Outlook for biofuels regulation in Brazil

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Brazilian Energy System

Policy Making

PRESIDENCY OF THE REPUBLIC

National Energy Policy Council – CNPE

Ministry for Mines and Energy - MME

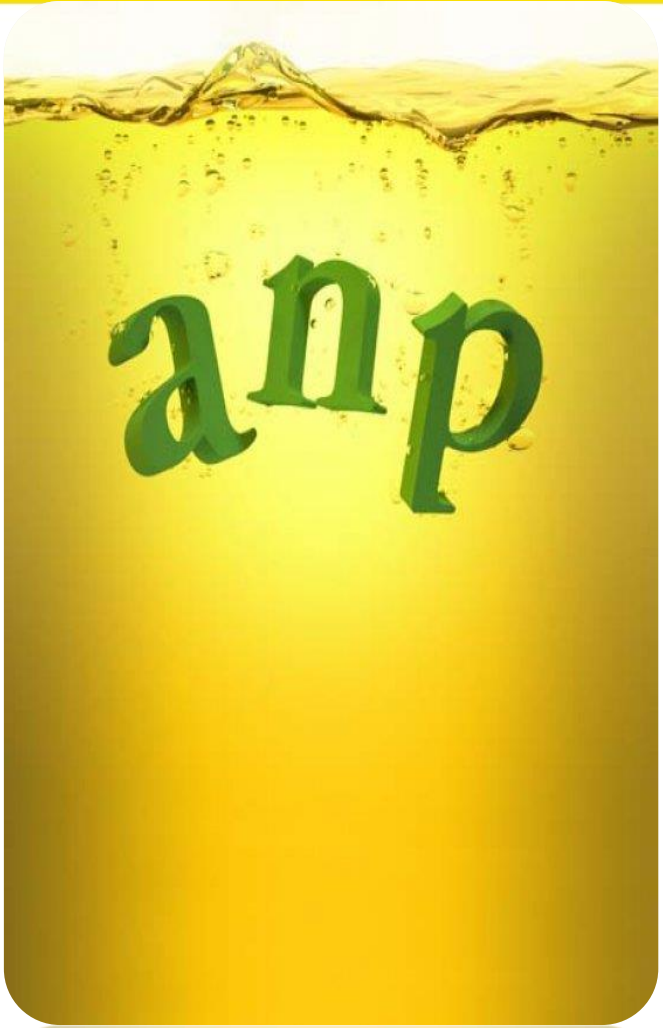
Regulation and Policy Implementation

ANEEL
AGÊNCIA NACIONAL DE ENERGIA ELÉTRICA

anp
Agência Nacional do Petróleo, Gás Natural e Biocombustíveis

Oil, Natural Gas and Biofuels regulated under the same institutional environment: ANP

ANP Attributions



Laws 9.478/1997;11.097/2005; 12.490/2011

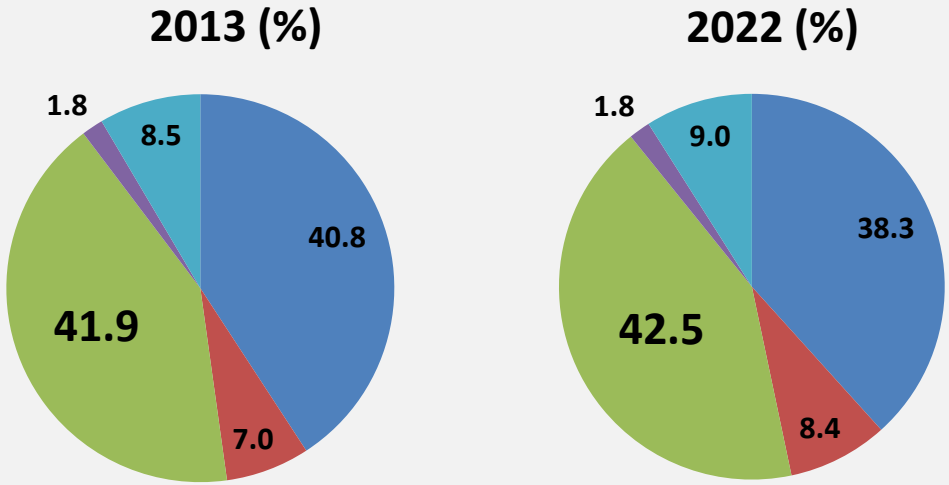
•Implement the national oil, natural gas and **biofuels** policies as part of the national energy policy, with emphasis on the consumers' interest regarding to **price, quality** and **availability** of products.

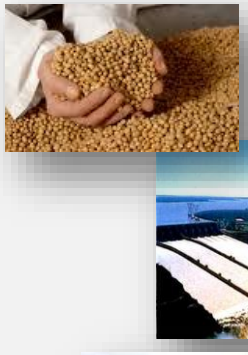
•Specify the quality of petroleum, natural gas, its derivatives, and **biofuels**.

•Expand the jurisdiction of the ANP to all the **biofuels** industry.

Brazilian Energy Matrix

- Share of renewable energy of the energy matrix remains strong.

