

Ethanol in Brazil:
a successful experience to be shared

Ministry of Agriculture, Livestock and Food Supply
**Ministry of Development, Industry and International
Trade**

Ministry of Mines and Energy

Ministry of Finance

The World Bank, Washington - March, 2006

Economic Agents of Sugar Cane Industry

Sugar Cane Agriculture Phase

- 50 thousand sugar cane growers



Sugar and Alcohol Industrial Phase

- 346 Industrial Plants



Regulatory Domain: Ministry of Agriculture

Regulatory Domain: Ministry of Mines and Energy / ANP (National Petroleum Agency)

Gas Stations

- 32,030 Gas Stations sell alcohol. (92% of total gas stations in Brazil)
- Mercado de Preços Livres



Exporters

- 2.38 Billion liters exported in 2004



Fuel Distributors

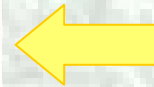
- 160 Operating Distributors
- Only distributors may blend ethanol with motor gasoline



ETHANOL FUEL HISTORY IN BRAZIL



Use of ethanol: 80 years of experience



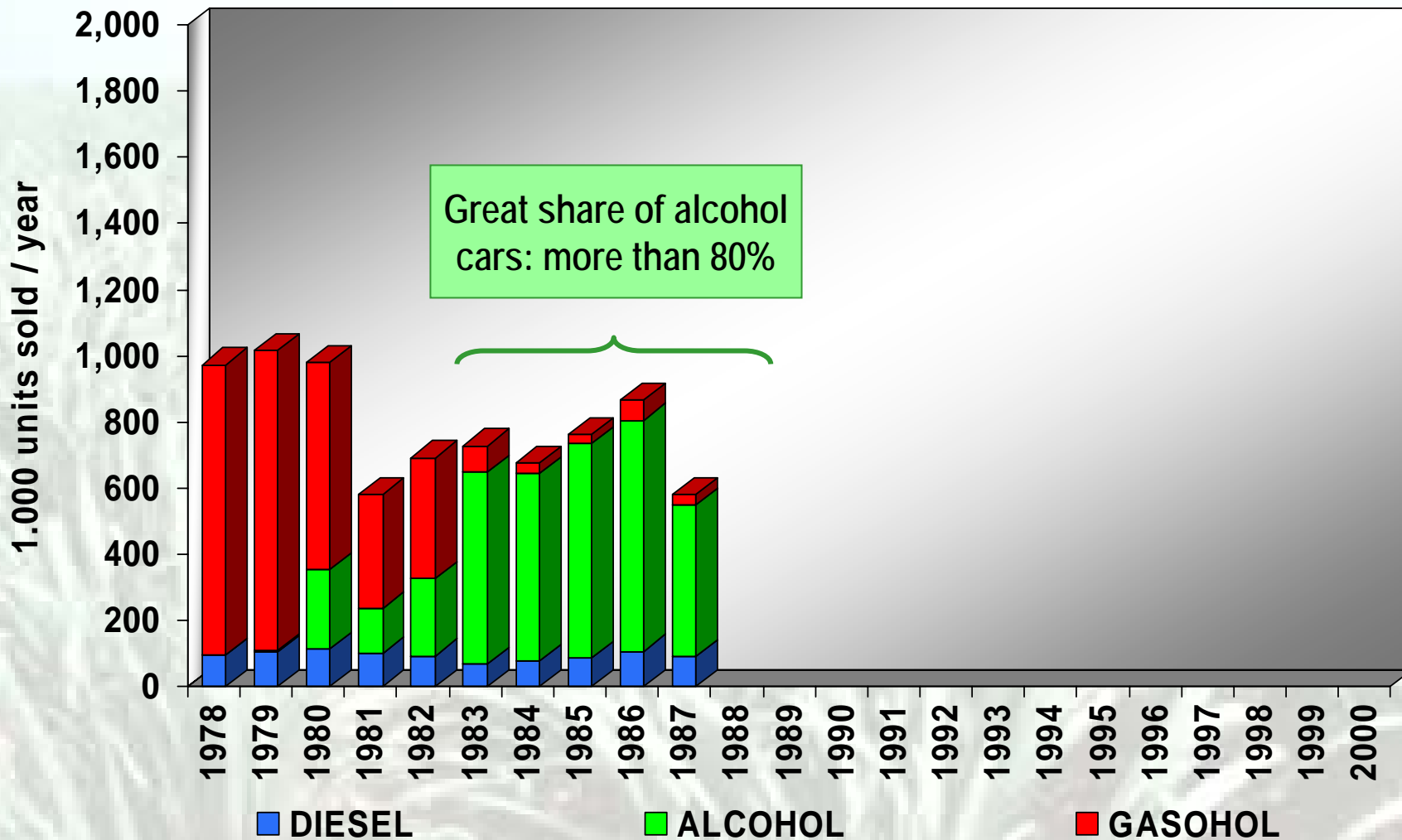
First tests using ethanol blended to gasoline



