



GranBio begins producing second-generation ethanol

Company starts operating the Southern Hemisphere's first cellulosic ethanol plant

São Paulo (BRAZIL), September 24, 2014 - GranBio, the 100% Brazilian industrial biotech company, has initiated production at the first commercial-scale plant for second-generation (2G) ethanol in the Southern Hemisphere. The Bioflex 1, unit built in São Miguel dos Campos, Alagoas, has an initial production capacity of 82 million liters of ethanol per year.

The 2G ethanol produced by GranBio is the cleanest fuel produced on a commercial scale in the world in carbon intensity - 7.55 gCO₂/MJ, an indicator confirmed by the Air Resources Board (ARB), from California. The calculation takes into account factors starting with the harvest of the raw material, through inputs and energy consumption, transportation and distribution through a port in California. No other fuel produced on a large scale is better for the environment and reversing climate change than that of GranBio, the first producer of 2G ethanol to have the carbon footprint approved by the American agency.

In pursuing the project, GranBio, which is controlled by GranInvestimentos S.A., invested US\$190 million to build the plant and US\$75 million on the steam and electricity co-generation system, the latter investment along with the Carlos Lyra Group's Caeté facility. Construction was completed in 20 months, quick as compared to any other undertaking of its size, and was managed by GranEnergia, company also controlled by GranInvestimentos S.A.

"When we announced the construction of the plant in Alagoas, in mid-2012, we took the risk of an innovator and pioneer in a project with transformative potential for the biofuels and biochemicals industries," said GranBio's president, Bernardo Gradin. "Beyond the inauguration of a plant, this project is proof that Brazil can lead the global biotech industry based on its agricultural potential," he added.

The 2G ethanol makes it possible to increase Brazilian production capacity per acre by 50% using agricultural waste – straw and bagasse, without need of expanding the cane fields. GranBio developed a system to harvest, store and process 400,000 metric tons of straw per year for Bioflex 1, which places it among the world's largest and most competitive.

GranBio's facility uses the PROESA[®] pre-treatment technology from the Italian company BetaRenewables (a company in the M&G Group), enzymes from Novozymes in Denmark, and yeast from DSM in Holland.



GranBio and Caeté invest US\$75 million in an unprecedented bioenergy solution

GranBio and Caeté, from the group Carlos Lyra, created a partnership for the integrated production of steam and electricity. Installed next to Bioflex 1, the co-generation system is fed by sugarcane bagasse and lignin – a byproduct of producing second-generation ethanol. This is an unprecedented bioenergy solution in Brazil, the first time lignin is being used to this purpose in the sugar-based alcohol industry. The companies' combined investment was US\$75 million.

The boiler of the cogeneration system will remain in operation for eleven months of the year, or eight thousand hours, in the harvest and inter-harvest period at the Caeté plant. As such, beyond meeting the needs of the two plants, the boiler will generate excess electricity on order of 135,000 MWh/year – enough to power a city of 300,000 inhabitants – which will be sold and become a source of revenue for the companies.

The investment in bioenergy reinforces an irreversible trend in the Brazilian energy market. In addition to being an alternative to meet Brazilian demand, generating energy with wastes previously left on the ground considerably reduces environmental CO₂ emissions.

About GranBio

Founded in 2011, GranBio is a Brazilian industrial biotech company, controlled by GranInvestimentos S.A., that creates solutions to transform biomass into renewable products. Pioneering the production of cellulosic (or second-generation (2G)-) ethanol in the Southern Hemisphere, the company is the only one in the sector to be active from start to finish in the chain of production – from raw material to distribution of the final product – integrating its own and third-party technologies.

More information: www.granbio.com.br

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