Biosyngas Project: a pilot plant for biomass gasification by entrained flow process.

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A 500kg/h pilot plant is planned to be installed in Piracicaba, utilizing sugarcane bagasse, sugarcane trash and wood picks as feeding material. The distinct characteristic of this project is the use of entrained flow gasification, following the concept of some German pilot plants like the Choren and Siemens projects in Freiberg. To feed the gasifier, the project intends to transform the biomass into a liquid by fast pyrolysis, or to a powder by torrefaction. After gasification and gas cleaning, the gas will be supplied to six different installations, five of which will be built by industrial partners and one will be available for academic purposes. Equipment and buildings will be designed and constructed in three years, one more year allowed for cold and hot commissioning, so that two thousand tons of biomass should be processed and the gas be delivered to the partners in the fifth year. Electric energy, biofuels and bioprecursors are among the goals of the partners' intended use of the gas, but that is outside the scope and budget of the project. The proposed budget is R$ 80 million, to be shared by BNDES, FINEP, Sao Paulo State Government and the industrial partners.

Four research institutions are directly involved in the development of the project concept, namely Escola Superior de Agricultura Luiz de Queiroz (ESALQ), Centro de Tecnologia Canavieira (CTC), Centro de Tecnologia do Bioetanol (CTBE) and Instituto de Pesquisas Tecnológicas do Estado de São Paulo (IPT). The whole Project will be managed by IPT and the building site is being negociated with ESALQ.

The fast pyrolysis and the torrefaction equipment will be bought, the gasifier will be designed and built during the project, gas cleaning equipment will also be bought. The project concept includes the participation of a large array of Brazilian researchers in the designing of the gasifier, but it does not exclude the use of foreign intellectual property.

The paper will discuss the main constraints that must be taken into account in the designing of the gasifier, including considerations of ash behavior, gasification nozzle and gasifier geometry, among others.