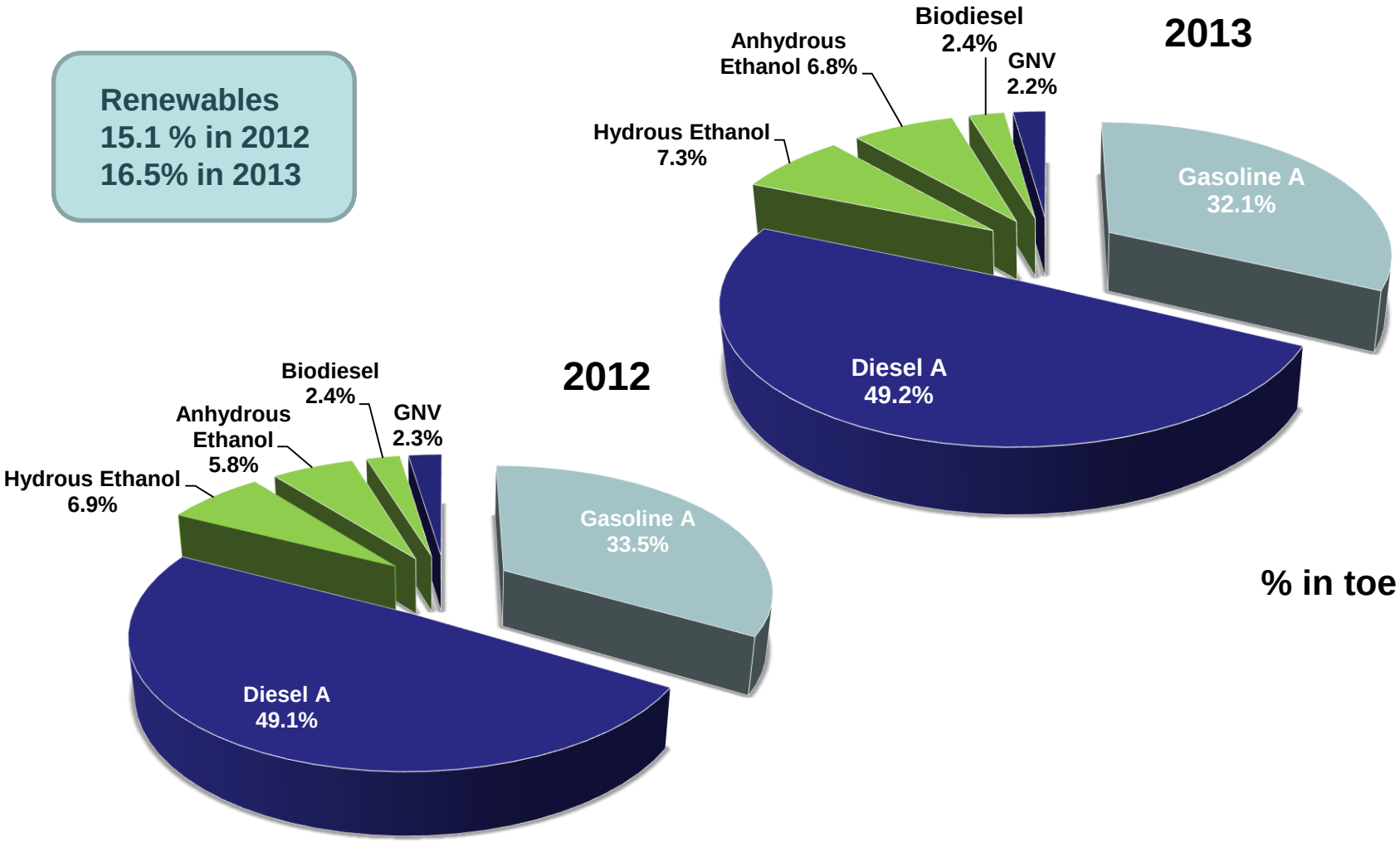




Source: PDE 2022/EPE – (Adapted)

