



BIOFUELS IN BRAZIL

December/2010

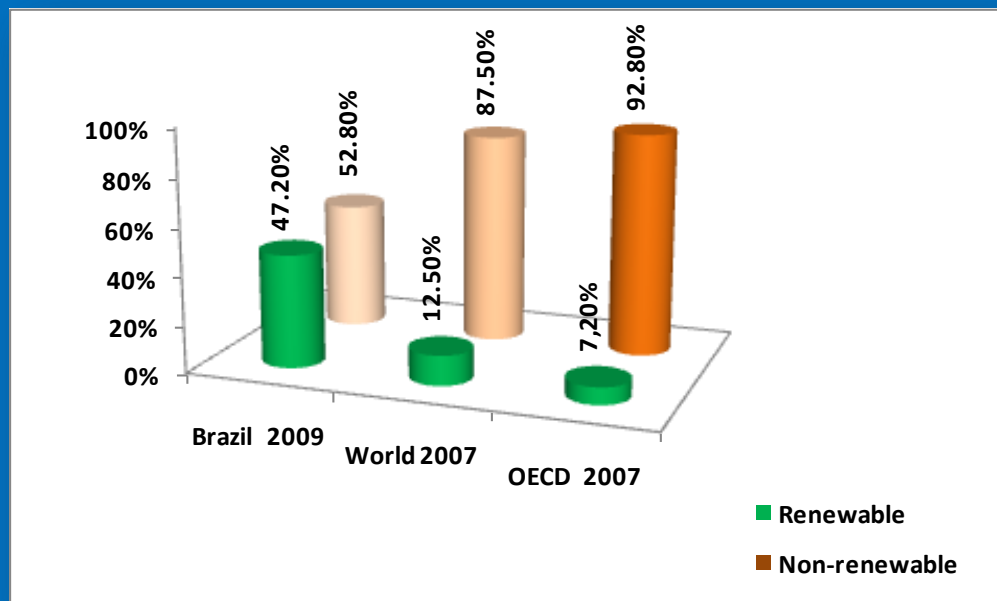


Renewable and non Renewable - Profile

Brazil:

World reference in the use of renewable energy.

- ✓ Energy security (independence);
- ✓ Environmental factors: climate change mitigation;
- ✓ Exploitation of hydropower potential;
- ✓ Strengthening agriculture (use of biomass).



Energy Demand by Energy Source

Brazil has numerous sources to increase its energy supply, relying on diversity and availability of natural resources, which can be used as fuel or for electric power generation.

This diversification of sources tends to increase according to the projections the of the National Energy Plan 2030 (PNE 2030).



