

ICAO Workshop

Montreal - Canada



Biofuels

Mauro Iurk Rocha
Petrobras R&D Center – CENPES
February 10th , 2009

The presentation may contain forecasts about future events. Such forecasts merely reflect the expectations of the Company's management. Such terms as "anticipate", "believe", "expect", "forecast", "intend", "plan", "project", "seek", "should", along with similar or analogous expressions, are used to identify such forecasts. These predictions evidently involve risks and uncertainties, whether foreseen or not by the Company. Therefore, the future results of operations may differ from current expectations, and readers must not base their expectations exclusively on the information presented herein. The Company is not obliged to update the presentation/such forecasts in light of new information or future developments.

Cautionary Statement for US investors

The United States Securities and Exchange Commission permits oil and gas companies, in their filings with the SEC, to disclose only proved reserves that a company has demonstrated by actual production or conclusive formation tests to be economically and legally producible under existing economic and operating conditions. We use certain terms in this presentation, such as oil and gas resources, that the SEC's guidelines strictly prohibit us from including in filings with the SEC.

Agenda



- :: General View of Company**
- :: Brazilian Oil Products Market**
- :: Petrobras Investment Plan**
- :: Petrobras Biofuels S/A**
- :: Biodiesel**
- :: Ethanol**
- :: R&D Biofuels**
- :: Final Comments**

General View of Company

An integrated energy company



Exploration and Production



Refining, Transportation and Trading



Distribution



Natural Gas and Biofuels



Power Generation



Petrochemical

Petrobras in the World



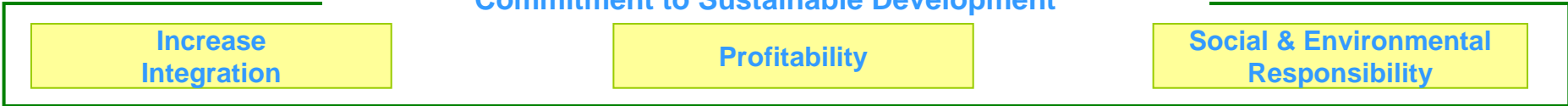
HEAD OFFICE	MARKETING	GAS AND ENERGY
DOWNSTREAM	E&P	AGENCIES

Focused in Latin America and Atlantic Basin

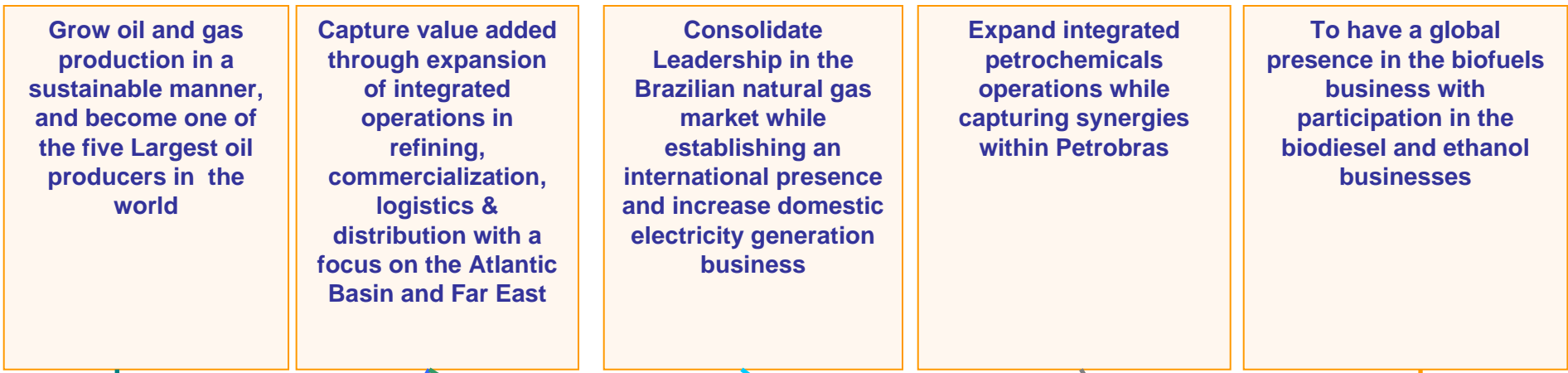
Corporate Strategy

A VISION FOR INTEGRATED GROWTH TO 2020...

