



Ministério de
Minas e Energia



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Director of Renewable Fuels Department

Praia, December 6th, 2011

Sessão 2. Energias Renováveis na África Ocidental Desafios e Perspectivas

“Experiência brasileira e sua visão sobre a cooperação com a
África Ocidental”: Diversificação das fontes de energia

PRAIA, CABO VERDE
5-6 DEZEMBRO 2011



CLUB FORUM

ÁFRICA OCIDENTAL E BRASIL FRENTE AOS DESAFIOS DAS ENERGIAS RENOVÁVEIS
WEST AFRICA AND BRAZIL: ADDRESSING RENEWABLE ENERGY CHALLENGES
L'AFRIQUE DE L'OUEST ET LE BRÉSIL FACE AUX ENJEUX DES ÉNERGIES RENOUVELABLES

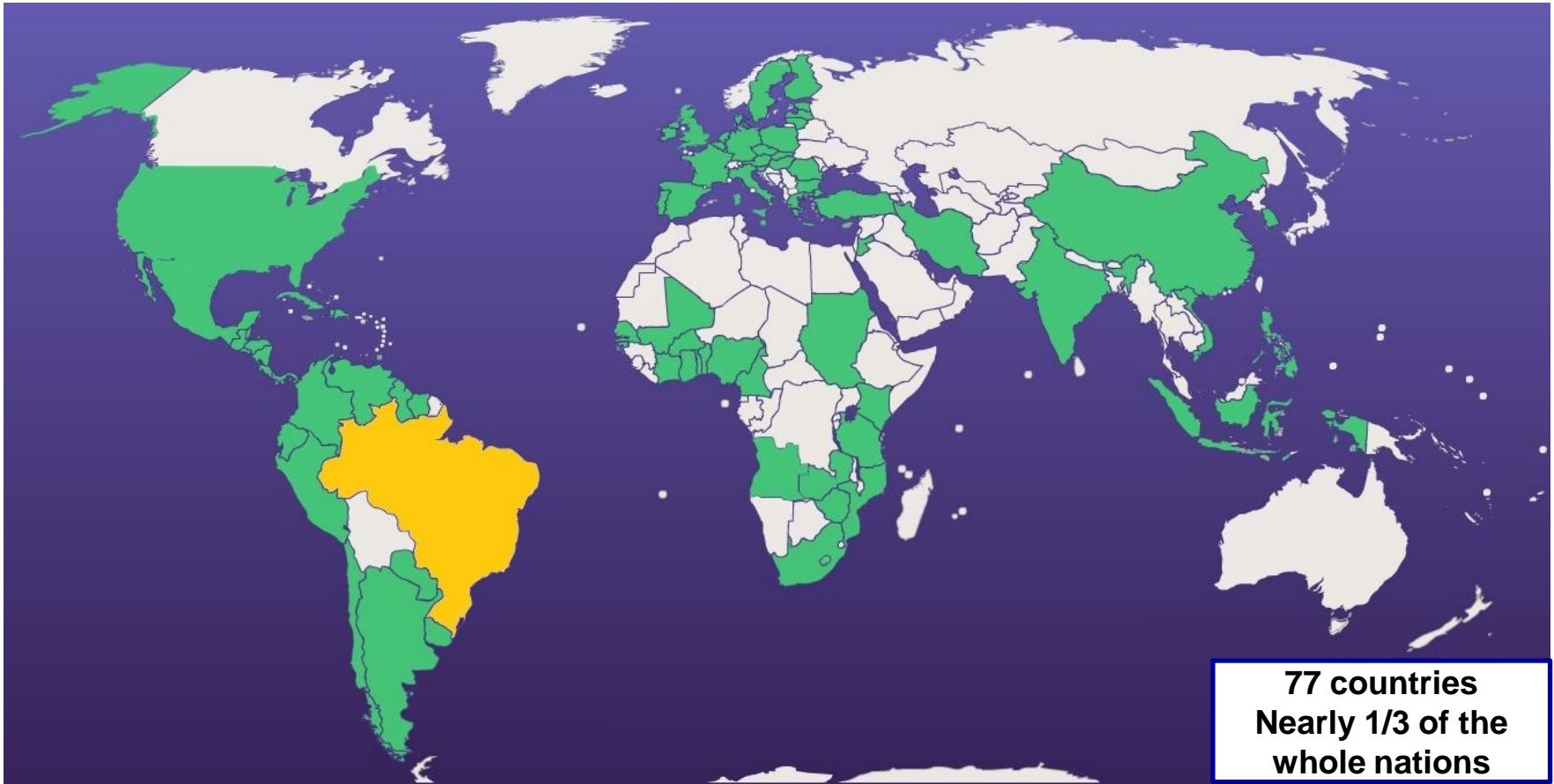
Apoiado pelo Governo do Cabo Verde - hosted by the Government of Cape Verde - accueilli par le Gouvernement du Cap-Vert





