



IATA 2011 Report on Alternative Fuels

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5.5 The Brazilian Biojet Fuel Platform

From the initial business concept presented last year, the Brazilian Biojet Fuel Platform is bringing together additional stakeholders to structure and implement an integrated biojet fuel value chain in Brazil focused on

three key units: the Sustainable Multi-Feedstock Unit, the Logistics Unit, and the Biorefinery Unit. INOCAS will advise on the RSB compliance issues, Quinvita will supply technology and planting material for Jatropha projects, CNAGA will integrate logistic systems, and Santiago Advisors will provide project management and financial advice (see Figures 6 and 7).

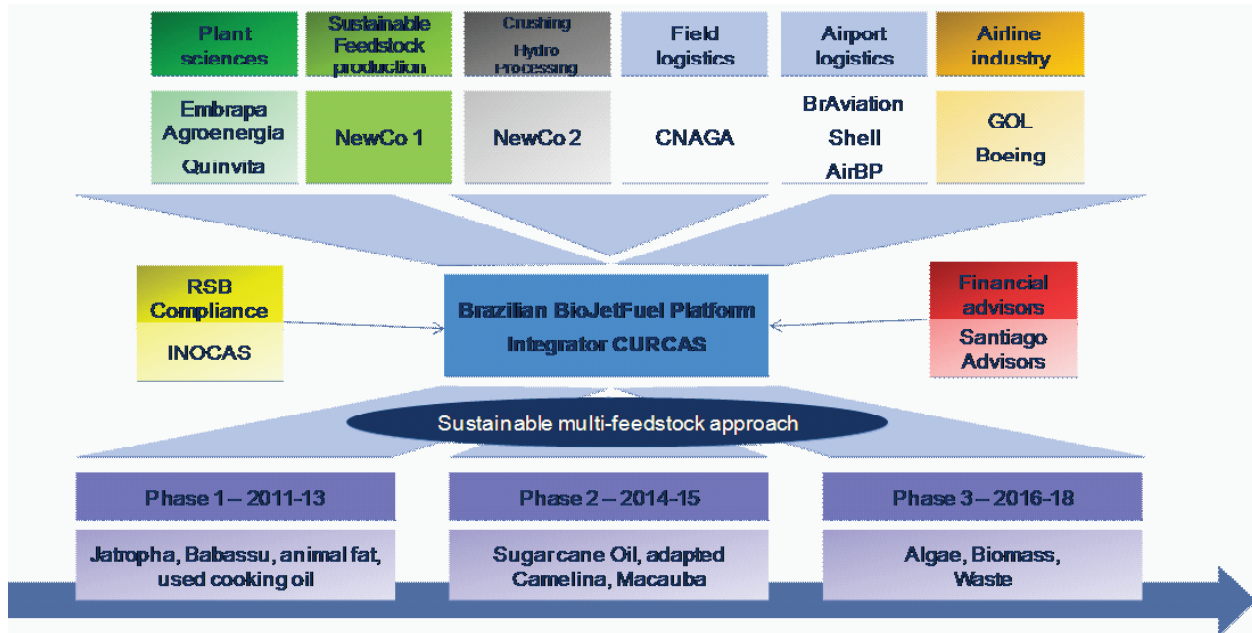


Figure 6 – Schematic showing contributors' roles in the Brazilian Biojet Fuel Platform. The six main areas of focus are shown along the top, with the three phases of feedstock development along the bottom, and the advisors on either side.