Renewables in Transportation

Renewables
15.1 % in 2012
16.5% in 2013

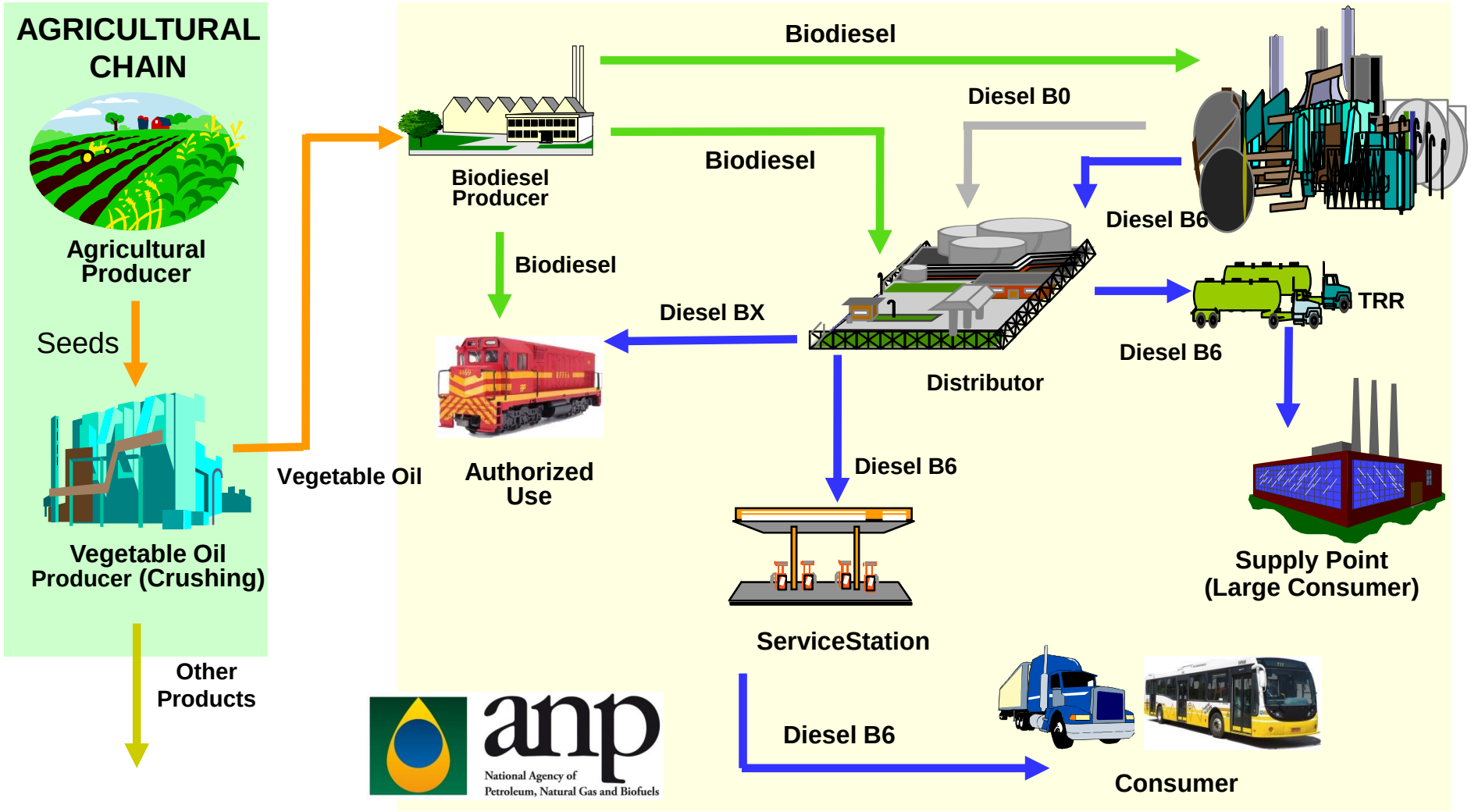


Source: ANP

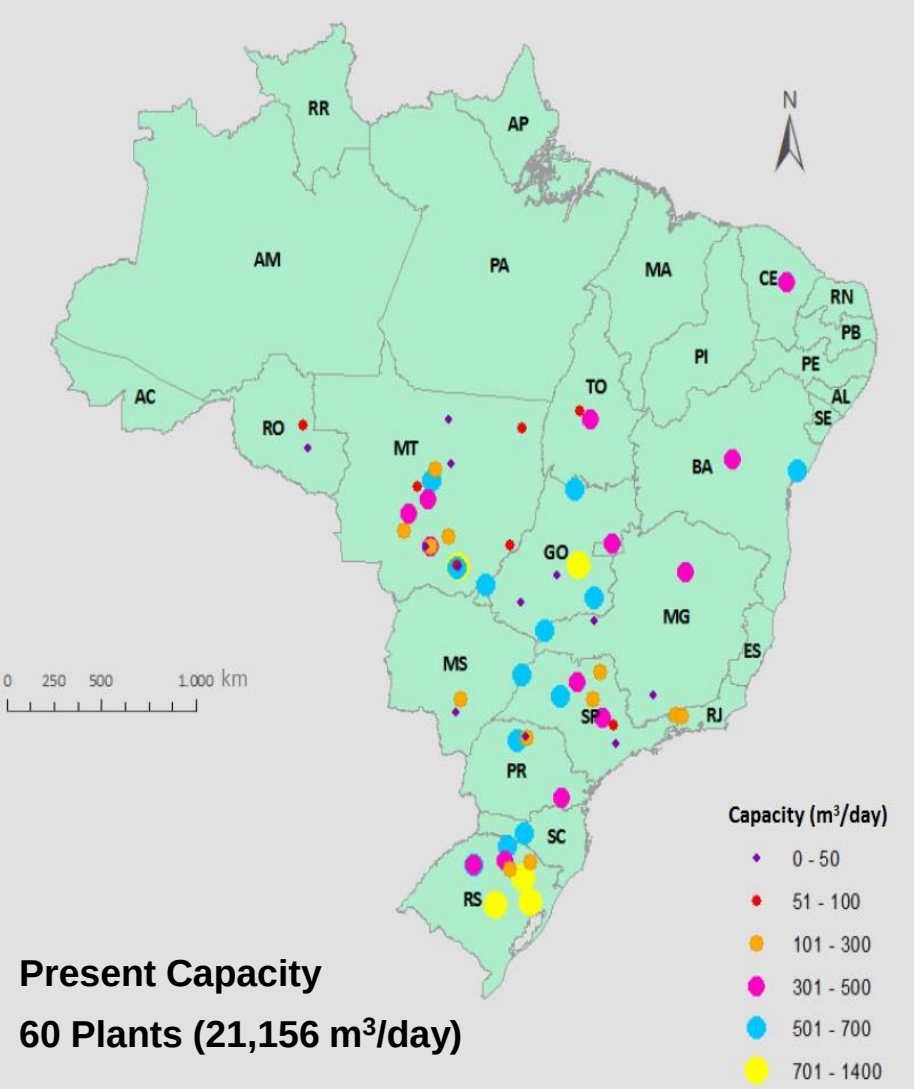
National Agency of Petroleum, Natural Gas and Biofuels