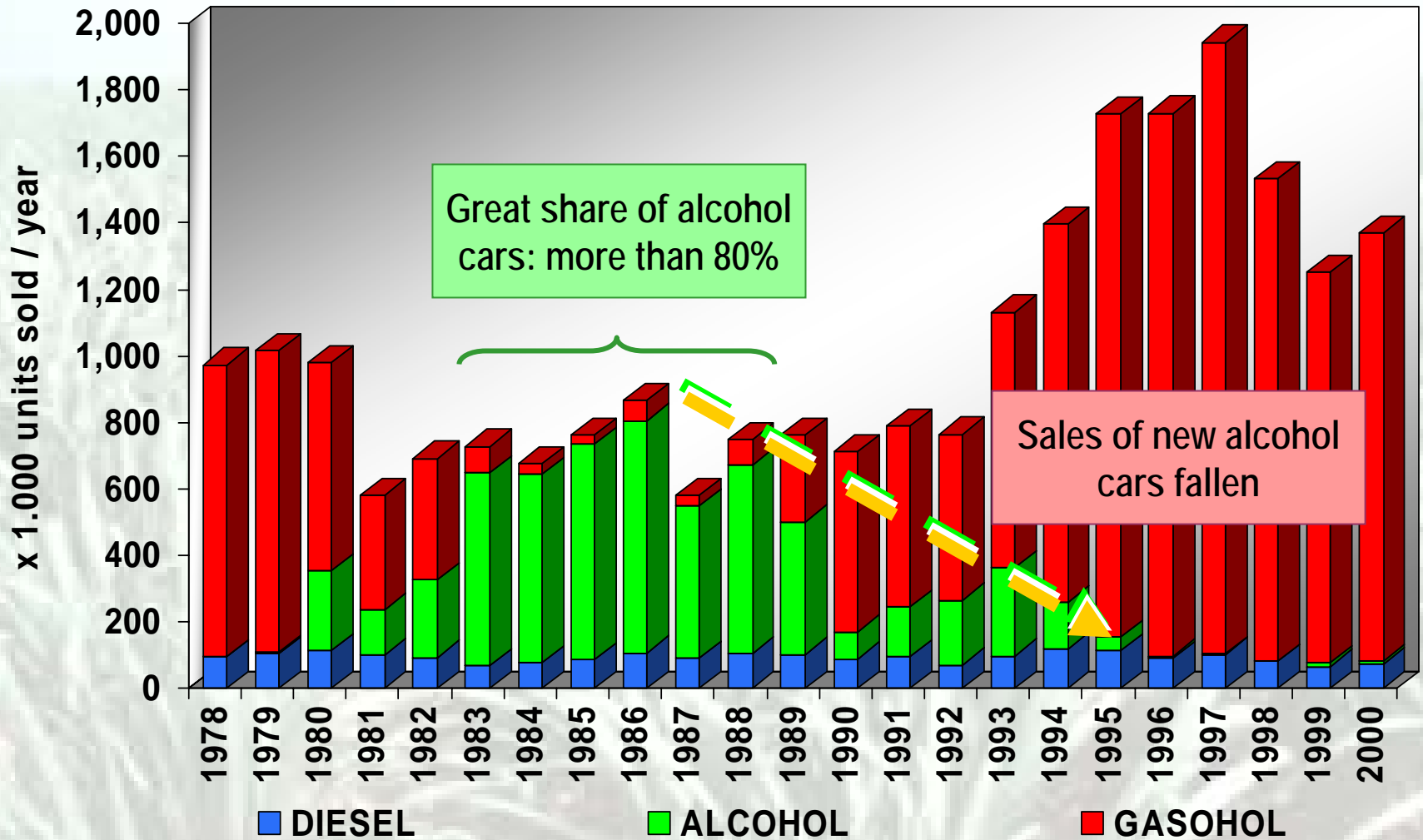
1979: vehicle's manufacturers started

selling 100% hydrous alcohol cars

Brazilian Automotive Market by Fuel Kind



Brazilian Automotive Market by Fuel Kind



Brazilian Experience: nowadays...