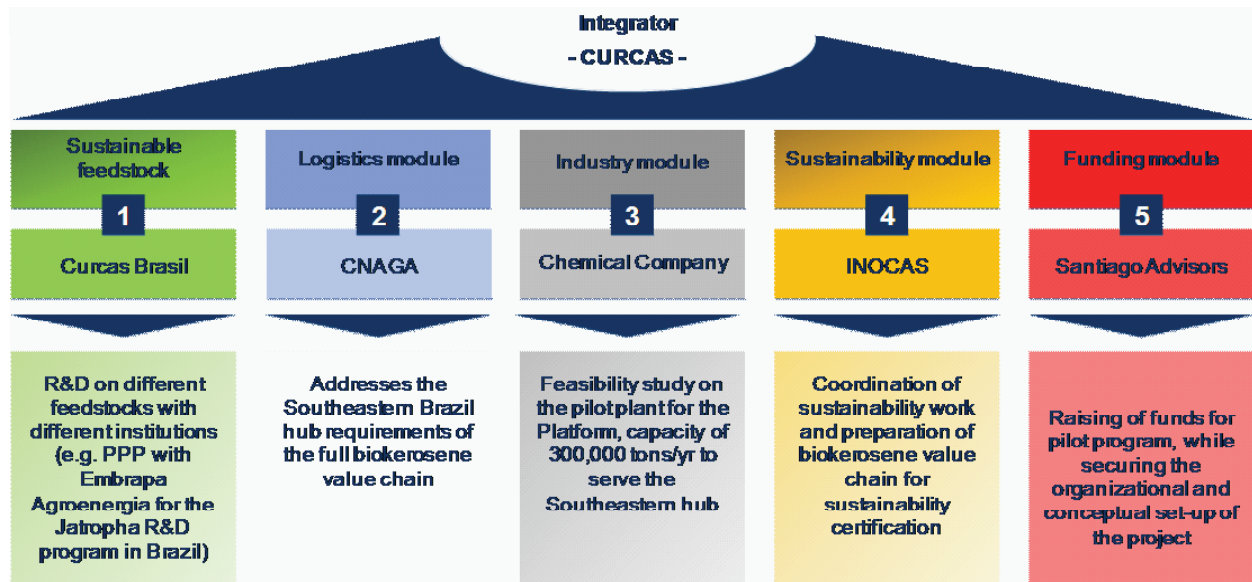


Figure 7 – The five modules of the Brazilian Biojet Fuel Platform.

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5.5.1 The Sustainable Multi-Feedstock Unit

The strategic mission of this unit is to deal with the major challenge of providing competitively priced sustainable feedstock to the Platform, respecting the sustainability criteria of RSB, in the volume demanded by the Carbon Neutral Growth (CNG) goals of IATA.

Competitively priced sustainable feedstock can only be achieved if the right planting material (high yield productivity, disease resistant, etc.) is made available

to farmers, with adequate financing mechanisms, to foster an energy and food program, envisaging both food and energy security.

Therefore, much emphasis at this initial structuring phase of the integrated biojet fuel value chain is being placed on a Jatropha research and development under a public-private partnership (PPP) with Embrapa Agroenergia, the foremost research institution of the Brazilian Ministry of Agriculture (MAPA). This means coordinating a Brazilian research network amongst the institutions shown in Figure 8.