Commitment to Sustainable Development



Expand operations in target markets for oil, oil products, petrochemicals, gas and energy, biofuels and distribution and to be recognized as a model integrated energy company

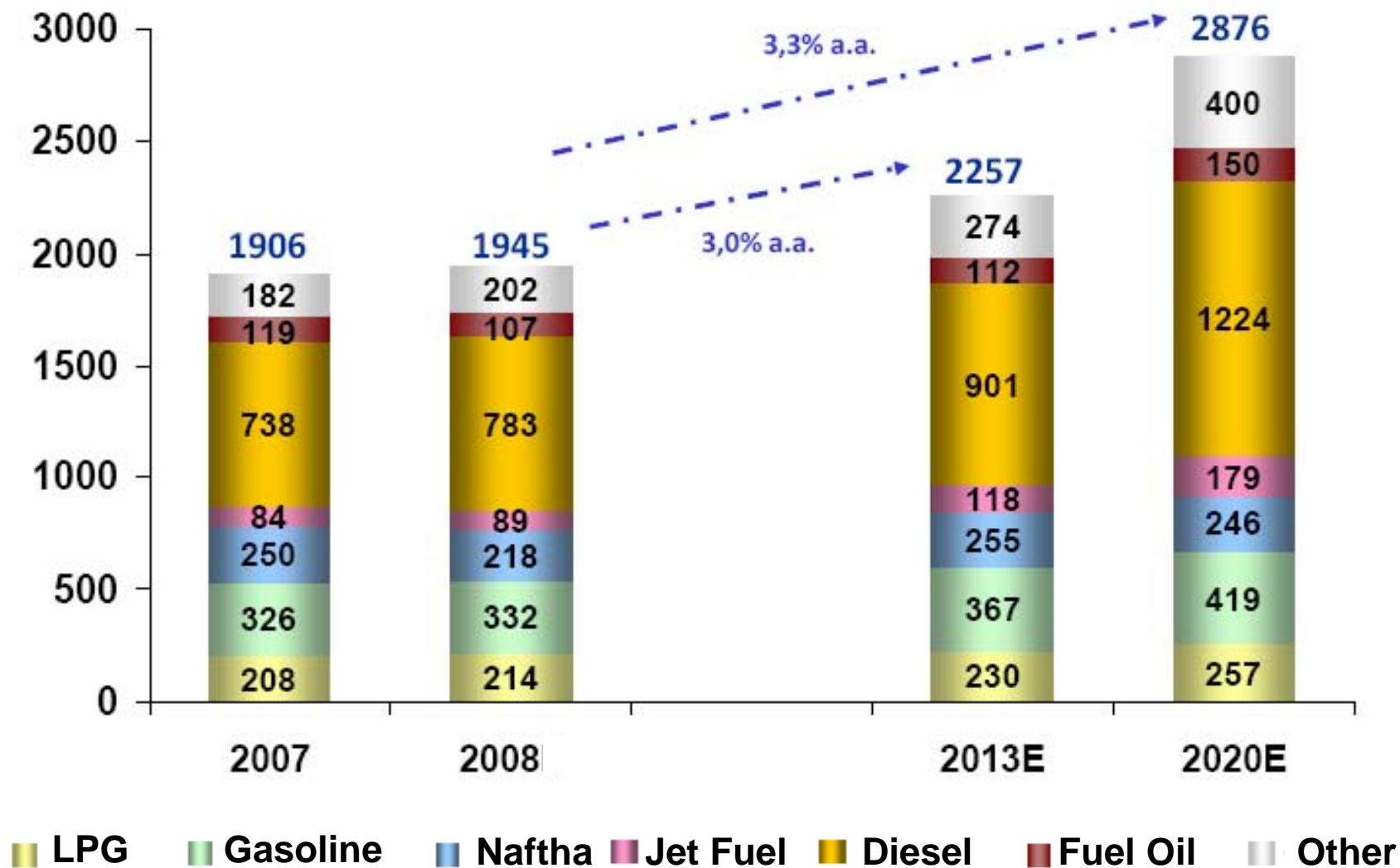


Operational, management, human resources and technological excellence



Brazilian Oil Products Market