International Cooperation

Map of International Agreements on Bioenergy sign by Brazilian Representatives



* Includes MoUs, partnerships and other agreements signed directly by any Federal Government Department or Agency or Public Enterprise. **It was considered bilateral agreements, cooperation in third countries and agreements signed with economic or regional blocks.**



Brazil and Africa

African Continent has huge potential to produce biomass

Brazilian Government is willing to cooperate with African countries, but unfortunately there are limited resources.

African countries need to focus its policies aligning it with each country vocation;

Governments must decide to go for it;

Feasibility studies are key in this process!





Biofuels in Africa

EU Target for Transports

Can Africa deliver it ? SURE!

- 10 % bioethanol in 2020 = 25 million cubic meters
- 25 million cubic meters ethanol need 4 million hectares of land (with a productivity of 6,250 liters per hectare)

According to FAO (2008)

- Potential arable land (excluding forest, cities etc) = 750 million hectares
- Land suitable to grow sugarcane without irrigation = 166 million hectares

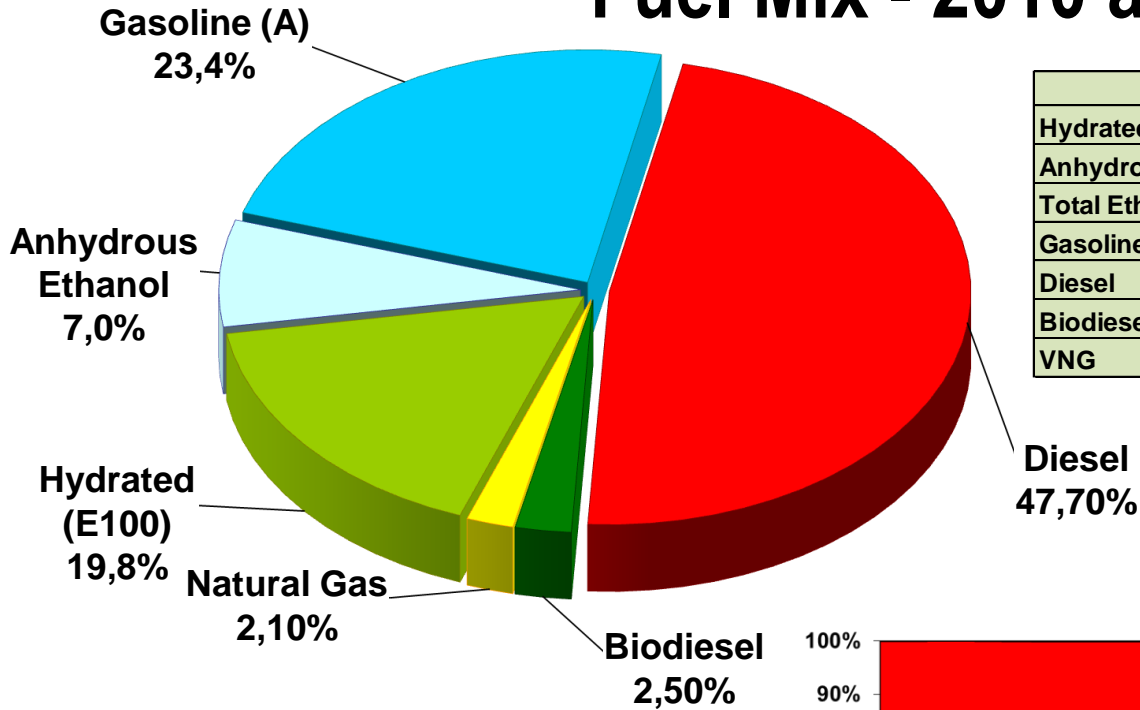
So...

There is enough land for native vegetation, for agriculture, for food production and for biofuels!

