

# Raízen builds its first cellulosic ethanol plant and projects a production of 1 billion liters of ethanol by 2024

**R**aízen, the renewable energy leader in Brazil and the first integrated player in the sugar-energy sector, began constructing its first cellulosic ethanol production unit in the country. Within an installed capacity of 40 million liters of second-generation ethanol, the plant is being installed in the city of Piracicaba (SP), next to the company's Costa Pinto unit.

With an investment of R\$230 million (which include company funds and from the National Bank of Economic and Social Development - BNDES), the new plant is expected to start up in the second semester of this year. The company's New Technologies manager, Evandro Curtolo da Cruz, says that the main objective of the company is to take advantage of the synergy between Raízen's first generation unit and its second-generation unit, in order to reduce costs and take advantage of the logistics system that already exists in the region.

In an interview to *O Papel*, the executive provides more details about the project, which aims to produce 1 billion liters of ethanol in the next years, and also talks about future partnerships with the pulp and paper industry.

**O Papel** – What's the status on your second-generation ethanol plant project?

**Evandro Curtolo da Cruz** – The 40-million liter ethanol plant is being installed in Piracicaba (SP), next to Raízen's Costa Pinto unit. The new plant is in its construction phase and is expected to begin operating at the end of this year. In addition to the first unit in Piracicaba, the company plans on building another seven cellulosic ethanol plants by 2024, all of them next to existing first-generation production units. The expectation is that, once operating at full capacity, the units will produce 1 billion liters of ethanol. Raízen believes that cellulosic ethanol is one of the main paths for satisfying the growing demand for ethanol in Brazil and around the world.

**O Papel** – Once this first plant is inaugurated, in how much time does Raízen intend to begin supplying the market? Will there be a learning curve period?

**Cruz** – Construction and operation of Raízen's first cellulosic ethanol plant is part of the company's strategic plan. In this stage, we will have the scale up of technology used to commercial scale, and an associated learning curve of several months is being considered.

**O Papel** – What is the operational and commercial strategy behind the plant's construction? What markets does the company intend to focus on?

**Cruz** – The company strategy is to increase its current ethanol production without increasing the respective cultivated area, by processing the sugarcane straw available. This production increase can be earmarked for both the domestic and external markets, depending on market conditions.

**O Papel** – What are the challenges involved in commercializing second-generation ethanol? How does Raízen intend to overcome them?

**Cruz** – The main challenges in commercializing second-generation ethanol are basically associated to the scale up of technology and reduction of costs associated to the two main raw materials: biomass and enzymes. In order to overcome these challenges, Raízen carried out together with its technological partner Iogen Energy, extensive tests in pilot and demonstration scale. Tests are being developed since 2012 at a test plant in Canada, in order to be able to install in Brazil a unit with a high standard of excellence and with little margin of error. This research will continue in order to support operations of the first commercial plant, as well as optimize it. A partnership was also established with the biggest producer worldwide of enzymes, Denmark-based Novozymes, to develop specific enzymes for the process chosen. This company will be the exclusive supplier of enzymes developed to produce second-generation ethanol at the Costa Pinto unit. These enzymes are responsible for converting cellulosic material into sugar, in one of the production process stages.

**O Papel** – Is the technology used to produce second-generation ethanol the same as that used in the conventional production process? What are the main differences in the process?

**Cruz** – First of all, it is important to point out that the company is investing in second-generation to boost ethanol productivity without increasing cultivated area, taking advantage of the sugarcane bagasse and straw that today is only used for energy cogeneration. The synergy that the second-generation plant will have with the first-generation plant will yield logistics and cost gains for Raízen. In practice, waste from the ethanol production process (sugarcane bagasse, leaves and outer layer) undergo pretreatment in the fibers, which are destructured in the blowtank and transformed into soluble sugars through hydrolysis. Fermentation converts sugar into ethanol, which is then purified in distillation and then sold. Second-generation ethanol has the exact same chemical composition as first-generation ethanol. Therefore, it can be used for fuel purposes and in the chemical industry.

**O Papel** – Does the company plan on any type of integration, knowledge exchange, research cooperation with the pulp industry? Could this partnership have potential in the future, already thinking about biorefineries based on pulp production waste?

**Cruz** – Potential synergies between the production technology of cellulosic ethanol and the pulp industry exist and, once the technological scale up stage of Raízen's first plant is concluded, such opportunities will certainly be explored. ■