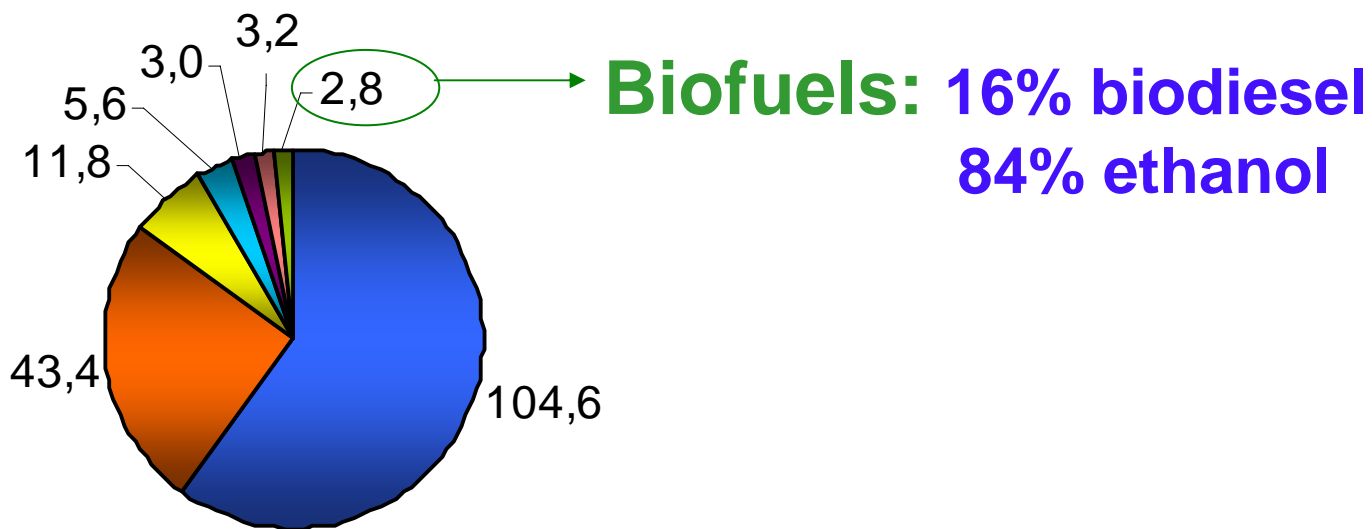
1,000 bbl/d



Petrobras Investment Plan

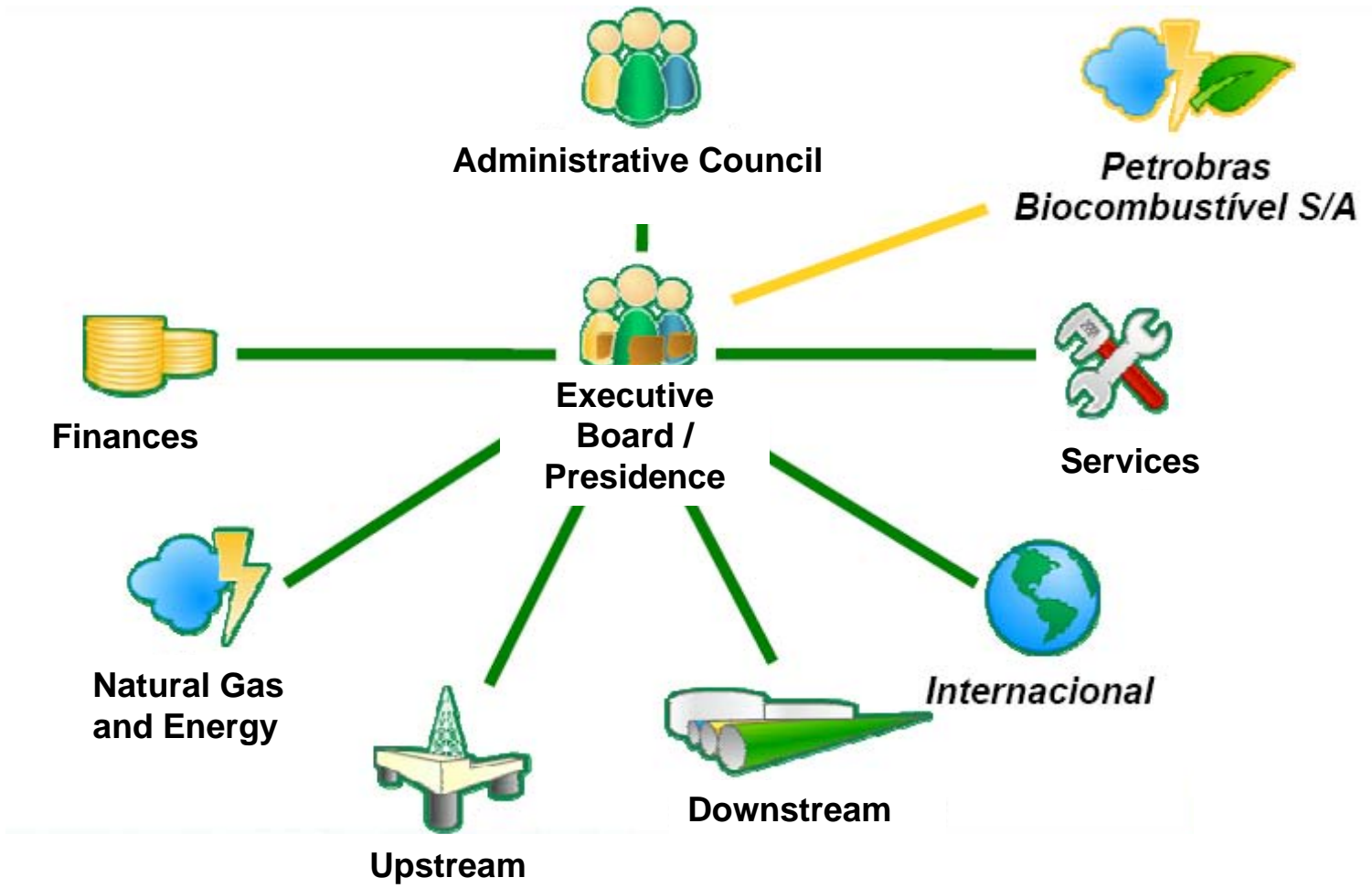
2009 - 2013

US\$ 174.4 billion



- Upstream
- Downstream
- G&E
- Petrochemical
- Distribution
- Corporate
- Biofuels

Petrobras Biofuels S/A



Law 11.097/2005 – allowable and mandatory percentages of biodiesel for diesel blending

Since July 1st 2008: B3

- **First phase of program:**
Implementation of 3 biodiesel units in Northeast region and Brazilian semiarid
- **Production Route: FAME**
- **Oleaginous species considered:**
soybean, cotton, palm oil and tallow
- **Multi-feedstock units producing 171,000 m³/ year**
- **Other phases: production units to be installed in other regions**
- **Partnerships are being studied to implement other units**