Biodiesel

Biodiesel Supply Chain

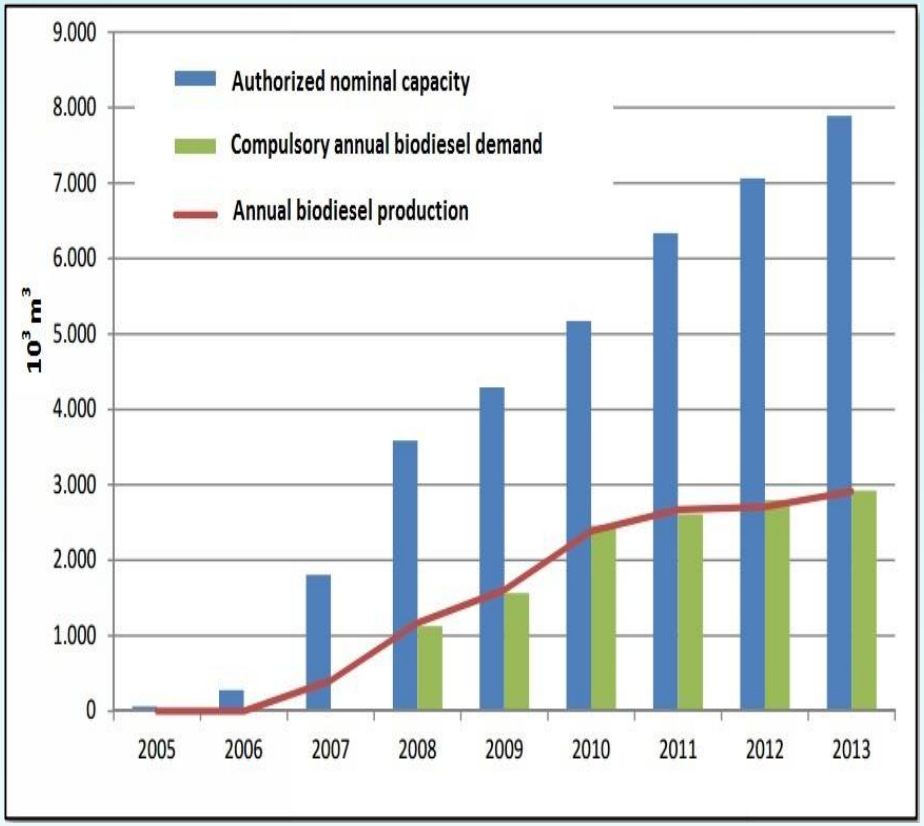


Biodiesel Production Capacity



Present Capacity

60 Plants (21,156 m³/day)



Biodiesel Auctions

Since 2005, ANP is responsible for biodiesel auctions.

The <u>initial goal was to develop the biodiesel market and stimulate the production</u> in order to guarantee amounts for the refineries and distributors to carry on the mixture determined by law.

Now the focus is to ensure that all diesel commercialized in Brazil contains the proper percentage of biodiesel required by law.

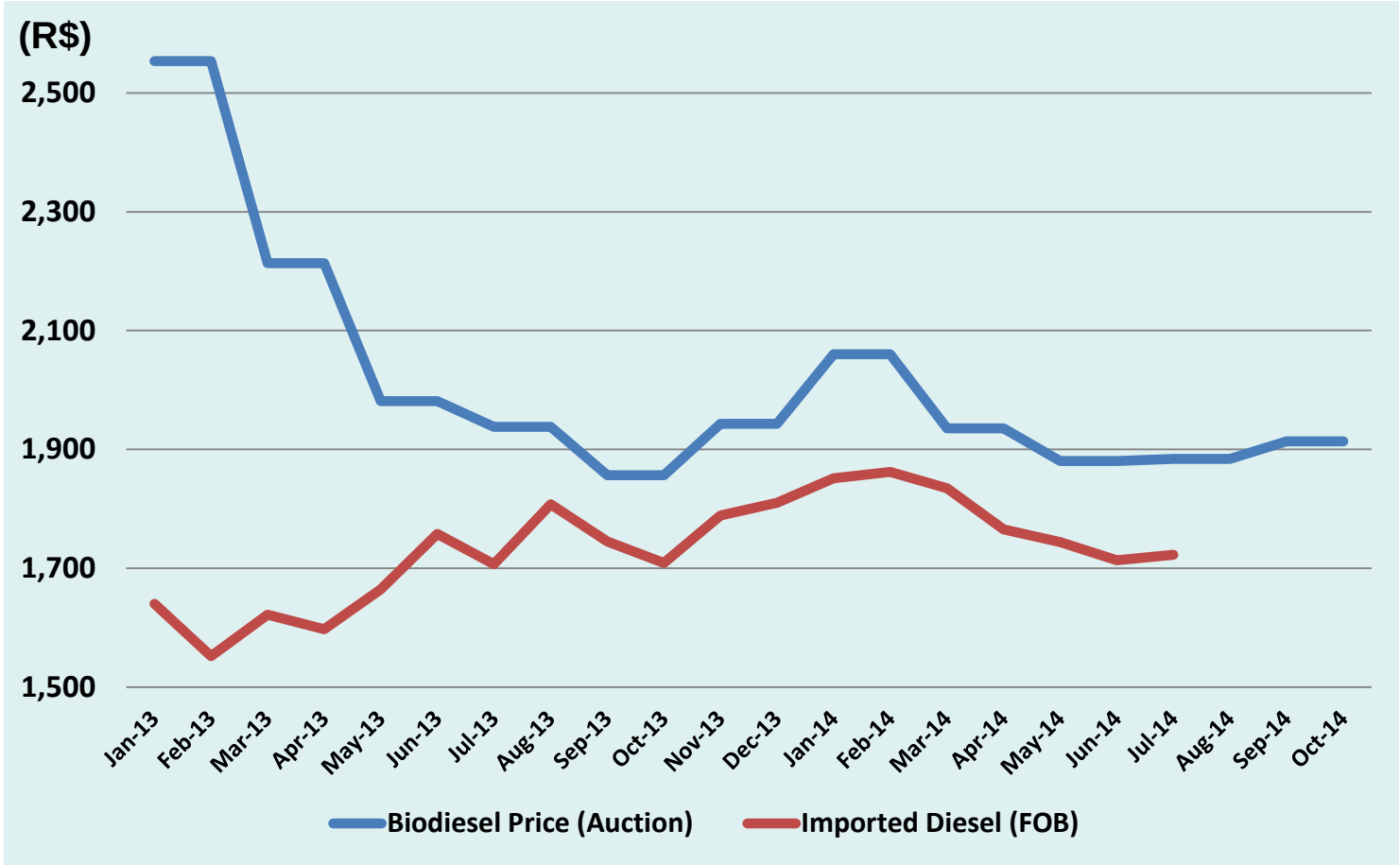
The production and usage of biodiesel in Brazil both encouraged the development of a sustainable energy source and <u>resulted in decreasing amounts of diesel oil imports</u>.

