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Aviation Biofuels Initiatives in LAC

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Contents

> IDB philosophy

➤ IDB experience in supporting biofuel in LAC

> IDB aviation biofuel initiatives in LAC

> The future



IDB Philosophy

➤ Biofuels are an important driver of sustainable socioeconomic development in LAC.



IDB Biofuel Lending Experience

- → 3 ethanol plants in Brazil (U.S. \$ 269 million IDB, 2008):
 Largest biofuel investment in LAC
 - ➤ Located in the states of Minas Gerais and Goiás, far from the Amazon or any other protected area
 - > 4,500 high quality permanent jobs
 - > 420 million liters of ethanol per year for the domestic market
- ➤ Maple Ethanol Plant in Peru (U.S. \$ 245.5 million, IDB, CAF, FMO, Interbank, 2009)
 - Combined with efficient irrigation mechanization 153 ton / Ha
 - ➤ Includes 37MW cogeneration plant that sells electricity to the grid
 - ➤ 130 million liters per year using 7,800 hectares of sugar cane in a desert area in the Department of Piura, Peru



IDB Biofuel Technical Assistance

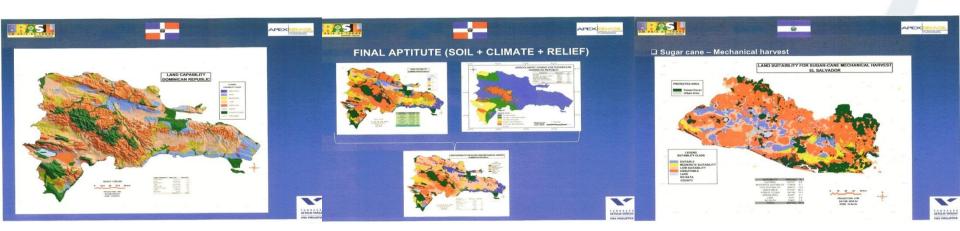
- ➤ Haiti, Guatemala and Honduras: Feasibility National Biofuels Program (BR-US Agreement, U.S. \$ 750k +, BR-T1086, December 2007)
- Guatemala: Plan of Action (MEM; U.S. \$ 400k, GU-T1095, December 2007)
- ➤ El Salvador: same (MINEC / CENTA, U.S. \$ 750k, ES-T1096, Mar 2008)
- Honduras: same (SP; U.S. \$ 600k, HO-T1101, Oct 2008)
- Brazil: Project Identification Sustainable Energy Development of Minas Gerais (BDMG; U.S. \$ 160k, BR-T1103, June 2008), and retraining of workers hand harvesting cane (UNICA, U.S. \$ 500k, BR-T1149; September 2009)
- Chile: Second Generation Biofuels (ForEnergy; U.S. \$ 1.000k, CH-T1096, September 2009)
- Colombia: C & T Innovation Biofuels (Colciencias; U.S. \$ 830k KPK / SECCI, CO-T1059; U.S. \$ 1.5M; CO-T1052 MME-other; February 2008)
- Guyana: Expanding Bioenergy Opportunities (MAG; U.S. \$ 925K; JSF / SECCI; GY-T1041, Mar 2008)
- Peru: Strategic Plan for Sustainable Energy and Bioenergy (MEM; U.S. \$ 1M SECCI, PE-T1146, Apr 2008)
- Dominican Republic: Bioenergy Program Support (CNE; U.S. \$ 750k SECCI, DR-T1036, September 2011).



IDB Technical Assistance to Brazil/US Biofuels MOU

(cooperation with third countries)

- >\$ 750,000 for: mapping raw materials, project recommendation, and to develop studies and assessments of national biofuels programs in:
 - ➤ El Salvador (APEX BR)
 - ➤ Dominican Republic (APEX BR and IDB)
 - ➤ Haiti, Guatemala and Honduras (IDB)





Aviation Biofuels Milestones in LAC

Brazil:

- ➤ Brazilian Alliance for Aviation Biofuels (ABRABA): Embraer, the Brazilian Aerospace Assoc, TAM, GOL, Azul, Trip, Unica, Algae Biotechnology, Amyris, Brazilian Association of Producers Jatropha (ABPPM) Established in May 2010.
- > Test flights TAM (Nov 2010 & June 2012), Embraer (Sep 2011), GOL (Jun 2012).
- SABB: Roadmap for Brazilian aviation biofuel current.
- > Expanded BR/US Biofuel & Aviation Protocols.