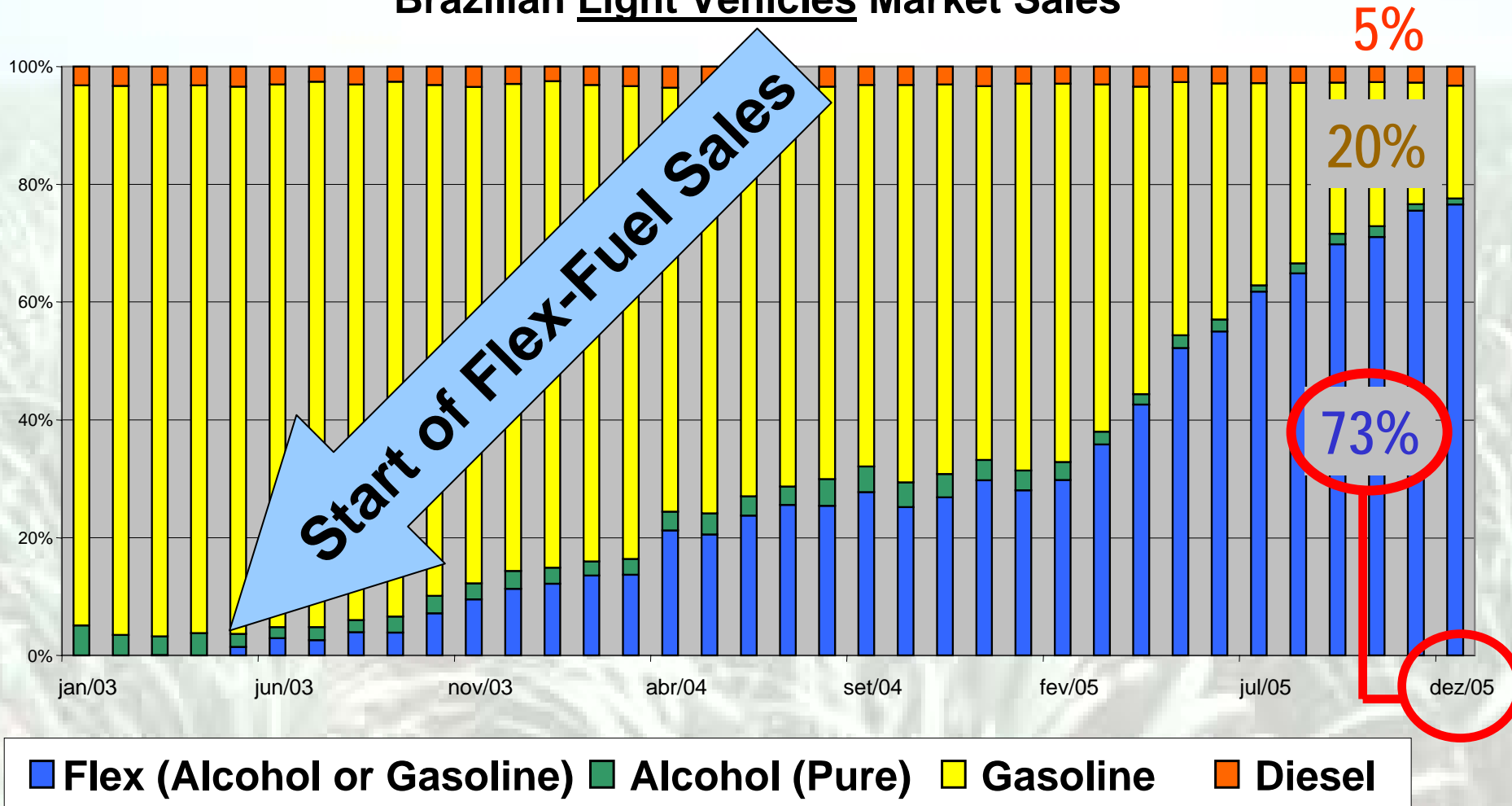


1) Since 2003, 31 new models of Flex-Fuel Vehicles, by seven automakers: it can use any mixture of gasoline and alcohol, from 0 to 100%, without any action of car driver.

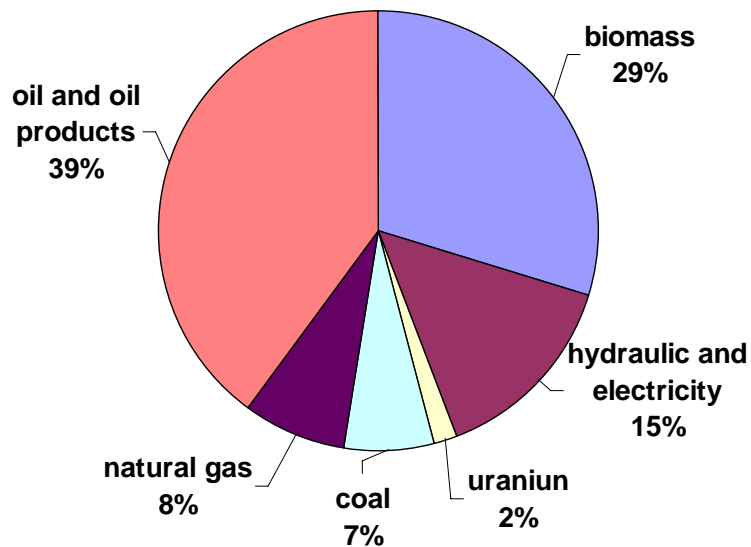
2) In December 2005, Flex Fuel vehicles sales represented 73% of total light vehicles sold (2003-2005: 1,245,201 units).