Biodiesel Content

The Provisional Measure 647 had changed the compulsory percentage of biodiesel blended with diesel oil.

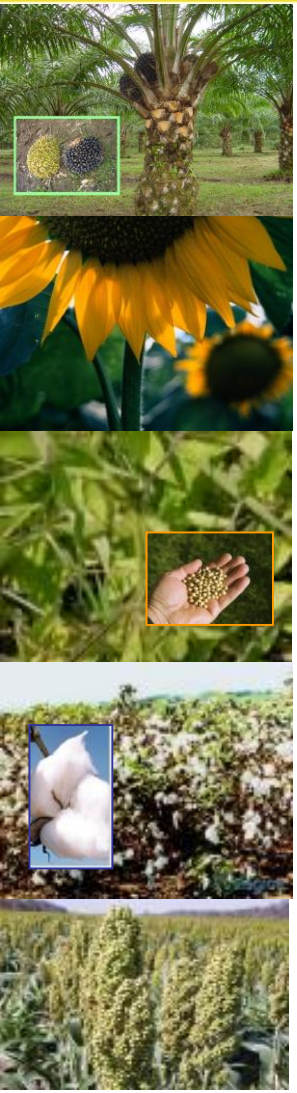
until June 2014	Jul, 2014	Nov, 2014
5%	6%	7%

Biodiesel Auction Prices



Source: SECEX / BACEN / ANP

Biodiesel Specification
ANP Act 45/2014



Property	Unity		Limit
Density at 20ºC	kg/m³		850 to 900
Kinematic Viscosity, 40°C	mm²/s		3.0 to 6.0
Flash Point (closed cup)	°C	min.	100
Sulfated ash	%m/m	max.	0.020
Copper strip corrosion		max.	1
CFPP	°C	max.	Region specific
Acid number	mg KOH/g	max.	0.50
Free glycerin	%m/m	max.	0.020
Total glycerin	%m/m	max.	0.25
Methanol or Ethanol	%m/m	max.	0.20
Oxidation Stability	h	min.	6 8 (B7)
Sulfur	%m/m	max.	0.005
Na+K	mg/kg	max.	5
Ca+Mg	mg/kg	max.	5
Phosphorus	%m/m	max.	0.001
Cetane Number		min.	Report
Iodine Number			Report
Monoglycerol	%m/m	max.	0.7
Esther content	%m/m	min.	96.5
Total contamination	mg/kg	max.	24
Total Water	mg/kg	max.	200 350 (for distributers)

Biodiesel Quality

Biodiesel Labs Registration

- ANP Act 6 /2014: the requirements for registration of laboratories interested in the testing of biodiesel;
- Technical audit of the laboratory procedures and materials that potentially impact the quality and liability of the analysis;
- Traceability between the Quality Certificates and the product;
- 45 laboratories registered at ANP;
- In 2015, the laboratories and institutions registered at ANP shall be certified by INMETRO according to the standard NBR ISO IEC 17025.

Interlaboratory Program for Biodiesel

- 60 participating labs;
- Evaluate the individual ability of each laboratory in proceed the proposed analysis;
- Monitor labs efficiency constantly;
- Identify analytical problems and suggest corrective actions.

International Cooperation

- 1st Proficiency testing in biofuels;
- Partnership with INMETRO to ensure greater reliability of the measurements;
- 44 laboratories participated in testing Biodiesel parameters.

National Agency of Petroleum, Natural Gas and Biofuels

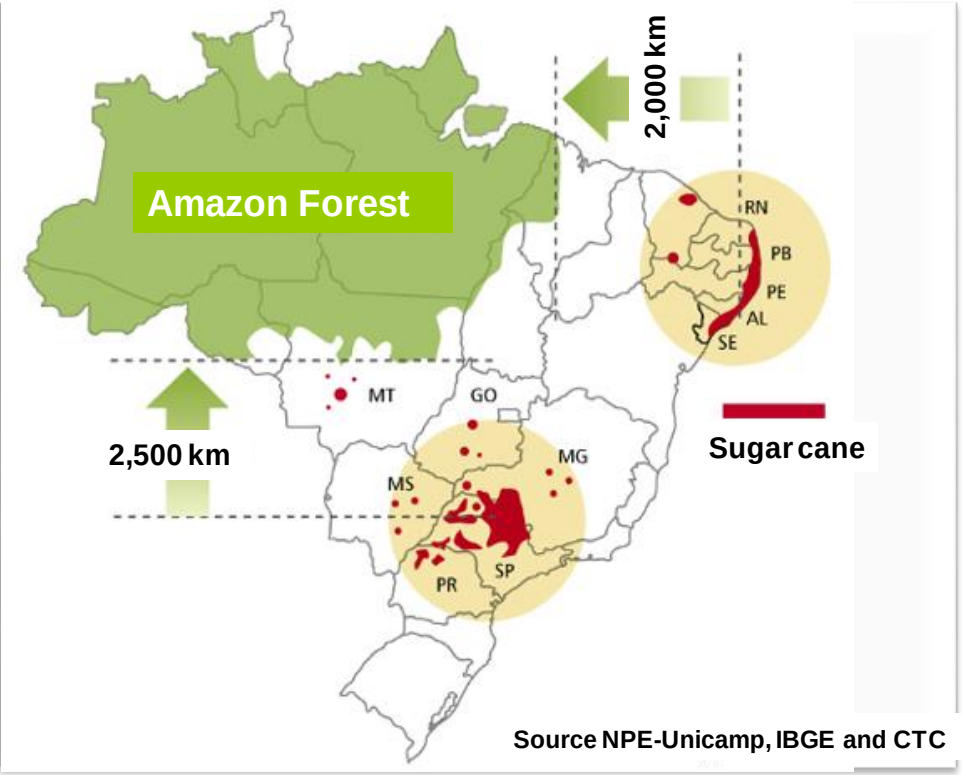
Ethanol

Ethanol

- Produced from sugar cane;
- Anhydrous: blended with refinery's gasoline. The current mandatory amount is 25% (v/v) in the blend;
- Hydrous: used in ethanol-fueled vehicles or according to consumer decision in flex fuel vehicles (FFV);

The brazilian main option as fuel additive or as a substitute for gasoline to diversify and decarbonize the fuel matrix.