Land needed to supply EU target 2020	km ²	%
Africa	30.663.397	0,1%
Democratic Republic of Congo	2.344.858	1,7%
Angola	1.246.700	3,2%
Tanzania	945.087	4,2%
Benin	112.620	35,5%
Burkina Faso	274.200	14,6%
Cabo Verde	4.033	991,8%
Ivory Coast	322.460	12,4%
Gambia	10.380	385,4%
Gana	238.534	16,8%
Guiné	245.857	16,3%
Guiné Bissau	36.120	110,7%
Liberia	111.370	35,9%
Mali	1.240.000	3,2%
Níger	1.267.000	3,2%
Nigéria	923.768	4,3%
Senegal	196.190	20,4%
Serra Leoa	71.740	55,8%
Togo	56.785	70,4%



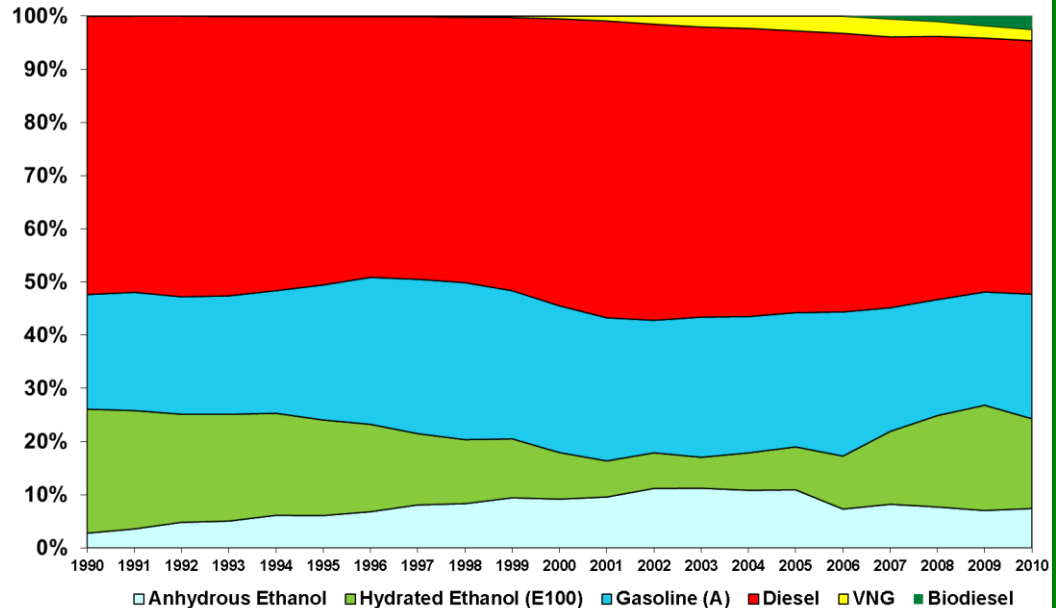
Fuel Mix - 2010 and Recent Evolution



	2009	2010	Var (2010/2009)
Hydrated (E100)	19,80%	16,89%	-14,70%
Anhydrous Ethanol	7,03%	7,42%	5,45%
Total Ethanol	26,83%	24,30%	-9,41%
Gasoline	21,31%	23,42%	9,90%
Diesel	47,73%	47,68%	-0,11%
Biodiesel	1,80%	2,50%	39,26%
VNG	2,34%	2,10%	-10,16%