Biofuel

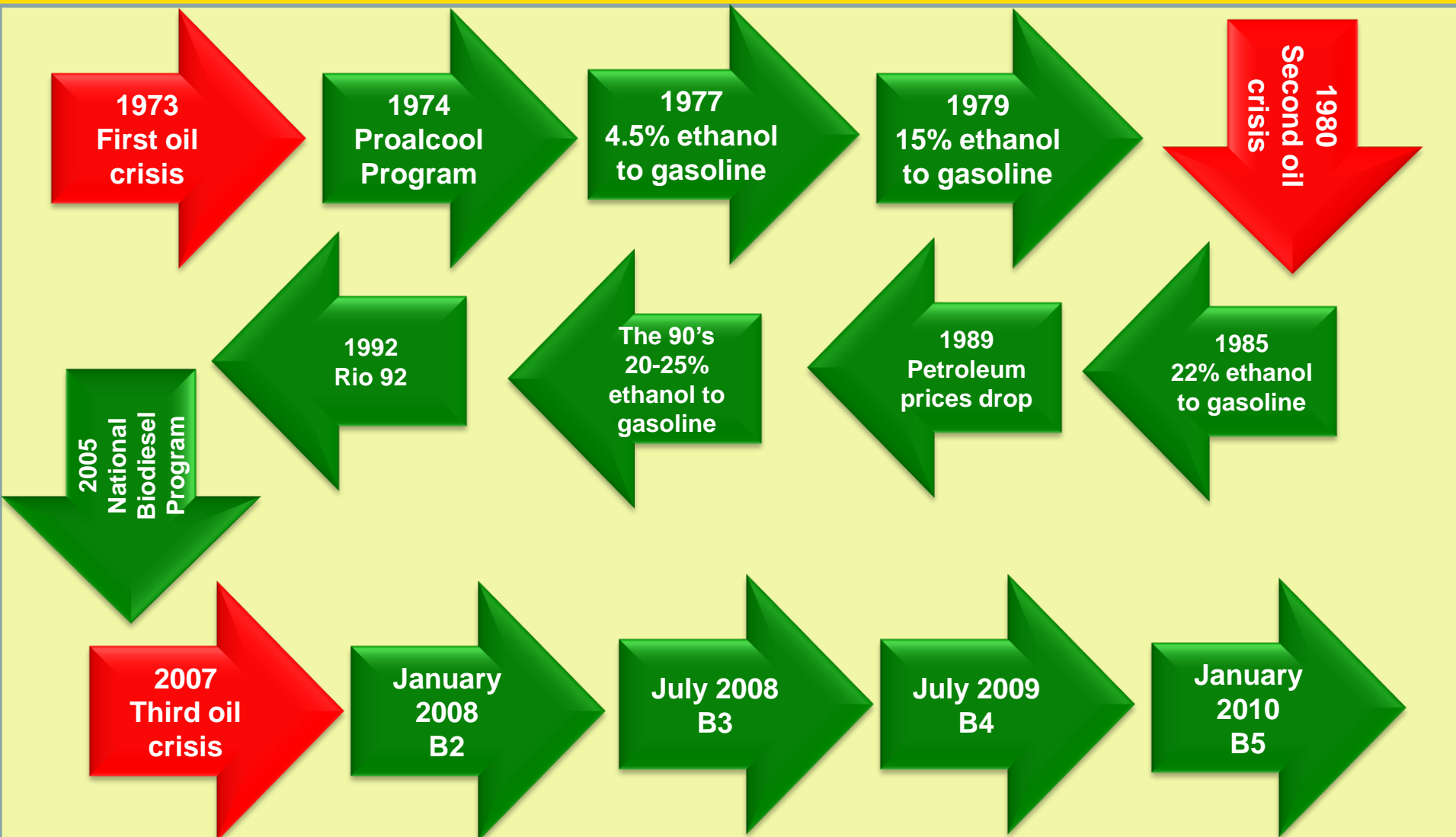
A fuel produced from renewable biomass for use in internal combustion engines or, in accordance with regulations, for other types of energy generation, that could partially or totally replace fossil fuels, (Law 11,097/2005)

From vegetable or animal biomass, they enable the development of agribusiness, family agriculture and job opportunities. Besides being renewable, they reduce emission of greenhouse effect gases. The gases produced during combustion are absorbed during the growth period of the plant.



Biofuels

Brazil's Historical Evolution



Production & International Market Brazilian Fuels, 2009

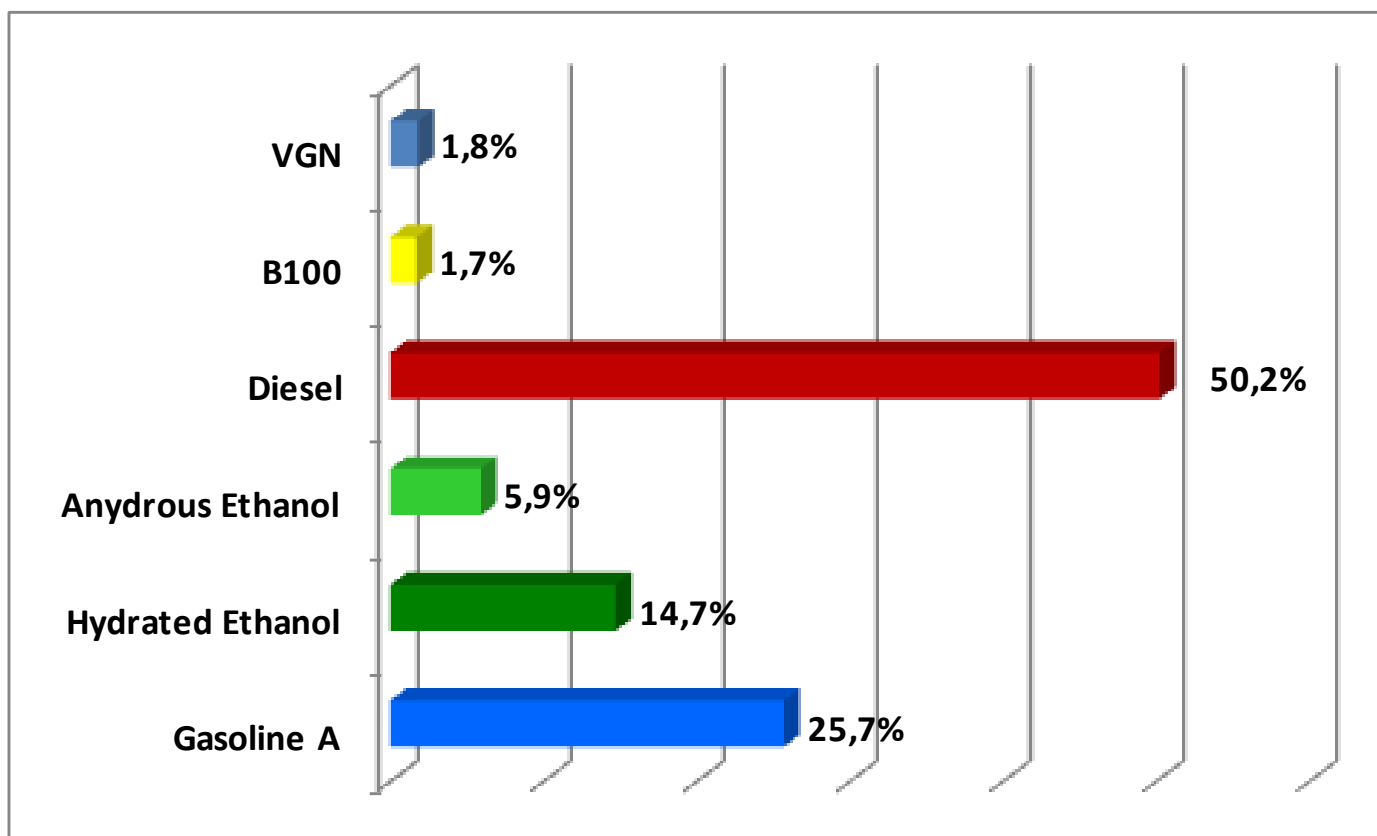
FUEL	Production mil m ³	Imports mil m ³	Exports mil m ³	Imports % demand	Exports % production
GASOLINE A	19,774	-	2.513		13%
DIESEL	42,444	3.515	1.221	5%	
ETHANOL	25,373	-	3.296		13%
LPG	7857	2.557	20	21%	