Ethanol Production Map



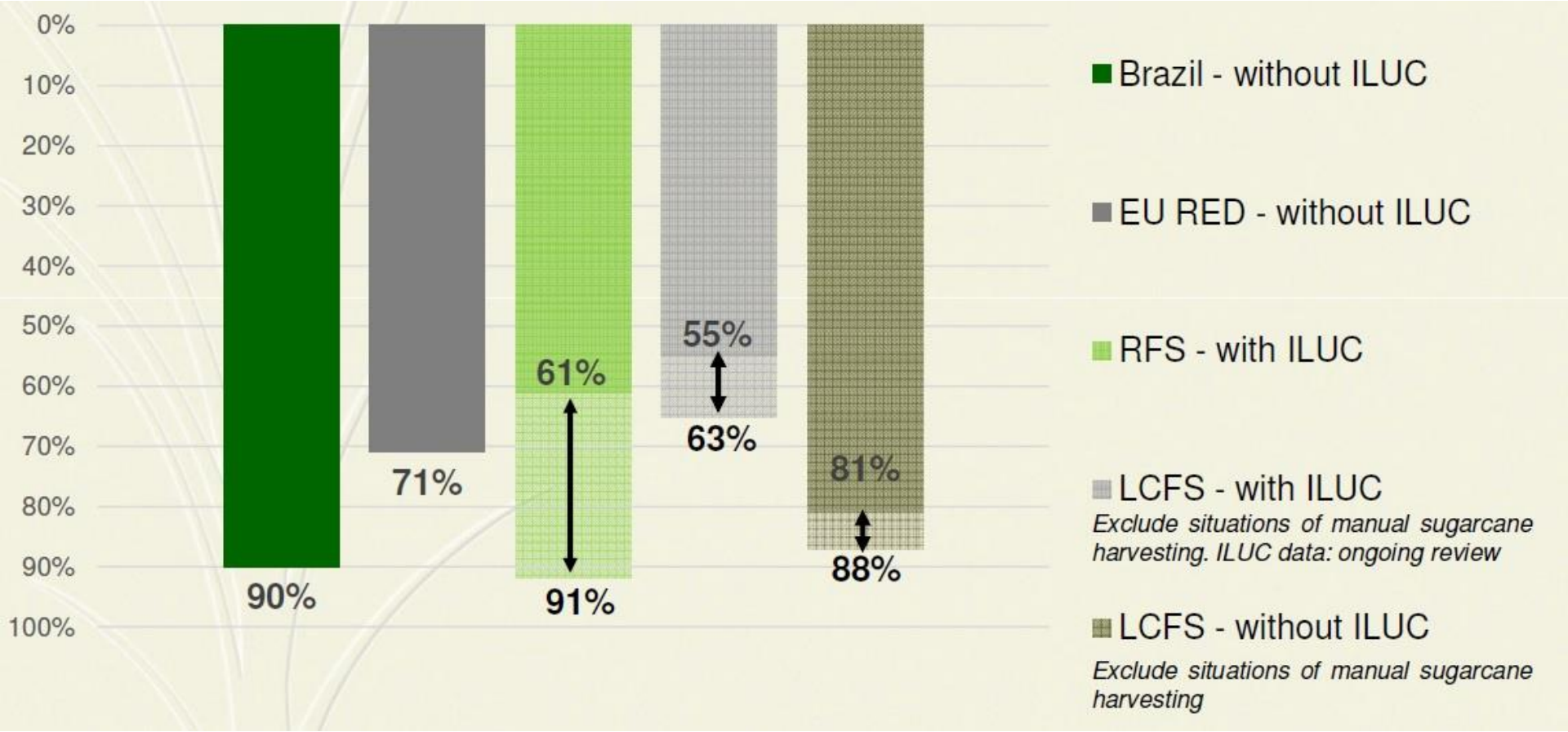
The Sugarcane Agro-Ecological Zoning, elaborated by the Ministry for Agriculture,authorized sugarcane cultivation on 64.7 million hectares (7.5% of the national territory).

Sugarcane for ethanol: 4.9 Mha

407 authorized by ANP

GHG Emissions reduction

GHG emissions avoided with ethanol replacing gasoline (based on a life-cycle basis)



Source: Isaias Macedo e Joaquim Seabra (2008); RFS; CARB and European Directive / UNICA

Ethanol

Brazilian Market

✓Total production around 30,0 bi liters in 2012/2013;

✓Increased demand with the flex-fuel technology (94% of Brazilian vehicle sales and 22% of motorcycle fleet);

✓Fuel present in every light vehicle;