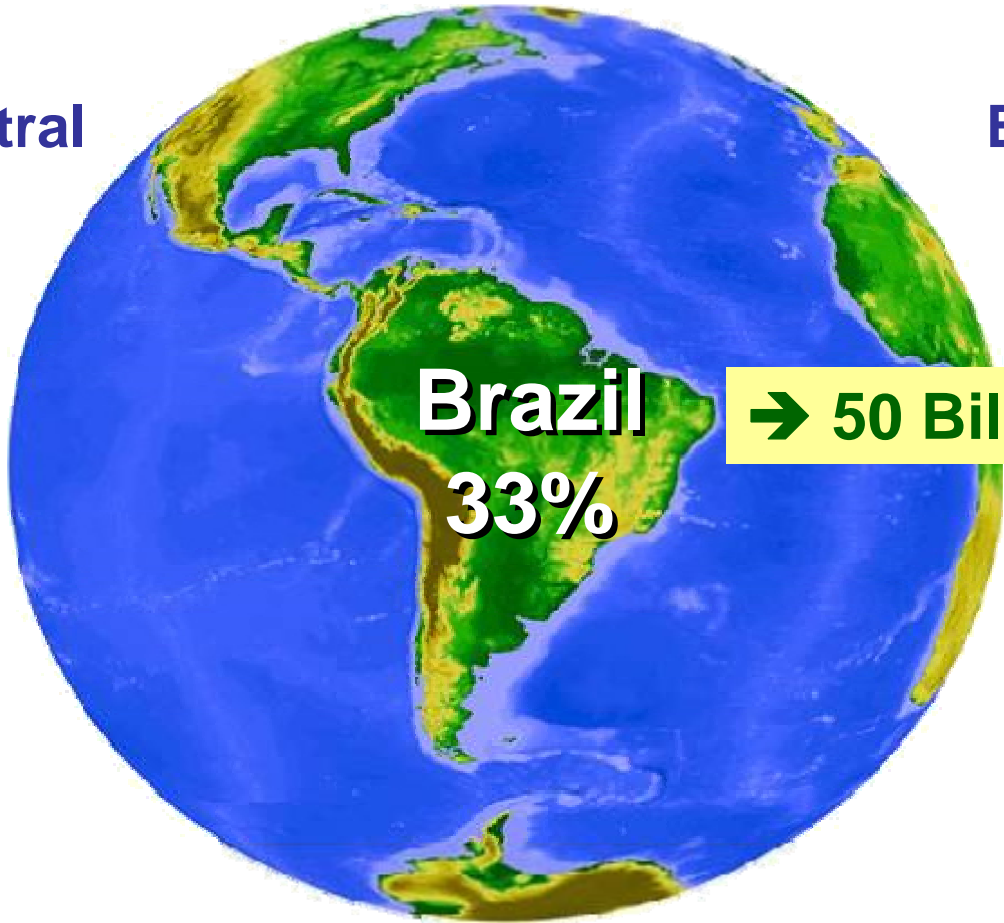
Ethanol

North and Central America
39%

Europe
10%

South America
34%

Asia
17%



Brazil
33%

→ 50 Billion Liters

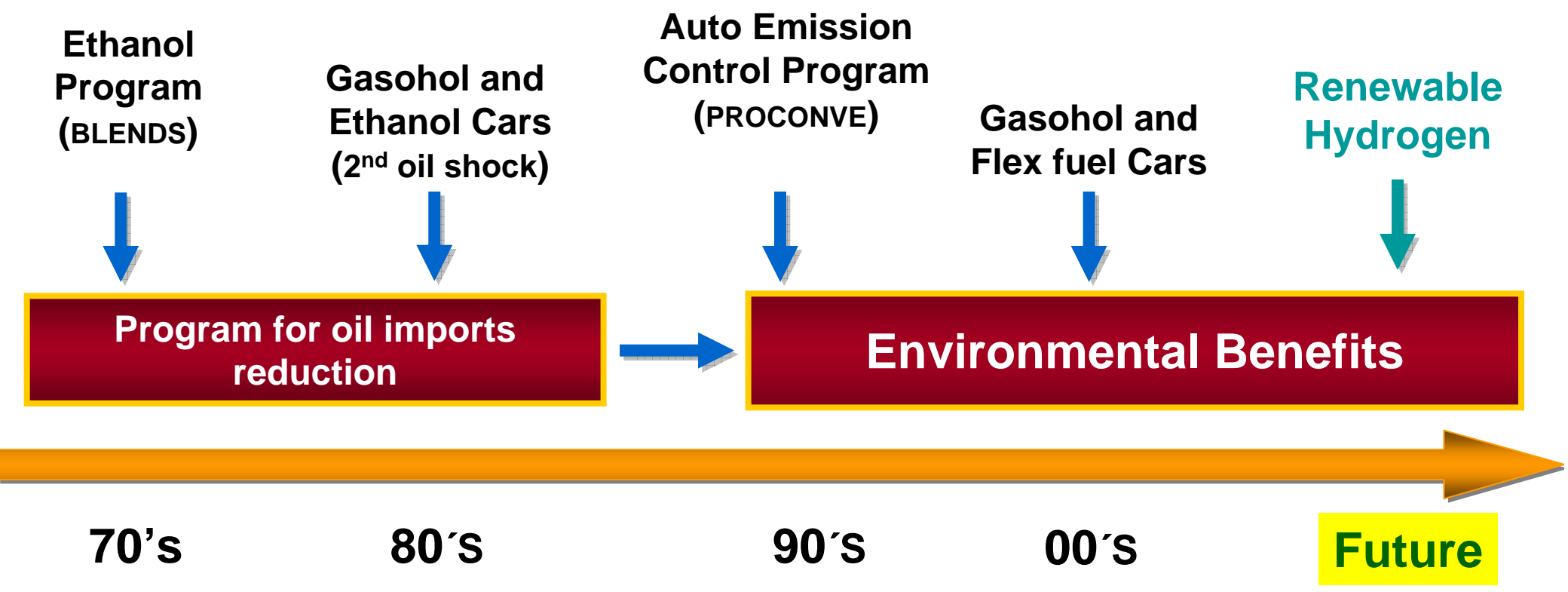
More than 70% of all ethanol is produced by Brazil and USA

Brazilian exportation in 2006: 3.3 billion liters

Source: F.O.Licht

Production in 2006

Fuel Ethanol Program Evolution



Consumer decides the fuel at the gas station.