Dependency

Self-Sufficiency

Renewable Participation

Brazilian Transportation Matrix - 2009



Total Ethanol – 20,9%

Source: ANP/SIMP

Ethanol

422 Ethanol Plants registered at ANP

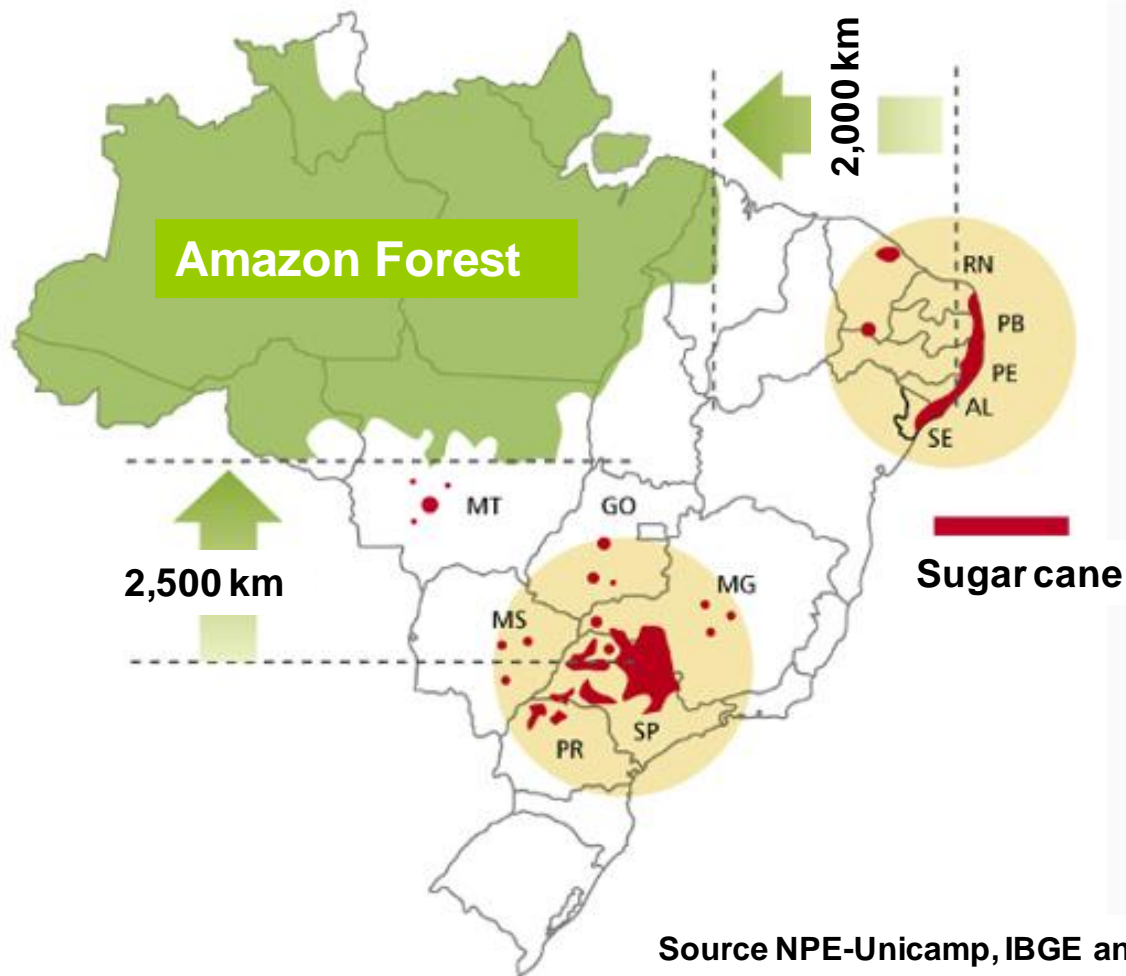
- Produced from sugar cane;
- **Anhydrous**: blended with refinery's gasoline. The current mandatory amount is 25% (v/v) in the blend (this content could be changed by government in a range of 20 – 25%),
- **Hydrated**: used in ethanol-fueled vehicles or according to consumer decision in flex fuel vehicles (FFV),
- FFV are designed to operate on any blend of gasoline and hydrated ethanol (concentration up to 100% by volume of hydrated ethanol),