Nowadays: Brazilian Automotive Market by Fuel Kind

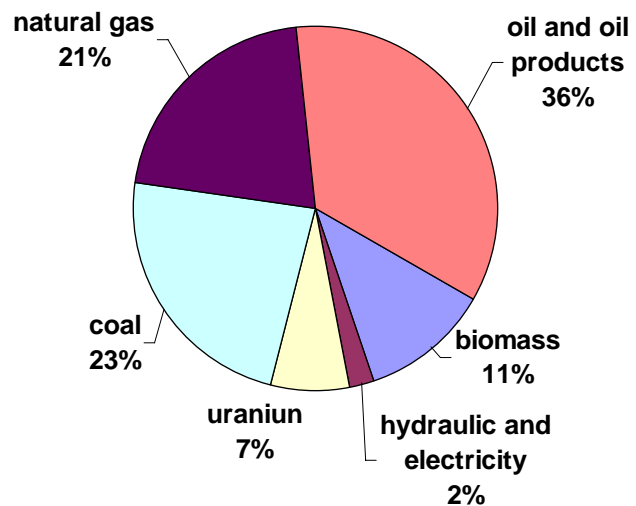
Brazilian Light Vehicles Market Sales



BRAZILIAN ENERGY MIX

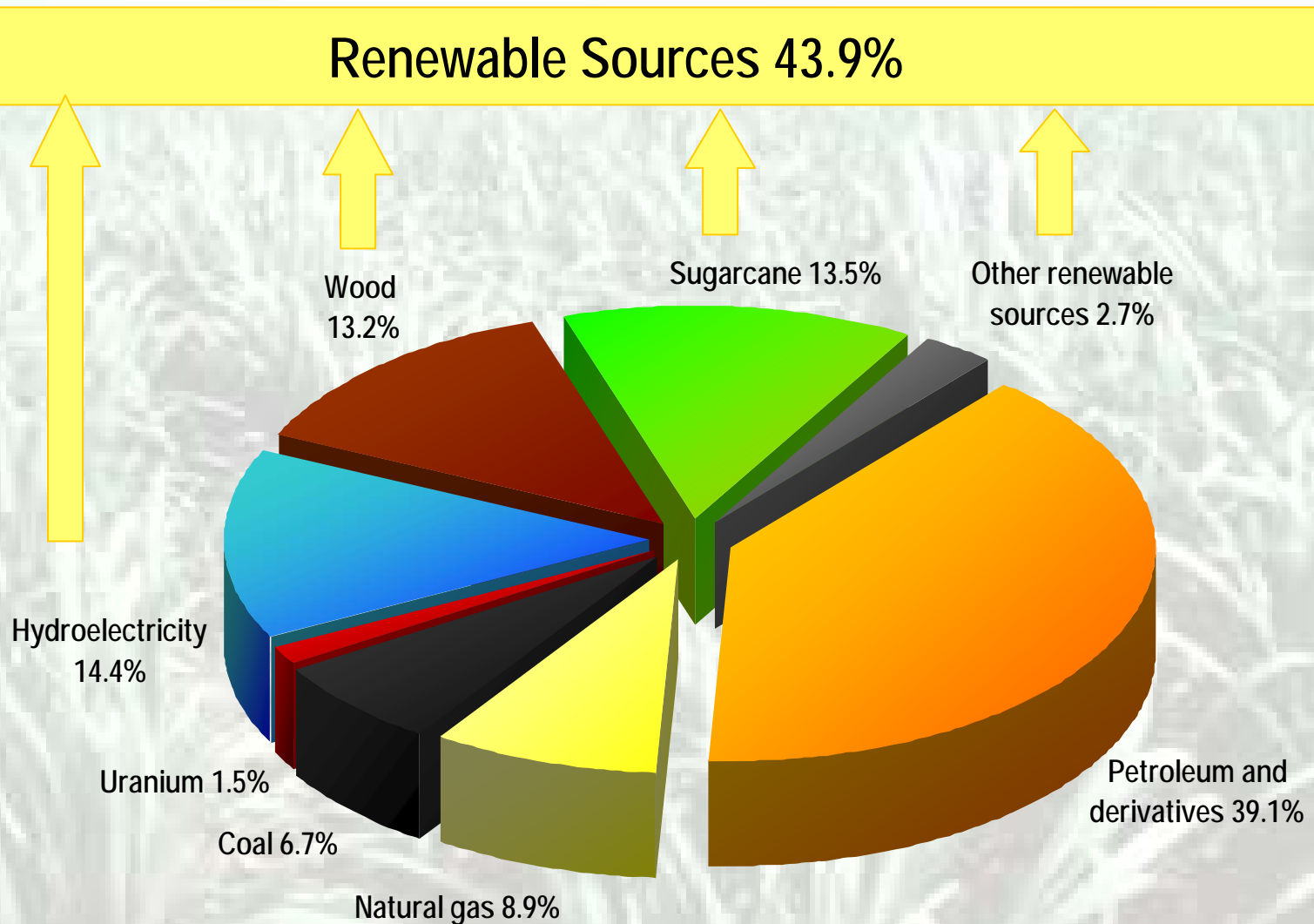


WORLD ENERGY MIX



Fonte: MME/BEN (2005)

