



ICAO

UNITING AVIATION

E-GAP



# GOL Strategic Program for Decarbonized Operations

Montreal | September, 2015



# Strategic Decarbonizing Program



- CNG of our operations as a strategic target for 2022-2025
- Highly integrated *multifeedstock*, *multiprocess* value chains for green diesel, biojetfuel, renewable chemicals based on regional biodiversity and local partnerships
- Sustainable regional development, inclusion of Family Farmers and agribusiness
- Open to offtake agreements, with pre established conditions
- Working towards a National Act for Biojetfuel. No mandate.

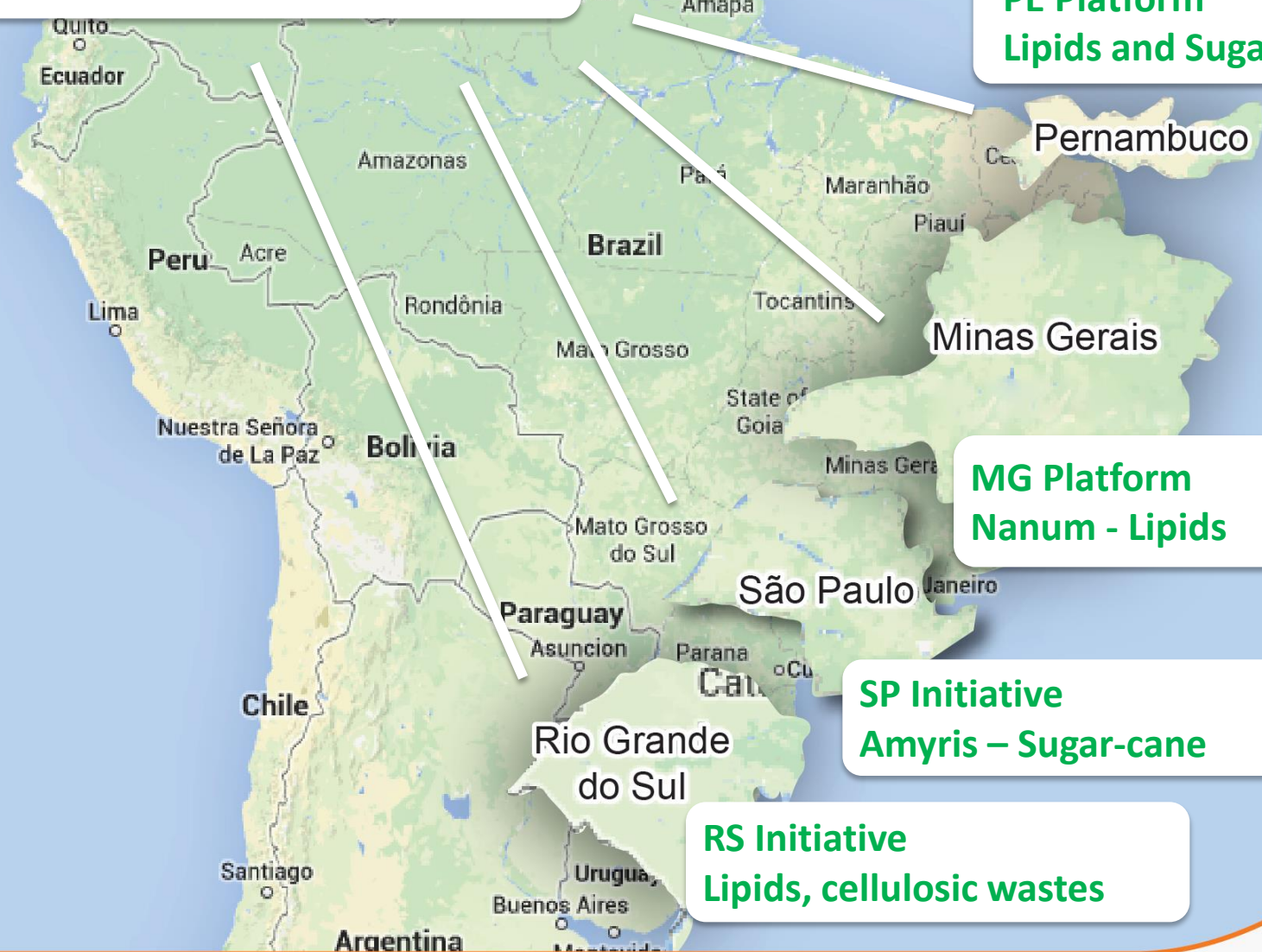
# GOL pillars for Biokerosene

- ASTM & ANP certification
- Sustainability certification (RSB)
- Cost compatible to fossil fuel





# Brazilian Biojetfuel Platform



# Plataforma Mineira de Bioquerosene

Lipids processing: Macaúba, UCO, animal fat, soya. Future: Camelina and Jatropha.

# Plataforma Pernambucana de Bioquerosene

Sugar and lipids processing: Sugar cane, Macaíba and UCO. Future: halophytes.

## Common concept

- From “farm to fly” concept
- Family farming, extractivism and agribusiness
- Reforestation program of degraded lands, legal reserves and permanent protection areas using native oil bearing Macaúba / Macaíba, integrated to Brazilian INDC – COP21 reforestation target of 12 million hectares
- Renewable energy, mitigate climate change, social inclusion
- Public and private partnership and direct agreements between partners
- High integration: regional biomass and logistics to optimize cost.
- High *yield conversion technology*, flexible and scalable

# Offtake Agreements



- Operational unit in Brotas (SP).
- Producing green diesel and biokerosene of sugar cane.
- Production capacity of 40,000 ton/year.
- ASTM certified (SIP) + ANP
- GOL e Amyris seeking for a comparable cost fossil fuel.
- MoU signed in October 2013.
- Working towards low carbon flights during Olympics 2016



- Nanum Nanotecnologia will develop a pilot plant of de 2,500 ton/year until 2018 for innovative thermal cracking technology.
- Commissioning plant of 25,000 ton/year until 2020 in Metro Belo Horizonte (MG).
- Lipids processing: Macaúba, UCO, animal fat, Soya, Camelina and Jatropha.
- Greasoline technology, spin-off of Fraunhofer UMSICHT.
- MoU signed in June 2015.

# Past, present and future



## Past relevant actions

- 2012/Jun First experimental flight during Rio+20
- 2013/Jun National resolution for biojetfuel (ANP 20)
- 2013/Aug Brazilian Biojetfuel Platform
- 2013/Oct First Brazilian commercial flight
- 2014/Jun Minas Gerais Biojetfuel Platform
- 2014/Jul Green World Cup: 360+ flights with biojetfuel
- Set/2014 First Brazilian international flight
- Aug/2015 Pernambuco Biojetfuel Platform

## Present

- Developing Minas Gerais and Pernambuco Platforms
- Low carbon flights to Fernando de Noronha Island Oct 2015
- Working towards a National Biojetfuel Act with Ubrabio

## Next steps

- Support the Reforestation program of Sao Francisco River Basin using Macaúba
- Structuring a continuous operation using Amyris SIP for the Olympic Games 2016
- Green hubs: BSB, REC, CNF





# Green World Cup video



Google it with this  
search keywords:

YouTube IDB  
green world cup



# GOL Partners