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Ethanol Production Map





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Flex Fuel Vehicles

Ethanol or gasoline?



- In 2003 introduction of flex fuel vehicles – a Brazilian Product;
- Fleet is being renewed creating a significant and growing potential demand for ethanol;
- 2009: sale of flex fuel vehicles represented 92% of total car sales in the country;

10 Automotive engine manufacturers settled in the country produces nowadays more than 100 different models of Flex Fuel Vehicles,



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Flex Fuel Motorcycles

Flex-fuel motorcycles have been gaining steadily in the Brazilian market since they were first launched in 2009, and now account for 14% of overall motorcycle sales in the country. Data from the Brazilian Association of Manufacturers of Motorcycles, Mopeds and Bicycles, compiled by the Brazilian Sugarcane Industry Association (UNICA), shows that at the end of June 2010, 165,221 flex motorcycles were registered in Brazil.

Brazil was the first country in the world where flex-fuel motorcycles were offered to consumers. The first model, the CG 150 Titan Mix (1), was launched in March of 2009, followed by the NXR 150 Bros Mix (2) introduced in September of 2009, both manufactured by Honda.



(1)



(2)

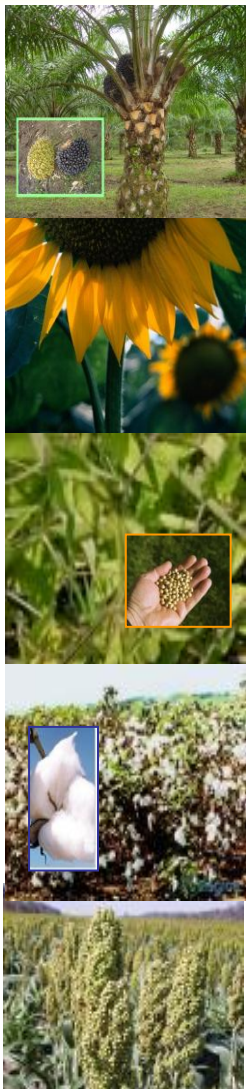
Biodiesel in Brazil



- 1960/70: Records of studies on production of biodiesel in the world (BR).
- 1970/80: Release of PRO-ALCOHOL.
- 1980: 1st Deposited Patent of Biodiesel in Brazil - Dr. Expedito Parente.
- 1988: Production of biodiesel in Austria and France.
- 1977: U.S. - Congress passes biodiesel as alternative fuel.
- 1988: Sector R & D projects in Brazil to incorporate the use of biodiesel.
- 2002: Germany Surpasses 1 million ton / year of production.