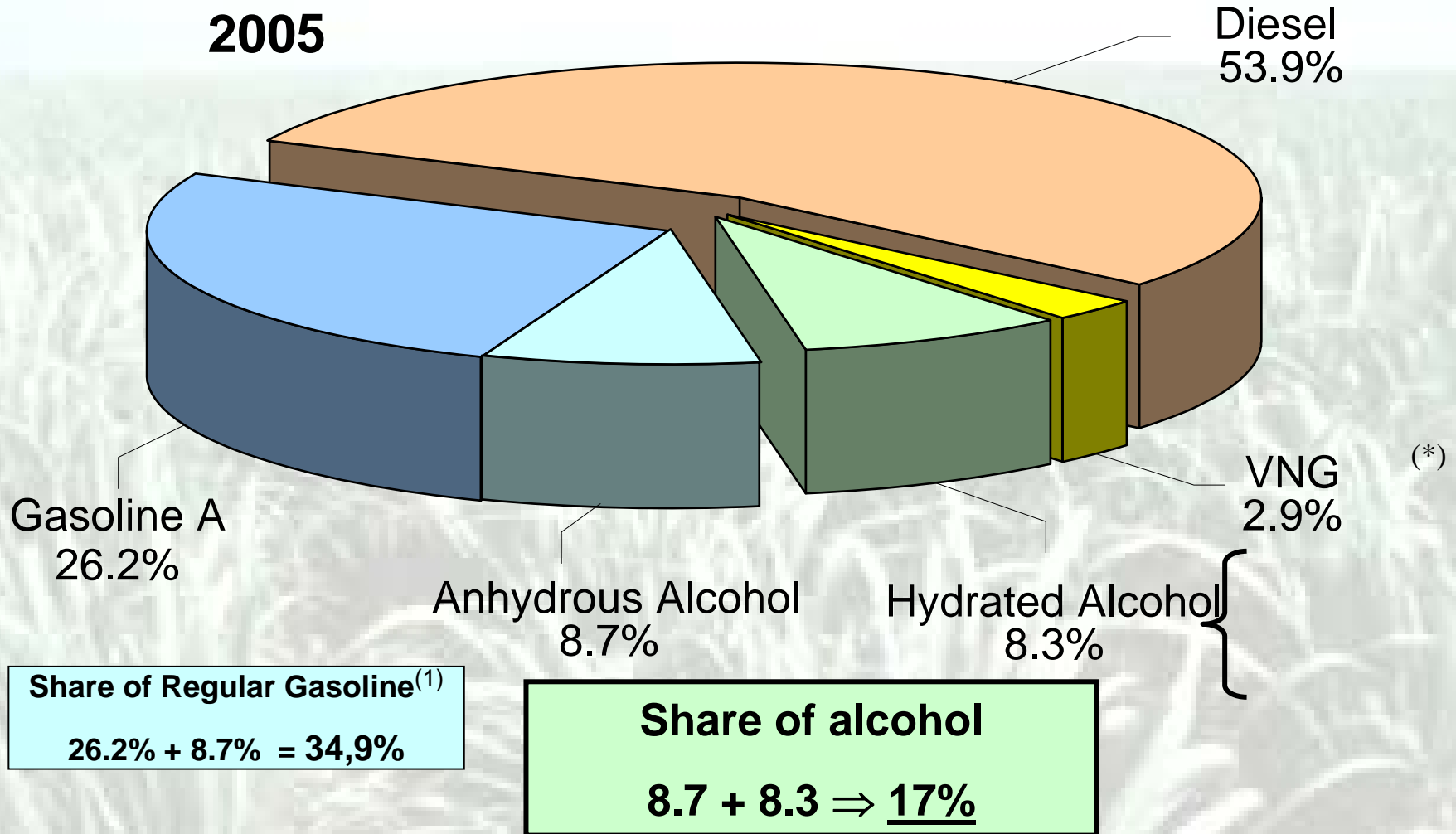
Brazilian energetic matrix - 2005



100% = 213.4 millions [toe]