✓ **Highlights:**

1. Biodiesel growth;
2. Ethanol shortening.





The General Policies for Biofuels

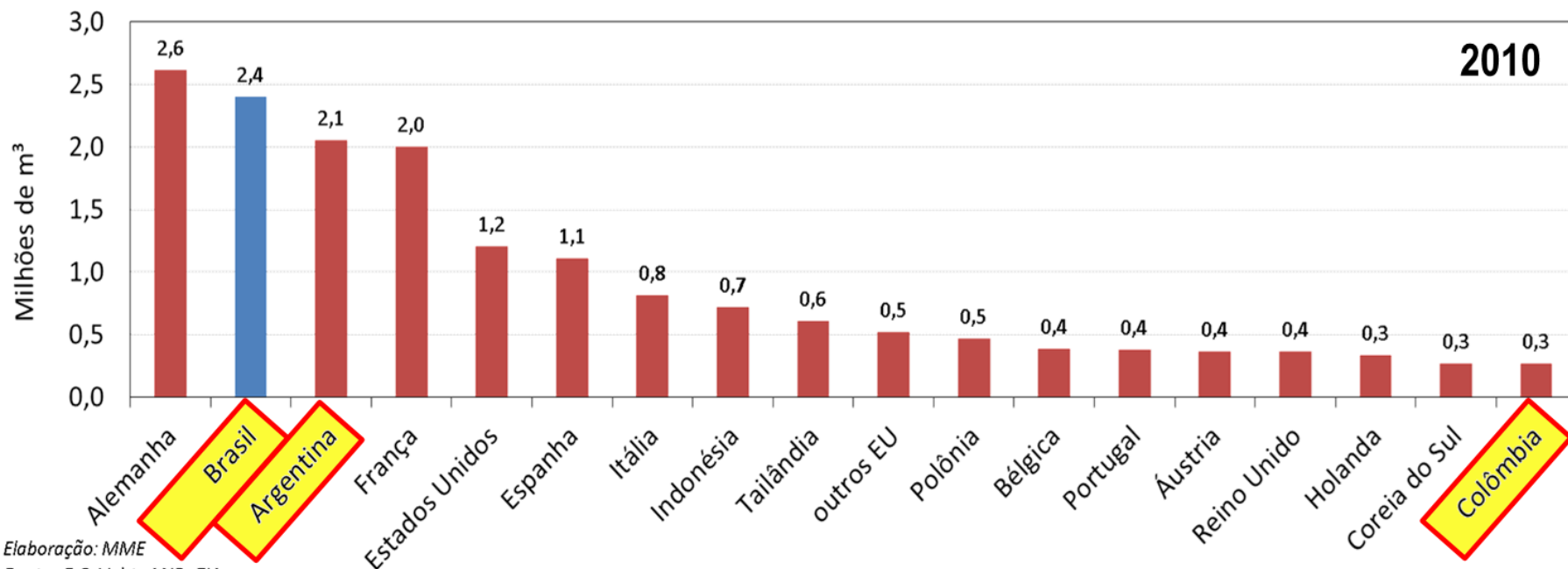
The law of Brazilian energy policy includes as one of the objectives: to increase the share of biofuels in the national energy mix. The main general instruments include:

- ✓ **Mandatory mix: ethanol (E18-25) and biodiesel (B5).**
- ✓ **Tax differentiation regime in federal level.**
- ✓ **Line of credit for ethanol strategic buffer stocks (conceived to improve off-season supply conditions).**
- ✓ **Public auctions for biodiesel market supply.**
- ✓ **Research funding (CT-Petro, created in 1999 and CT-Energ, created in 2000).**
- ✓ **Agro-ecological zoning that orients and guarantees that raw-material production will take place only in suitable areas. The Brazilian government managed to conclude the sugarcane (2009) and palm oil (2010).**



WORLD BIODIESEL PRODUCTION

	2007	2008	2009	2010	2011(*)	
Europa	6,9	8,4	10,0	10,4	10,2	51%
América	2,7	5,3	5,4	6,1	7,8	39%
Ásia	0,7	1,7	1,8	2,1	2,2	11%
Oceania	0,0	0,1	0,1	0,2	0,2	1%
Mundo	10,4	15,3	17,2	18,4	20,1	100%