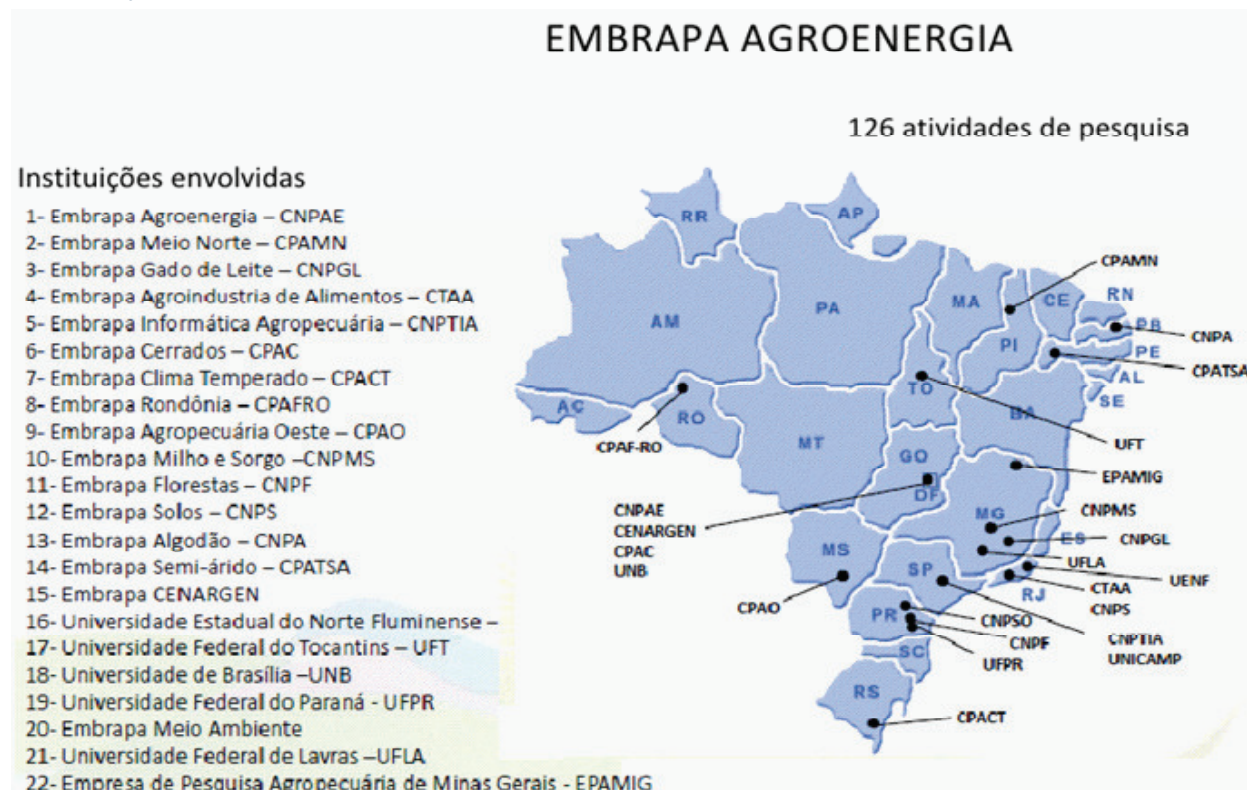


Figure 8 – Map showing the Brazilian Ministry of Agriculture institutions engaged in relevant research activities.

As part of the multi-phase feedstock program, the Platform is undertaking the domestication issues for Jatropha, Macauba, Dende, Babassu, and adaptation of Camelina as a winter crop to the warmer climates of Brazil.

Several advances have been made in the Brazilian Jatropha domestication program, including better understanding of the plant physiology, pruning techniques adjusted to the plant physiology, mechanized harvesting, seed cake detox, etc. Pan American genetic material exchange has been led by Curcas Diesel Brazil, Global Clean Energy, Quinvita and SG Fuels; each offering their material and services in the Brazilian market. With cooperative agreements between ABPPM and Pan American research institutions, one can expect that adequate initial planting

material will finally be available for the scaling up of Jatropha plantations in Brazil next year.

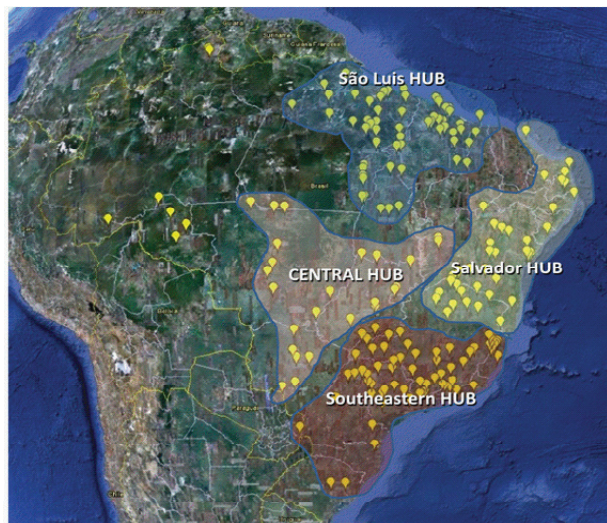
An agreement has been reached with Longido to set up the value chain to explore the potential of 18 million hectares of native babassu forest, based on present brownfield in Maranhão, and feasibility check of the value chain for biomass, and oil.