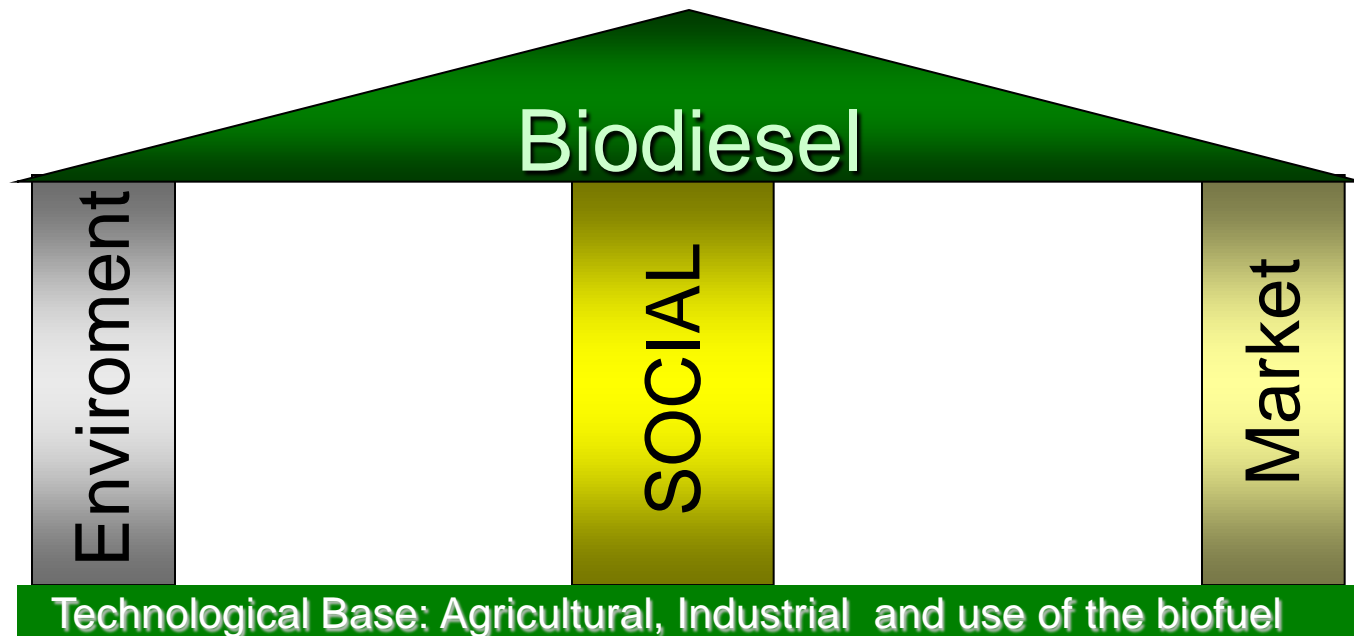
Characteristics and Objectives PNPB – I

- ☐ Inter-ministerial Program of the Federal Government;
- ☐ Aims to introduce and consolidate in a sustainable way, both technically and economically, the biodiesel in the Brazilian energy matrix;
- ☐ Focus on social inclusion and regional development by generating employment and income.