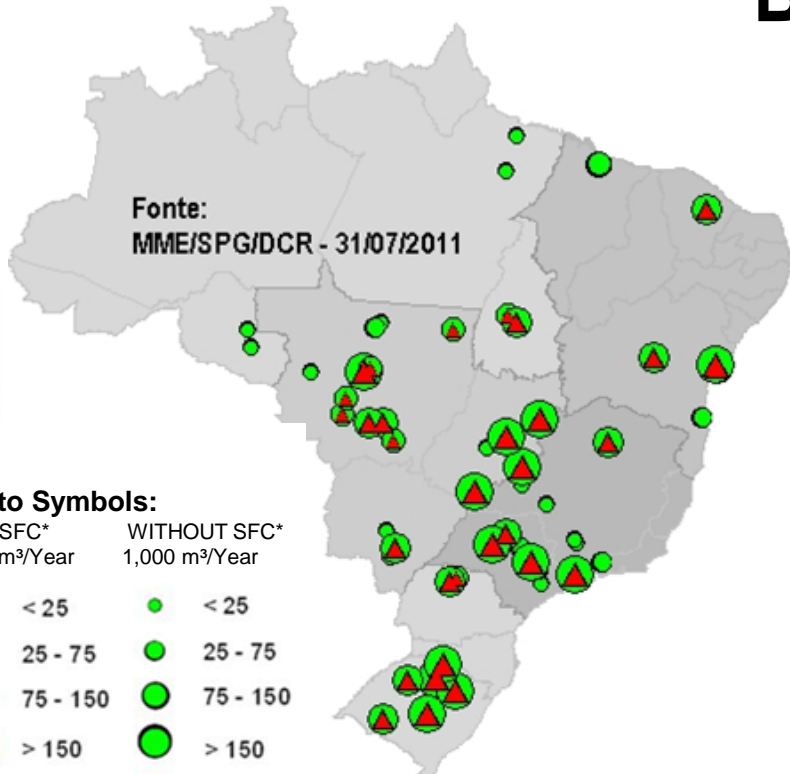


Biodiesel Policies

- ✓ **The mandatory policy of B5 is the most important incentive;**
- ✓ **Tax policy regime that differentiates the region and also the type of agriculture that provides raw material;**
- ✓ **Social Fuel Certificate (SFC) is the mechanism that stimulate the development of small agriculture and tries to include their raw-material production in biodiesel chain;**
- ✓ **The biodiesel producer that owns a SFC is allowed to take part in biodiesel auctions competing for 80% of the volume;**
- ✓ **The government is trying to design policies to induce the diversification of raw-materials for biodiesel production (palm oil, jatropha etc.).**



Biodiesel Production in Brazil



Key to Symbols:

WITH SFC* 1,000 m³/Year WITHOUT SFC* 1,000 m³/Year

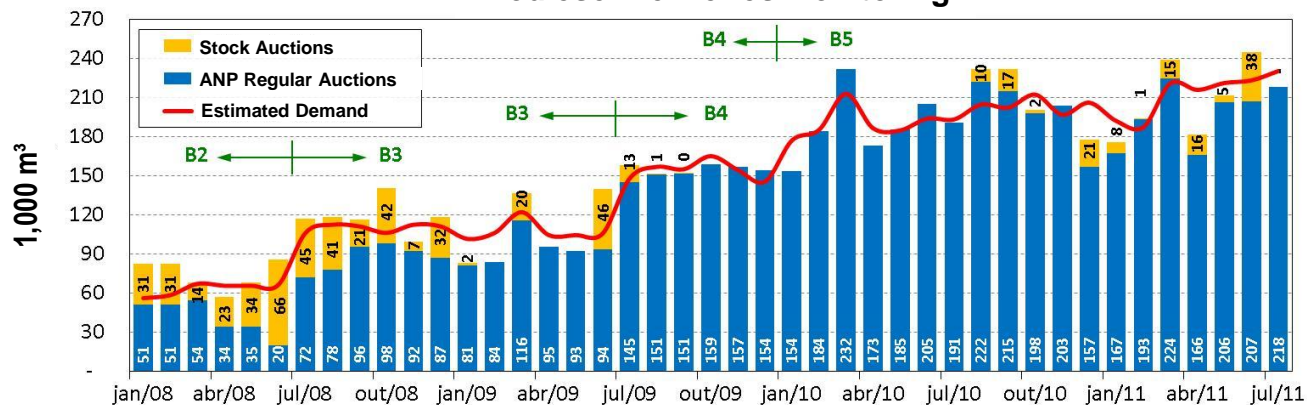


(*) Social Fuel Certificate

Region	# units	Installed Capacity	
		thousand m ³ /year	%
N	6	193	3%
NE	6	741	13%
CO	25	2.252	39%
SE	13	1.101	19%
S	9	1.544	26%
Total	59	5.831	100%