Procedures are underway for the introduction of Camelina in Brazil as a winter crop to soy, leveraging on the existing soy value chain.

Macauba and Dende will be the next cultures to be addressed by the research program of Embrapa Agroenergia with the Brazilian Biojet fuel Platform, uniting efforts for a comprehensive research and development program.

5.5.2 The Logistic Unit

Harvest logistics, consolidation and crushing centers, silos and tank farms, and integrated regional inter-modal transportation networks are being planned for each production hub. The first phase will deal with the Southeastern Hub, to serve the major markets of São Paulo and Rio. Final integration assurance with major airport logistic operators will be addressed once the value chain is in place.



In the first phase, sustainable feedstock will be exported while awaiting the local biojet fuel production plant to be fully operational.

5.5.3 The Biorefinery Unit

Based on the production hub concept, the Platform is finalizing the site and technology selection to install a pilot plant in the southeastern region to supply biojet fuel to the major airports of São Paulo and Rio de Janeiro in Brazil. Presently undergoing a technical evaluation, the pilot plant will be co-located with a major operating chemical company to reduce the time to market, and to optimize the production costs for final competitive pricing.

5.6 SWAFEA: A European Study on the Feasibility And Impact of the Introduction of Alternative Fuel in Aviation¹

5.6.1 Background

Committed to taking an active role in climate change mitigation and in the promotion of secure and sustainable energy sources, the European Commission's Directorate General for Mobility and Transport initiated the SWAFEA study in February 2009 to investigate the feasibility and impacts of the use of alternative fuels in aviation. Alternatives to crude oil-based kerosene are seen as an important component in the efforts to reach the target set by the European Directive for Renewable Energy (RED) to introduce 10% of renewable energy in transport by 2020. It's also an important development with view to the introduction of aviation in the ETS from 2012.

The study aimed to develop a comparative analysis of different fuels and energy-carrier options for aviation on the basis of current knowledge, and to propose a possible vision and roadmap for their deployment in order to facilitate and support future policy decisions.

The SWAFEA study, which delivered its findings and recommendations in April 2011², encompassed all aspects of the possible introduction of alternative fuels in aviation using a highly multidisciplinary approach. This included technical, environmental, and economic assessments. The study was carried out under the leadership of the French Aerospace Research Lab ONERA, in cooperation with a consortium of twenty partners³ bringing together European research organizations and representatives of virtually every major stakeholder in the aviation fuel chain.

1. The SWAFEA study was funded by the European Commission's Directorate General for Mobility and Transport under contract TREN/F2/408.2008/SI2.518403/SI2.519012. The contents or any views expressed herein have not been adopted or in any way approved by the European Commission and should not be relied upon as a statement of the Commission's or DG Mobility and Transport's views.

The contract was carried out by a team led by ONERA and gathering 20 partners from industry, airlines and research. Statements presented here represent a collective work and a general agreement on the high level conclusions derived from parallel works carried out in the frame of the study. As such, it does not engage the individual responsibility of each of these organizations and corporations on any and all the topics covered by the study.

2. SWAFEA final report is available on www.swafea.eu

3. SWAFEA partners : Airbus, AirFrance, Altran, Bauhaus Luftfahrt, Cerfacs, Concawe, DLR, EADS-IW, Embrarer, Erdyn, Iata, Ineris, IFPEN, Onera, Plant Research International (WUR), Rolls-Royce UK and Rolls-Royce Deutschland, Shell, Snecma, University of Sheffield