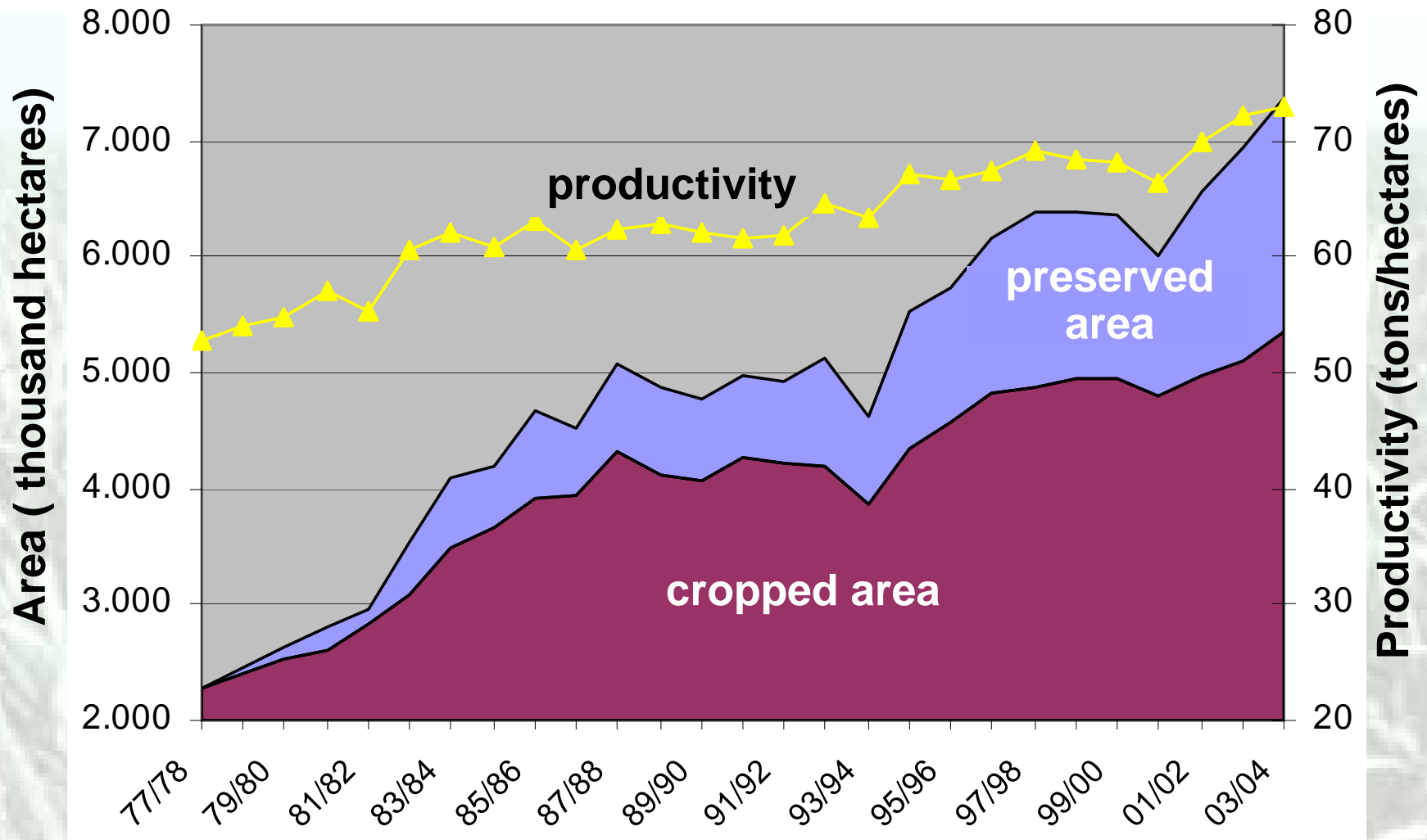
Source: Brazilian Energy Balance (2005)