Fuel price is one of the most important factors.

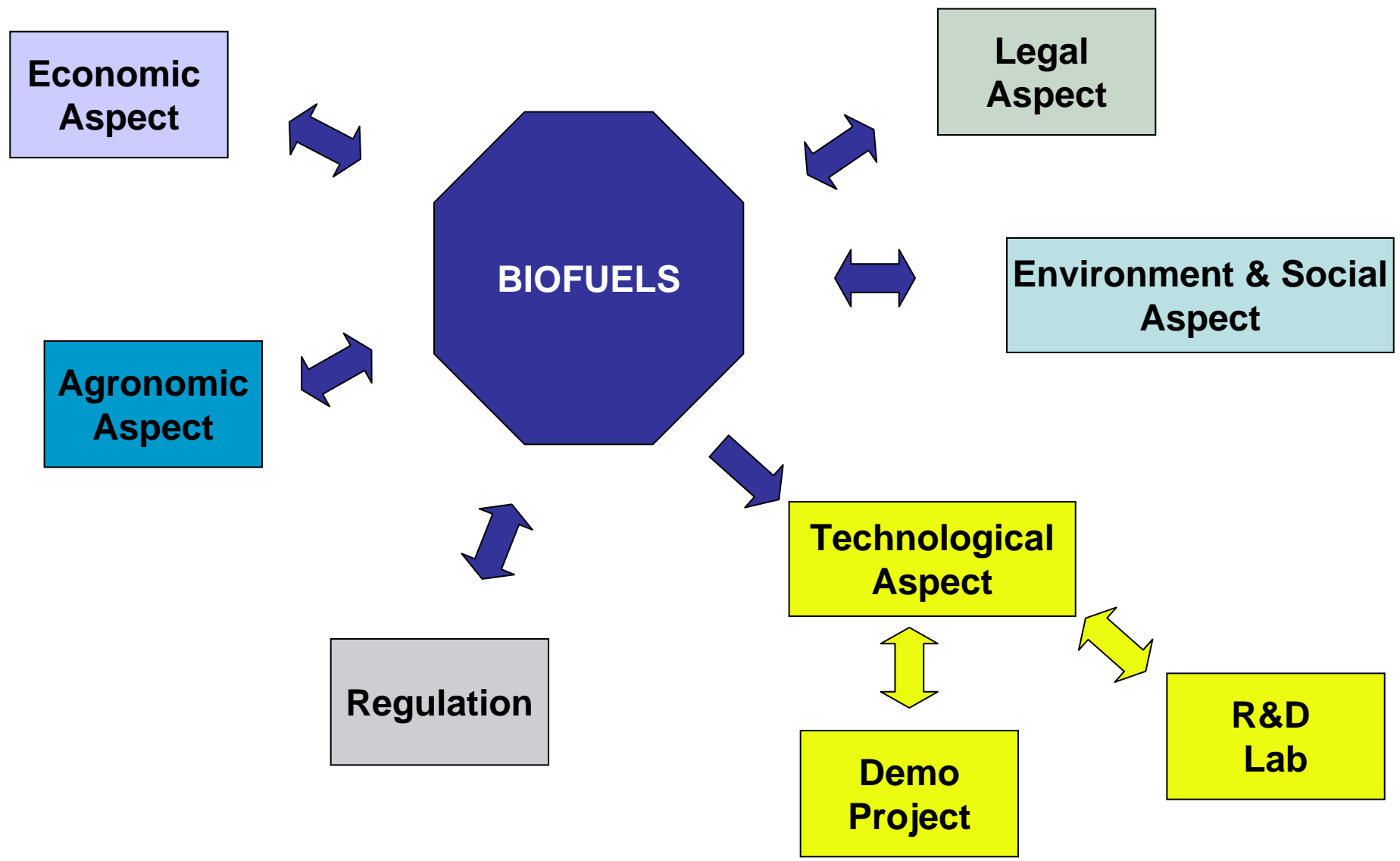
Consumer is aware of pollution and renewable fuels.

In november 2008, FFV represented **87,3%** of new light vehicles licensing.

More than 6,78 million vehicles since 2003 → **28%** of current light vehicle fleet.