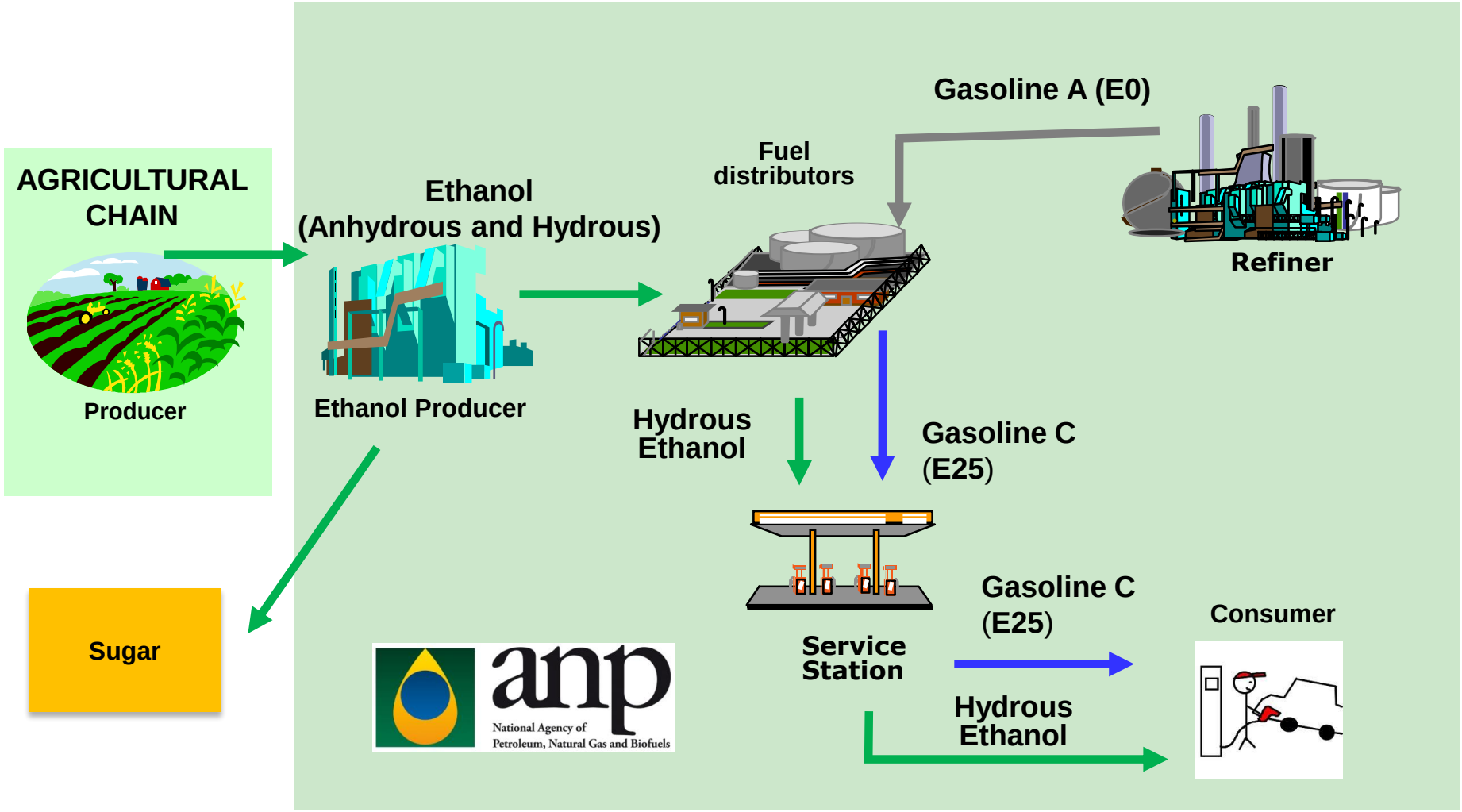
✓More than 30 years of commercial use;

✓Consolidated production and supply;

✓ Ethanol 2nd Generation: potential to expand the supply;

✓Other uses: heavy vehicles and airplanes.