Current Matrix of Vehicle Fuels

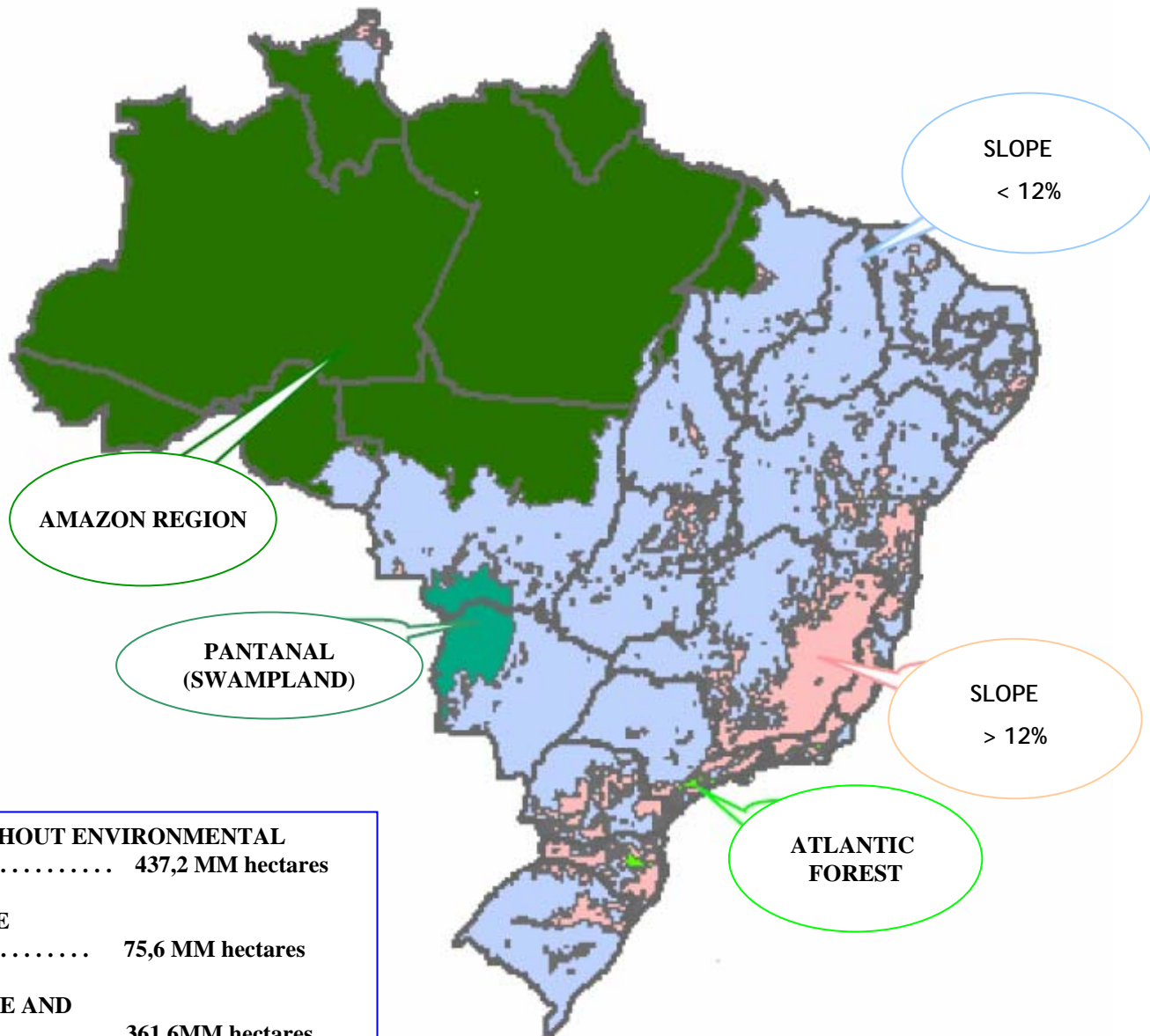


(1) The gasoline available in Brazilian Gas Stations is added with 25% of alcohol.

Sugarcane: Cropped and Preserved Areas due to Technological Improvements



1 ton of sugarcane = 80 liters of alcohol
1 hectare of sugarcane = 6 m³ of alcohol



Land Classification in Brazil

Why BIOFUELS?