> Chile:

➤ LAN test flight Mar 2012.

Mexico:

- Flight Plan for establishing a sustainable biofuels industry for Aviation developed between 2010 and 2011.
- ➤ Test flights Interjet (Apr 2011), Aeromexico (Aug/Sep 2011).



Aviation biofuels will be an important driver of sustainable socioeconomic development in LAC

- ➤ Life cycle assessment of the production of biofuel from sugar cane, co-financed with Boeing and Embraer, results presented at Rio +20 (> 82% carbon reduction)
- ➤ Collaboration with Brazilian & U.S. governments on bilateral protocols.



Press Release 7/27/11

➤ Boeing, Embraer and BID finance analysis of sustainable aviation biofuel produced from sugarcane Amyris technology

Brazilian research group ICONE coordinated the study and the World Wildlife Fund will act as an independent consultant

SAO JOSE DOS CAMPOS, Brazil - Boeing (NYSE: BA), Embraer (NYSE: ERJ; BM & FBOVESPA: EMBR3) and the Inter-American Development Bank (IDB) announced that they will finance a sustainability analysis for production of biofuel developed by Amyris from sugar cane. The study will evaluate environmental aspects associated with the use of this renewable fuel produced by Amyris (NASDAQ: AMRS).

Last month, the IDB announced a regional cooperation to help public and private institutions develop a sustainable biofuels industry. The Amyris study is the first to be funded by the initiative.



Press



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Boeing, Embraer v BID

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Study

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sugarcane.

scheduled for completion in early 2012.

sisten bleretit des 747 voler avec du biodiesel à partir de canne à lucre?

avionneurs américain et brésilien Boeing et Embraer ont annoncé mardi c la Banque interaméricaine de développement (BID), une étude sur la vi; arburant à base de canne à sucre pour les avions.

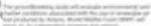
s nouvelles technologies pour produire des combustibles à partir de sour vent réduire significativement les émissions de gaz à effet de serre coms ne à sucre au Brésil», a affirmé Arnaldo Viera de Carvalho, responsable r l'aviation



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mbustível aviônico feito com produto reduzi)2 em 80%.

tudo de impacto será financiado pelo BID, Hi



BlueSky







Boeing y Embraer estudian uso d€ aeronaves.

biocombustibles en aviación



Boeing e Embraer financiam pesquisa para de: biocombustiveis para latos

Boeing to Fund Brazilian Sugar

Posted by BioHub Staff on 7/27/11 • Categorized as Ag Biolet C

Markets Feedstocks Fuels Latin America World News

As fabricantes de aviões Éloeing e Embraer vão financiar, em conjunto o Desenvolvimento (BID), um estudo de viabilidade de combustiveis a ba abastecimento de jatos. Com base em padrões internacionais de suster emissões de gases de efeito estufa no ciclo de produção em larga esca

A pesquisa é a primeira a per beneficiada por meio de acordo de coope públicas e privadas proposto pelo BID para ajudar no desenvolvimento Aviation and Climate Change Seminary IGAOH leadquarters, Montuéaly Conada, 23-24 October 2012 reduzir significativamente as emissões de pases de efeito estuda, como



- Support demonstration flights with GOL and Azul.
 - ➤ ICAO sponsored the GOL / Aeromexico /Air Canada/ Porter flights for Rio +20, each using different feed stocks.







Feasibility study of the first pilot plant for production of biojet for ASA of Mexico



Aeropuertos y Servicios Auxiliares







- Study on Camelina in Argentina: feasibility of cultivation in marginal areas in south of the country, includes analysis of economic, social and environmental issues.
- ➤ Brazil Action Plan for 2014 FIFA World Cup and Rio 2016 Olympics: to reduce/offset carbon footprint of international and domestic flights through use of biojet and operational improvements.



The Future

- ➤ IDB's and Risk Mitigation
 - **≻**Grants
 - ➤ Low cost long term loans
 - > Engagement with shareholder governments
 - > Engagement with development banks in LAC
- ➤ BR/US Biofuel and Aviation Protocols
 - ➤ Access to US and Brazilian funds and other support



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