Pillars of Biodiesel in Brazil

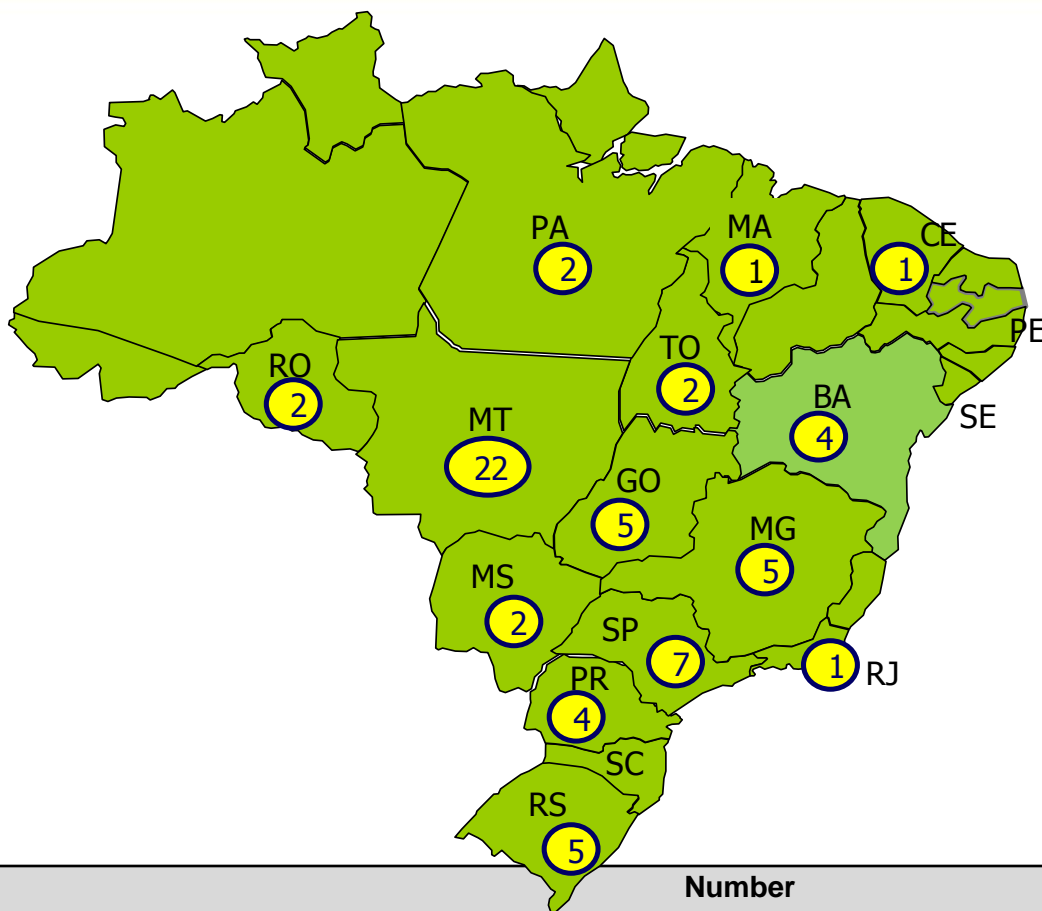
CHALLENGE: Implement a self-sustainable energy project, considering price, quality and guaranteed supply of biodiesel, providing income generation and social inclusion.





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Biodiesel Plants



	Number	Capacity (m³/day)
Plants authorized for operation	10	325.10
Plants authorized for operation and commercialization	53	13,796.53
Total	63	14,606.64

Biodiesel Program

Main goals

- 
- To introduce a new fuel in a sustainable way
 - To increase diversification of the Brazilian Energy Balance
 - To reduced dependency on petroleum imports.
 - To create jobs and revenue, particularly in rural areas, for family farmers
 - To decrease regional disparities and develop the North and Northeast regions
 - To decrease pollution emissions
 - To allow technological and regulatory flexibility
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Evolution in the World

The world is committed to find lasting solutions to its energy problem. The environmental concern has been the focus of discussions and initiatives worldwide, especially with regard to emissions of greenhouse gases. The energy sector in Brazil has promoted several changes in order to revive and create projects that take into account the preservation of environment and labor market. Biofuels come in as a priority energy strategy for sustainable development. New engine technology has caused important changes in the automobile industry and in the attitude of other actors in the market.





International Harmonization of Biofuels

Brazil / US / EU: Development of the "White Paper" for biofuels (ethanol and biodiesel) to identify properties and possible limits to be harmonized in the short, medium and long term (January 2008).

MERCOSUR: Report on the activities of the working group for technical harmonization of biofuels - last meeting in September 2010.

Next Steps: Discussion of proposals and cooperation to promote alignment and mitigation of differences among methods and specifications.

- **EU Directive;**
- **CARB;**
- **EPA;**
- **RTFO;**
- **RSB;**
- **GBEP;**
- **Cramer Report**

World Initiatives

- Emphasis is in the reduction of the GGE emission;
- LUC and ILUC
- Preservation of biomass and biodiversity reserves.
- Impacts in water and soil.
- Socio-economic impacts

Brazil's Initiatives

- ✓ National Agro- ecological Zoning
- ✓ Agro-environmental Zoning in São Paulo
- ✓ Inmetro – Brazilian Program of Biofuels Certification
- ✓ Environmental Protocols in SP and MG
- ✓ National Commitment to Improve the Work Conditions on Sugar Cane
- ✓ Producers and Importers Initiatives (SEKAB)
- ✓ GBEP: Active Participation from Government (MRE)
- ✓ ISO : Participation in the proposition and development of the standard ISO/PAC 248 – Sustainability Criteria for Bioenergy.
- ✓ Joint effort from Government, producers and Research Centers to achieve the sustainability of biofuels production.