➤ Environmental gains

- carbon sequestration
- lower emission levels in consumption

➤ Renewability

- short production cycle
- man-controlled process

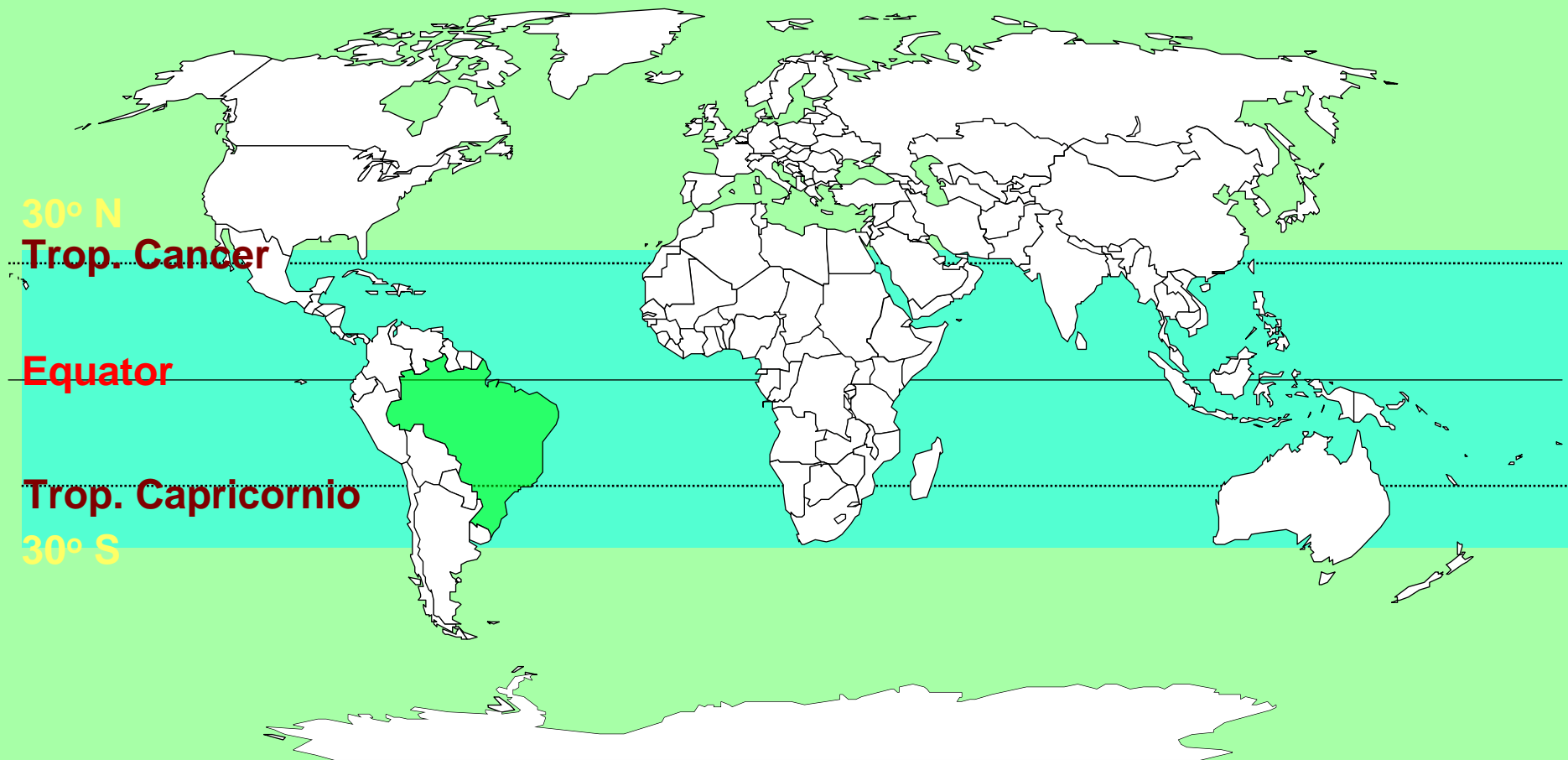
➤ Economic aspects

- new demand component
- impacts on trade balance

➤ Social aspects

- jobs creation
- income distribution

Biofuels can be considered an excellent opportunity to the tropical countries...



Some basic statements (1/2):

- **Energy supply is a great challenge to all the Developing Countries;**
- **Reducing the oil dependence is a need for most of them;**
- **Biofuels can be important to address those problems;**
- **Brazilian experience can be helpfull.**

Some basic statements (2/2):

- Brazil is the lowest cost producer of sugar and ethanol;
- But the highest agricultural yields are in Ethiopia and Colombia;
- Other countries able to grow sugar cane competitively could also become low cost producers of sugar and ethanol;
- It is possible to combine agricultural aptitude with high technology and management in other countries, besides Brazil.

Why starting a biofuels program with ethanol?

- It is easy to be produced in large scale;
- It is much cheaper than biodiesel;
- It is perfectly miscible with gasoline;
- within appropriate limits, no change in car engines is needed;
- It allows expressive environmental gains.

Why choosing sugar cane?

- It allows the highest productivity (liters/hectare);
- It has exceptional thermal and environmental balances;
- It allows an increase in the competitiveness of the mills (higher quality and lower costs of sugar);
- It gives some flexibility to the mill;
- It leads to an increase in agricultural yield (industrial residues transformed in fertilizers).

How to start a program of producing ethanol?

- Identifying potential areas (available raw material);
- Considering technical and economic questions;
- Developing a local basic equipments industry;
- Finding the technologies more appropriated to each case (specially in terms of scale);
- Investing in the best projects;

How to start a program of blending ethanol with gasoline?

- **Infrastructure installations and logistic;**
- **Technical and formal questions;**
- **Economic and fiscal questions;**
- **Instruments for supply guaranty;**
- **Consumer reaction.**

How we can help: Agricultural Aspects

- **Information on sugar cane varieties, data bank:** (Centro de Tecnologia Canavieira, Instituto Agronomico de Campinas, Universidade Federal de Sao Carlos);
- **Technical support for sugar production:** Organizacao dos Plantadores de Cana de Sao Paulo (ORPLANA), Cooperativa de Produtores da Regiao de Ribeirao Preto, and other consultants.

How we can help: Industrial Aspects

- **Technical packages for both the production of ethanol and sugar, integrated with electricity cogeneration: Federation of Industries of Sao Paulo State (FIESP);**
- **Financing of equipment by Brazilian exporters by BNDES – Brazilian development bank (Libor + 2%, 12-year loan).**

How we can help: Ethanol Consumption

- **Information on blending: stock and transport logistics, specifications – Petrobras;**
- **Technical information for vehicles: appropriate fuel blends depending on engine technology – Brazilian Association of Manufacturers of Auto Vehicles (Anfavea).**

How we can help: Regulatory and Fiscal Aspects

- **Agricultural policy – Ministry of Agriculture;**
- **Taxation and fiscal policy – Ministry of Finance;**
- **Energy policy and fuel quality – Ministry of Mines & Energy;**
- **Trade policy and industrial cooperation – Ministry of Development, Industry & International Trade.**

Conclusions:

- Ethanol can be an excellent business for tropical countries, especially the traditional sugar cane producers;
- Producing and blending ethanol with gasoline are simple tasks, if all the process is carefully planned;
- Brazil learned with its own mistakes. Other countries don't have to do the same;
- Brazil is interested in sharing its experience because it needs the help of other suppliers to organize the international market.

Thank you!

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