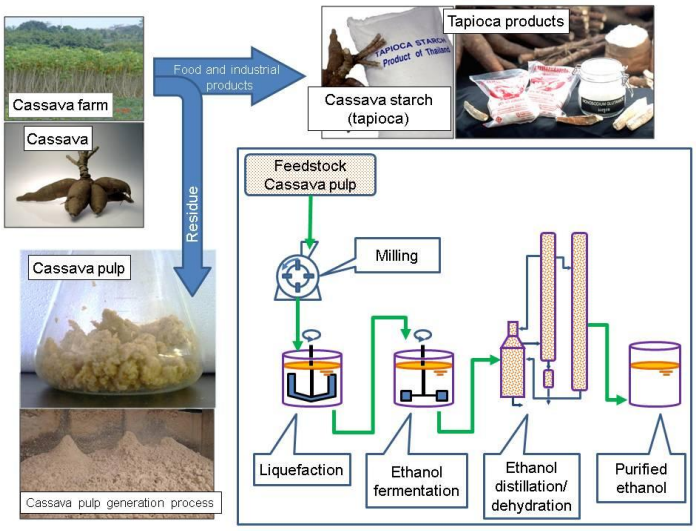
First Demonstration Project on Technologies to Produce Bioethanol from Tapioca Residue in Thailand

The New Energy and Industrial Technology Development Organization (NEDO) will launch a demonstration project utilizing technologies for producing bioethanol from cassava residue obtained after starch extraction (tapioca residue) in the Kingdom of Thailand.

The project, which will be carried out at a pilot plant with an annual ethanol production capacity of 80 kiloliters, is designed to demonstrate the effectiveness of technologies to produce bioethanol using thermotolerant yeast developed in Japan. NEDO aims to disseminate the technologies throughout Thailand as well as ASEAN countries where cassavas are widely cultivated.

To implement the project, a memorandum of understanding has been concluded between NEDO and the National Innovation Agency of Thailand.



Project period (tentative): FY2012–FY2015
Undried cassava pulp processing capacity: 1,000 tons/year
Bioethanol production capacity: 80 kiloliters/year
Budget: approx. 700 million yen
(NEDO portion: approx. 500 million yen)
Entrusted companies: Sapporo Breweries Ltd., Iwata Chemical Co., Ltd.

Production of Bioethanol from Cassava Pulp

1. Project Overview

Although Thailand's energy consumption is significantly increasing due to rapid economic growth, the country is heavily dependent on imports for its energy. Measures to prevent energy shortages are therefore urgently required. In this respect, the Thai government has expressed its intention to increase bioethanol production in order to ensure a stable energy supply.

Against this backdrop, NEDO focused on the fact that in Thailand, which is the largest cassava starch (tapioca) exporter in the world, a large amount of cassava pulp, which is a residue obtained after starch extraction, is discarded without being recycled. As cassava pulp is a non-food agricultural residue that contains residual starch and high levels of fiber, it does not compete with food supplies unlike first-generation biofuels derived from edible feedstock, such as corn. Moreover, cassava pulp is known as a 1.5 generation biofuel because it can be put into practical use relatively early in comparison to second-generation biofuels (bioethanol) derived from grass and wood.

This project, which will be carried out at a pilot plant with an annual ethanol production capacity of 80 kiloliters, is designed to demonstrate the effectiveness of bioethanol production technologies using thermotolerant yeast developed in Japan. In this project, which will utilize the above-mentioned technologies, bioethanol will be efficiently produced from highly concentrated and highly viscous unrefined starch residue of cassava pulp, which is generated at the largest cassava starch manufacturing plant in Thailand.

The project aims to contribute to the increase of biofuel production in Thailand through the utilization of an untapped resource that does not compete with food supplies. More specifically, by using bioethanol production technologies, Thailand's annual air-dried cassava pulp generation of 1.9 million tons (as of 2010) can be recycled to produce approximately 1,700 kiloliters of bioethanol a day and 620,000 kiloliters a year. The Department of Alternative Energy Development and Efficiency announced that the Thai government has set a target to supply 20.3% of the country's energy consumption from a renewable energy mix, which includes an increase of daily bioethanol production capacity from 1,300 kiloliters (as of 2011) to 9,000 kiloliters, by 2022. The dissemination of the technologies is therefore expected to support the country's effort to achieving this target.

2. Future Outlook

Data collected through this project will be assessed and examined until February 2016. Following the completion of the project, the first bioethanol production plant using the technologies will be constructed and operated through guidance provided to companies that generate cassava pulp. Moreover, in cooperation with Thai project participants, follow-up activities will be conducted, including seminars on bioethanol production

technologies using Japanese thermotolerant yeast as well as public relations events. The objective of the follow-up activities is to disseminate the technologies throughout Thailand, especially in the northeastern and eastern regions, which are known as the country's leading cassava production areas, as well as ASEAN countries, including Cambodia, Laos and Vietnam, with which Thailand has close ties through cassava starch trading.

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