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Agro-ecological Zoning of Sugarcane (ZAE)

ZAE is one of the most detailed studies worldwide and the most structured in the country under social, environmental and economical perspectives, and enforces the importance of planning and strategic conduction in its development so as to make Brazil a leading energy producing nation, which respects biodiversity. The proposal includes a series of environmental measures, such as:

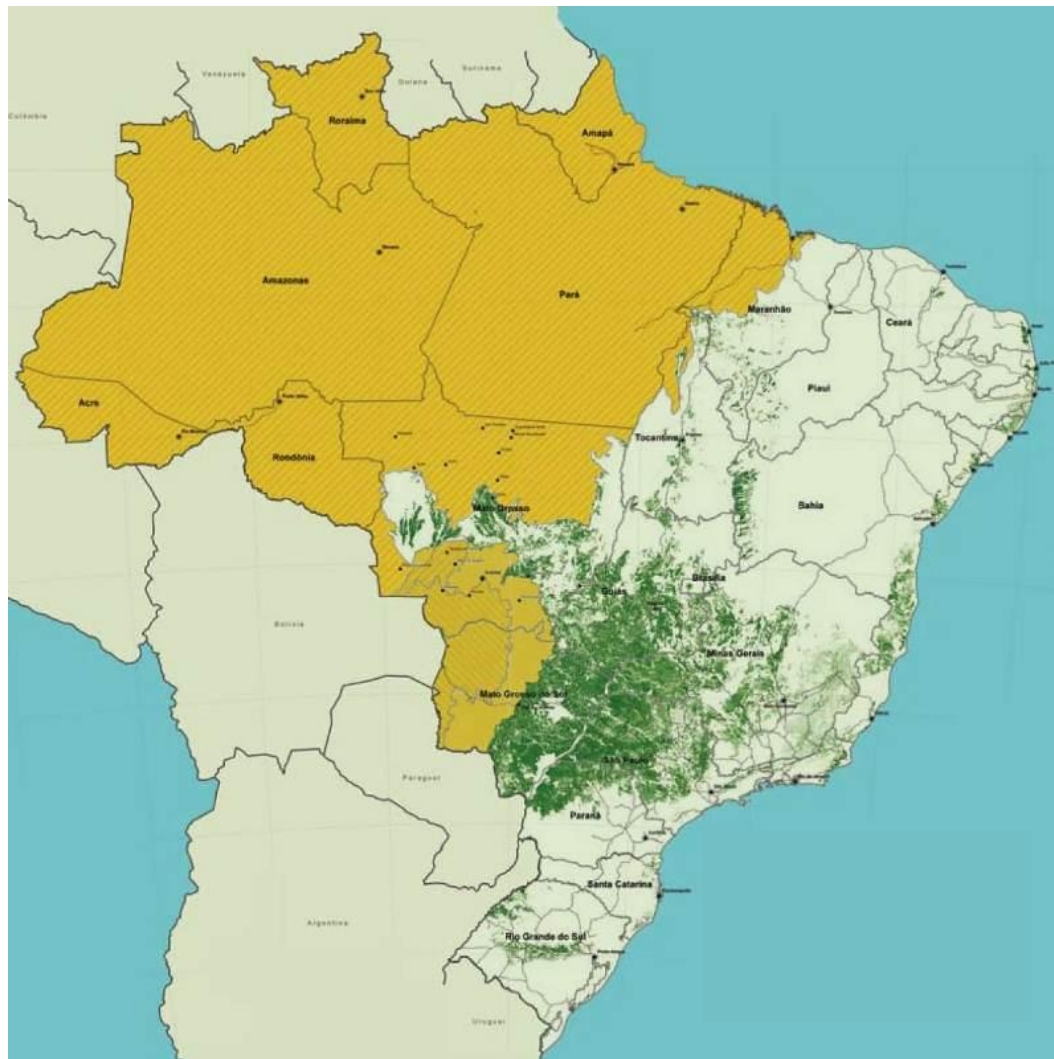
- Elimination of sugarcane wildfires by using mechanized harvesting.**
- Prohibition of depleting the native vegetation.**
- Proper disposal of vinasse (which as a by-product from the distillation of the alcohol fermenting liqueur from sugarcane). Today, vinasse is discarded into rivers.**
- Change vinasse into biogas and bio-fertilizers.**
- Beneficiation of sugarcane straw to produce renewable energy.**
- Prohibition of invading food-production areas.**





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Agro-ecological Zoning of Sugarcane (ZAE)



suitable areas



The Upper Paraguay River Basin ,
Amazon and Pantanal biomes

Biofuels Sustainability

The U.S. Environmental Protection Agency (EPA) has confirmed that ethanol made from sugarcane is a low carbon renewable fuel, which can contribute significantly to the reduction of greenhouse gas (GHG) emissions. As part of announcement finalizing regulations for the implementation of the Renewable Fuel Standard (RFS2), the EPA designated sugarcane ethanol as an advanced biofuel that lowers GHG emissions by more than 50%.