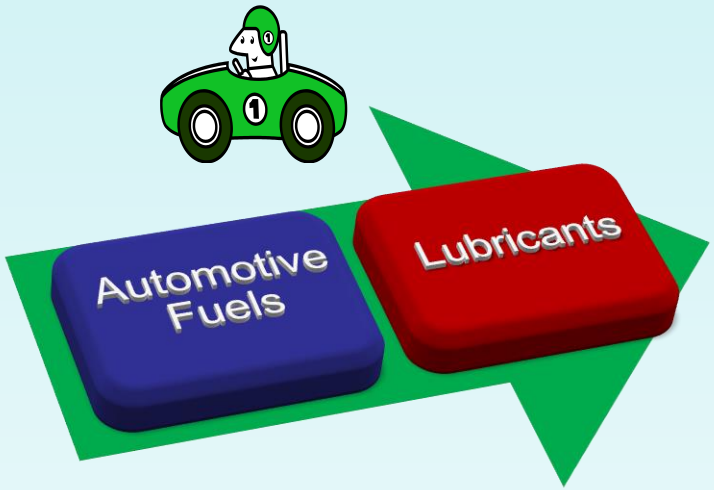
Ethanol Supply Chain



ANP Act 7/2011
Ethanol Specification

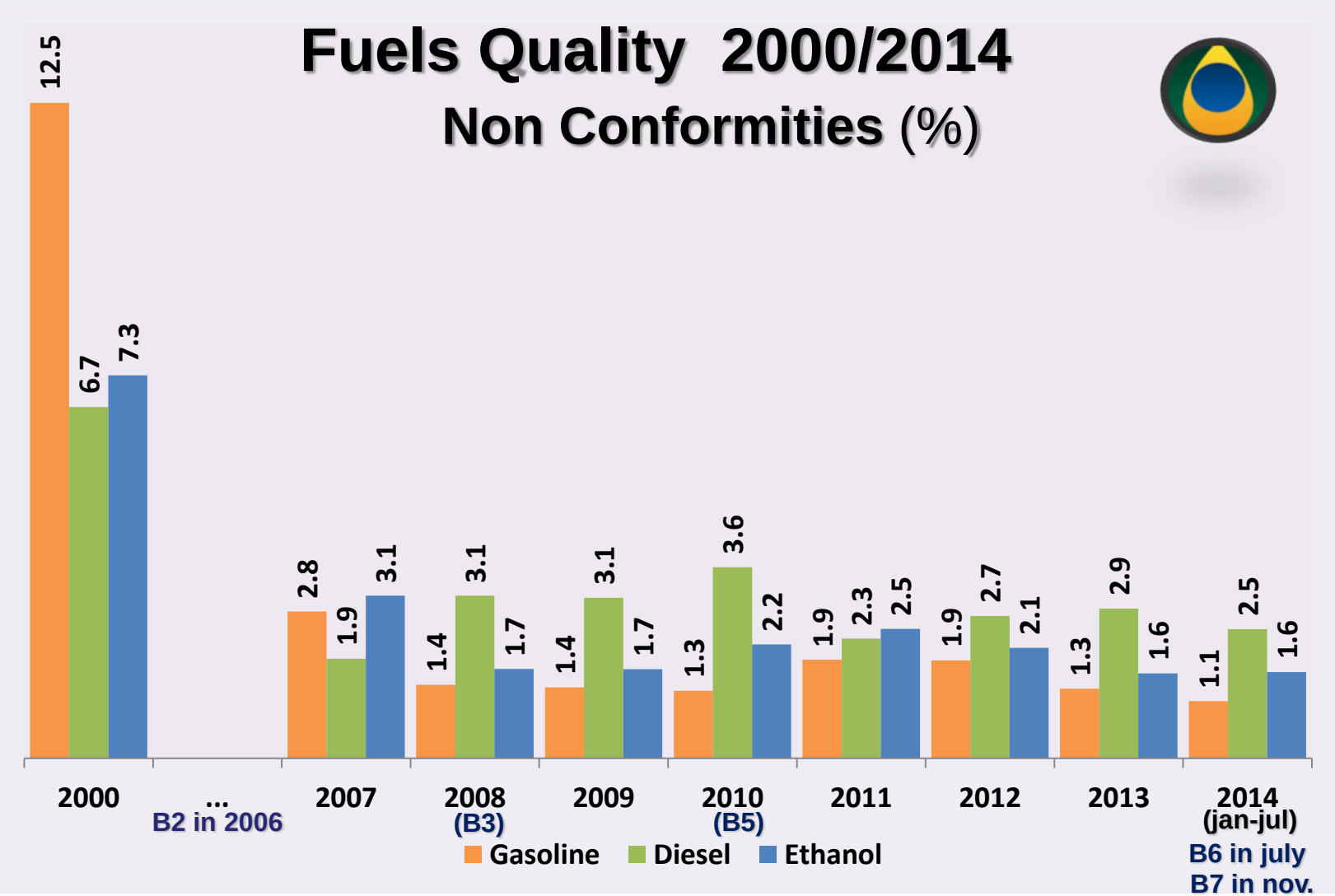
Property	Unity		Anhydrous	Hydrous	Premium
Density at 20ºC	kg/m³	max.	791.5	807.6 to 811.0	799.8 to 805.
Alcoholic Content at 20°C	%v/v	min.	99.6	95.1 to 96.0	96.0 to 97.5
	%m/m	min.	99.3	92.6 to 93.8	94.7 to 96.0
Ethanol Content, min. (imp)			98.0	94.5	
Water	%v/v	max	0.4	4.9	
Acidity	mg/L	max.	30		
Electrical Conductivity	µS/m	max.	350		
pH	-	-	-	6.0 to 8.0	
Copper	mg/kg	max.	0.07	-	
Chloride	mg/kg	max.	1		
Washed gum	mg/100 mL	max.	5		
Appearance	-		Clear & No Impurities		
Color	-		Orange (dye)	no dye	
Methanol	%v/v	max.	1		
Hydrocarcarbon	%v/v		3		
Residue by evap.	mg/100 mL	max.	5		
Sodium	mg/kg	max.	2		
Sulfate	mg/kg	max.	4		
Iron	mg/kg	max.	5		

Program for Monitoring Fuels Quality and Lubricants



20 universities and research centers
Around 220,000 samples/year - all fuels
Over 80,000 samples/year - B5
Over 34,000 inspected service stations

Programs for Monitoring Quality of Fuels and Lubricants



Source: ANP

National Agency of Petroleum, Natural Gas and Biofuels

New biofuels

New Biofuels and Regulation

Scope: Regulation to authorize biofuels tests by ANP for evaluation of non specified blends or new fuels to be used by captive fleet or in industrial process.

B6 to B20: Resolution ANP 2/2011;

New fuels: Resolution ANP 23/2012.

Outcome: Report of test results based on consumption, emissions and performance aspects.

Perspective: To build a solid overview of the new fuel and its compatibility with the current scenario of fuel, indicating the pros and cons to the government in order to subsidize biofuels policy.

New Biofuels: Biojet fuels

ANP ACT n° 20/2013

Establishes the specification for aviation alternative fuels containing synthesized hydrocarbons (based on **ASTM process**) and obligations with regard to control of quality.

Aviation alternative fuels specified:

- FT SPK: from **coal and natural gas** but the use of **biomass** as a feedstock is allowed (thus providing a renewable path);
- HEFA SPK: from **fats and oils;**
- SIP**: synthetic iso-parafins.**

Conclusions

Support regulatory impact analysis for biofuels.

Domestic biofuels for ground transportation are consolidated, but for export depend on sustainability criteria nonconsensual.

For aviation biofuel, ANP established a spec in accordance to international ones and works to eliminate technical regulation barriers.

Bolster the introduction of new fuels on the market with better results for fit for purpose and emissions tests compared to fossil fuels.

Uphold the improvement of fuel economy that can be dramaticaly improved in the light- and heavy-duty sectors through the advancement and application of new technology.

National Agency of Petroleum, Natural Gas and Biofuels

FINAL REMARK

ANP strongly supports the international effort cooperation towards biofuels as well as the implementation of the biofuel policy by improving or conducting new regulations to consolidate the share of biofuels in our energy mix.

National Agency of Petroleum, Natural Gas and Biofuels

Thank you for your attention!

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