Biofuels Development





R&D Biofuels Projects

Biodiesel

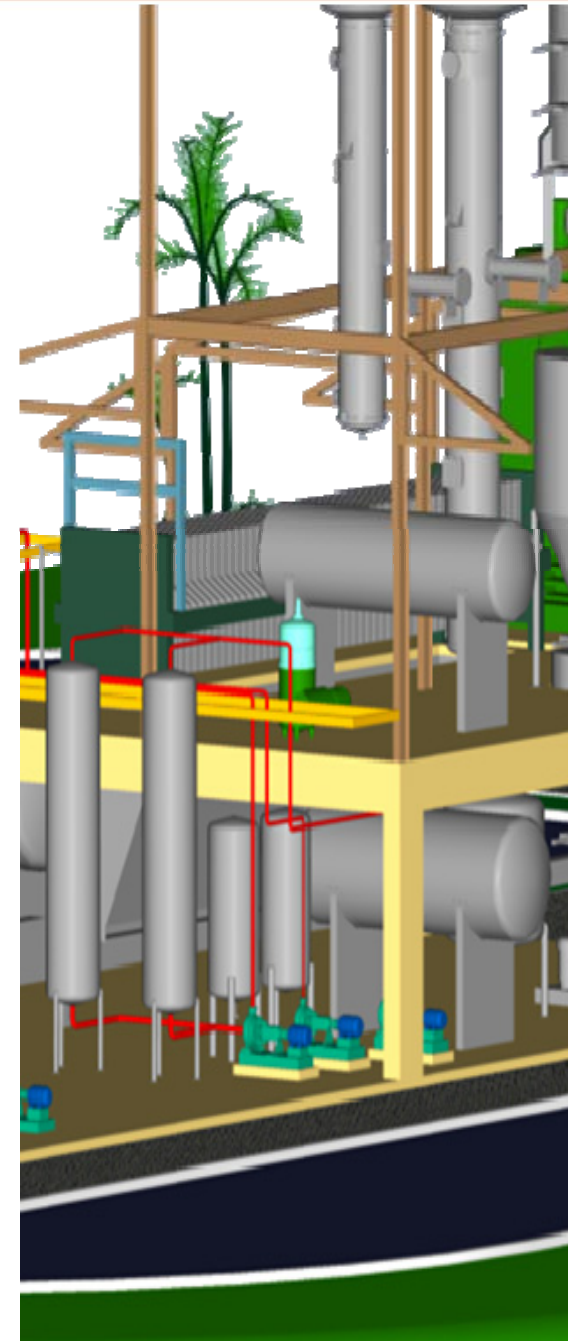
HBIO

- Vegetable / animal oil hydrogenation

2nd Generation bioethanol

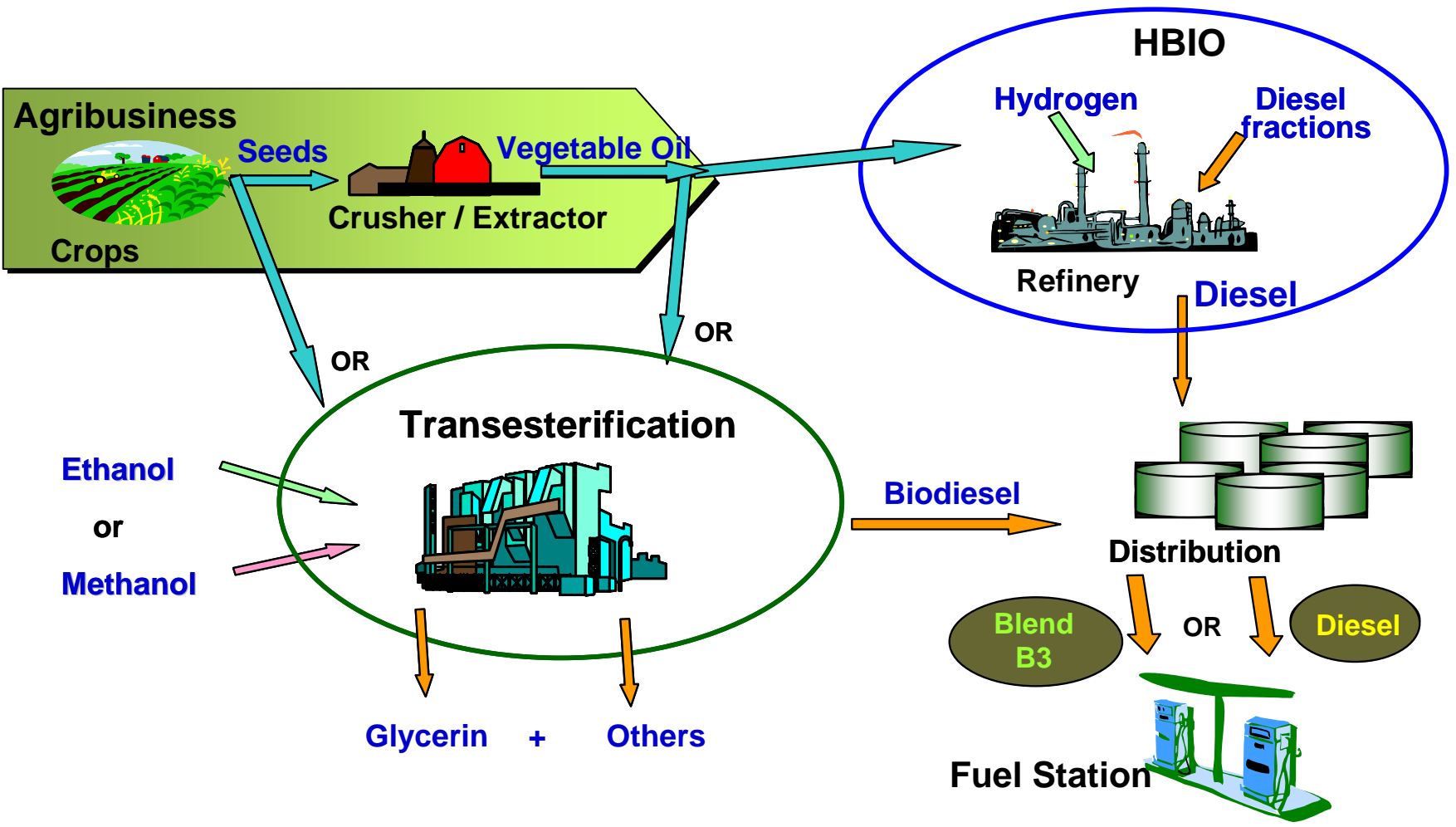
- Lignocellulosic bioethanol

Biojet



HBIO and Biodiesel – Complementary Processes

HBIO is a hydrogenation of blends of diesel and vegetable oils taking advantage of **existing HDT units** in order to produce **diesel oil**.



Raw material: sugar cane bagasse

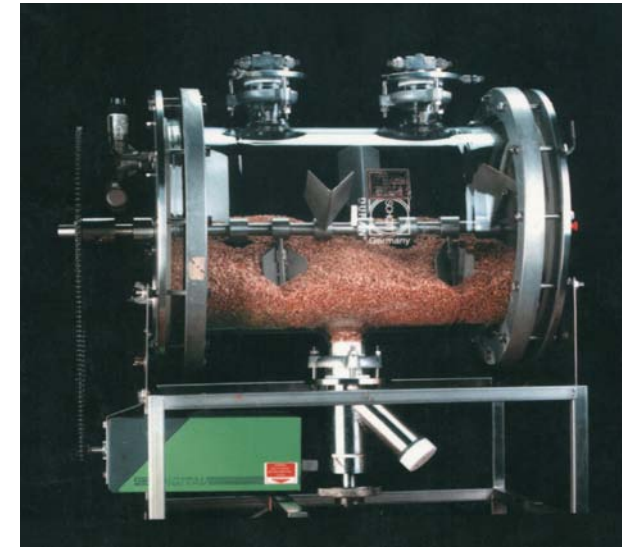
Proprietary process

Successful ongoing bench-scale experiments

- ✓ Patent issued
- ✓ End of tests: 4thQ 2006

Pilot plant since : 1stQ 2008

Demonstration plant start-up: 3rdQ 2010



Short term

2nd Generation Biojet by Transesterification plus extra process

Concept : “dropped in” without any changes to existing engine or airframe technology

Process Selection and Evaluation

Feedstock selection - Sustainable grow biomass

Yields , Cold flow properties

Thermal Stability, Others ...



Medium term

Hydrotreating

Process parameters evaluation

Final Comments

- ▶ **As an integrated energy company, Petrobras shall have an important role in the alternative fuels market development, looking for the best sustainable solutions.**
- ▶ **Petrobras shall contribute to achieve the target of 10% alternative aviation fuel by 2017 proposed by IATA on Aviation & Environment Summit in 2008.**





BR PETROBRAS



www.petrobras.com.br