EPA affirmed that sugarcane ethanol meets the “other advanced” category in the RFS2, although with a GHG reduction level that exceeds the requirement for all categories as well. Specifically, EPA’s calculations show that sugarcane ethanol from Brazil reduces GHG emissions compared to gasoline by 61%, using a 30-year payback for indirect land use change (iLUC) emissions.



ANP ACTIONS



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Interlaboratory Program for Biodiesel

The ANP Technological Analysis and Research Centre has implemented the interlaboratory Program for Biodiesel which main goals are:

- ✓ evaluate the individual ability of each laboratory in realize the proposed analysis;
- ✓ monitor constantly the efficiency of the laboratories;
- ✓ identify analytic problems and apply corrective actions;
- ✓ provide additional trust to the laboratories clients.

➤ 6th edition
➤ 53 laboratories

1st Edition	26 laboratories
2 nd Edition	30 laboratories
3 rd Edition	34 laboratories
4 th Edition	42 laboratories
5 th Edition	45 laboratories
6 th Edition (in course)	53 laboratories



TERM OF COOPERATION ANP – INMETRO

Partnership between ANP and INMETRO to realize Proficiency Tests using samples with reference values certificated by INMETRO.

ANP will provide the laboratories participants of the interlaboratory program with samples certificated by INMETRO in many characteristics applied to biofuels (ethanol and biodiesel), contributing to the increase of the confiability and rastreability of the measurements.

General Objective

- Prepare the laboratories that form the characterization networks of quality control of biofuels to realize the analysis of biofuels according to the international requirements and solicit the accreditation of INMETRO

Specific Objectives

- Realize analysis according to international requirements;
- Implement the requirements of the standard ABNT NBR ISO / IEC 170125;
- Harmonize the analysis/ characterization methodologies and the rastreability of the measurements;
- Contribute to the organization of interlaboratory programs and proficiency testing.



Consolidation of the Network of Studies and Projects About Storage of Biodiesel and its Mixtures

This Project proposes the generation of knowledge and technology to the development of studies and projects to elucidate and mitigate problems related to time action over biodiesel and its mixtures, commercialized and used in the market. The main objects of study are:

- ✓ loss of properties of cold flow;
- ✓ corrosion;
- ✓ monitoring of biodiesel quality in real conditions of distribution and storage;
- ✓ proposition of methodologies to mitigate the problems

13 Institutions participants

Proposals for a Comparison List of Test Methods

Discussion about the details concerning identities/equivalences/differences of test methods listed in the tri-partite white paper during the last ISO/TC28/SC7 meeting in Rio, where it was concluded that a more structured approach would be useful.

ETHANOL

NBR 9866	Ethanol –Verification of alkalinity and determination of total acidity
NBR 10547	Ethanol – Determination of Electrical Conductivity
NBR 8644	Determination of evaporation residue



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ISO/TC 28/SC 7 N0008

Biodiesel

NBR 15553	Fat and oil product derivatives - Fatty acid methyl/ethyl esters - Determination of calcium, magnesium, sodium, phosphorus and potassium content by inductively coupled plasma optical emission spectrometry (ICPOES)
NBR 15556	Fat and oil product derivatives - Fatty acid methyl/ethyl esters - Determination of sodium, potassium, magnesium and calcium content by atomic absorption spectrometry.
Project 62:000.00-001	Biodiesel - Determination of total esters content by gas chromatography
NBR 15343	Biodiesel - Determination of methanol or/and ethanol concentrations in fatty acid esters by gas chromatography
NBR 15342	Biodiesel - Determination of monoglycerides, diglycerides and total esters content of castor oil biodiesel by gas chromatography.
NBR 15341	Biodiesel - Determination of free glycerol in castor oil biodiesels by gas chromatography.
NBR 15344	Biodiesel - Determination of total glycerin and triglycerides contents in castor oil biodiesels.



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GANHA O BRASIL.**

PRÊMIO CONSUMIDOR MODERNO.

O Centro de Relações com o Consumidor da ANP ganhou o XI Prêmio Consumidor Moderno de Excelência em Serviços ao Cliente, na categoria Serviços Públicos Federais. Para a ANP, este prêmio é uma honra porque reconhece o resultado do trabalho da Agência para estar mais perto dos consumidores e dos revendedores de combustíveis e de toda a sociedade. Os contatos com o CRC contribuem para aprimorar as práticas do mercado e também orientam as ações da fiscalização da ANP. Portanto, todos os brasileiros ganham quando você fala conosco em www.anp.gov.br e pela **0800-970-0267**.

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