OBS: Position in 07/31/2011

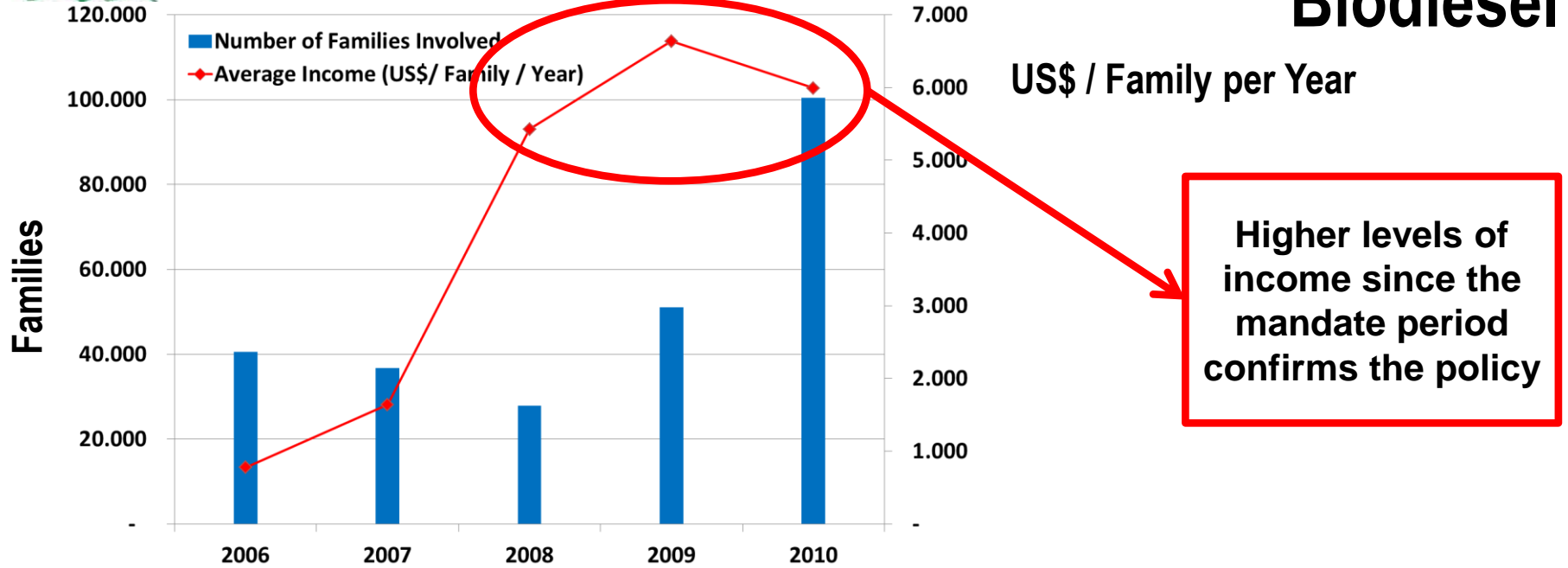
Biodiesel Deliveries Monitoring



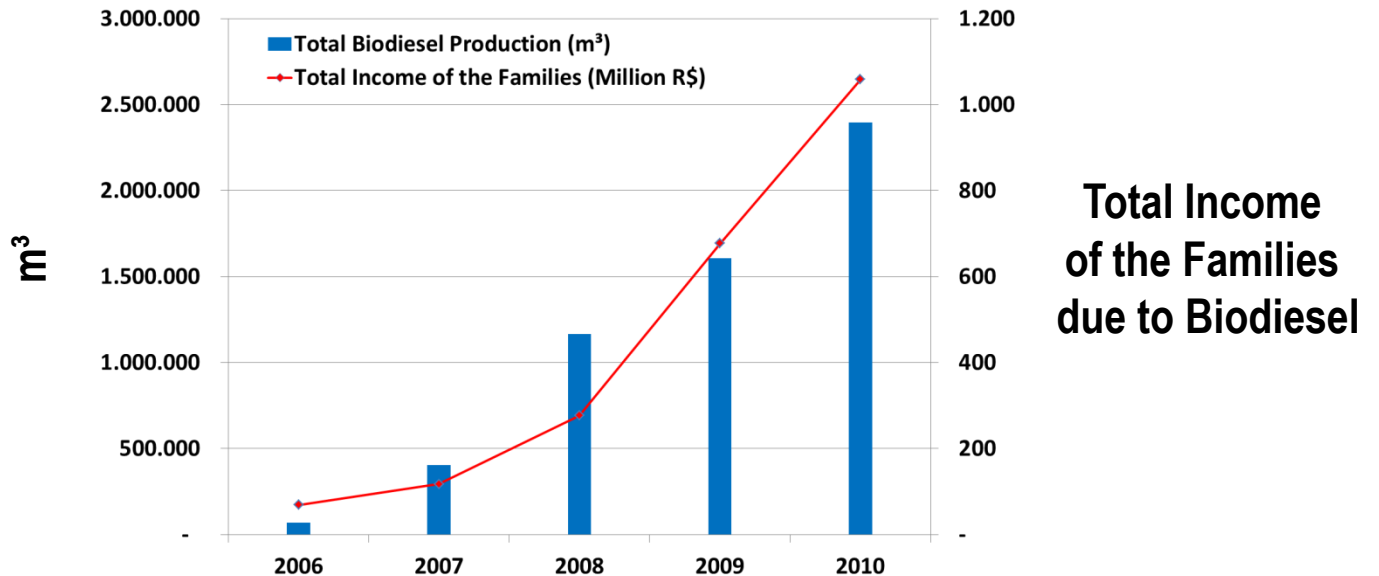
Elaboration: MME (2011)
Sources: ANP, Petrobras, REFAP



Biodiesel



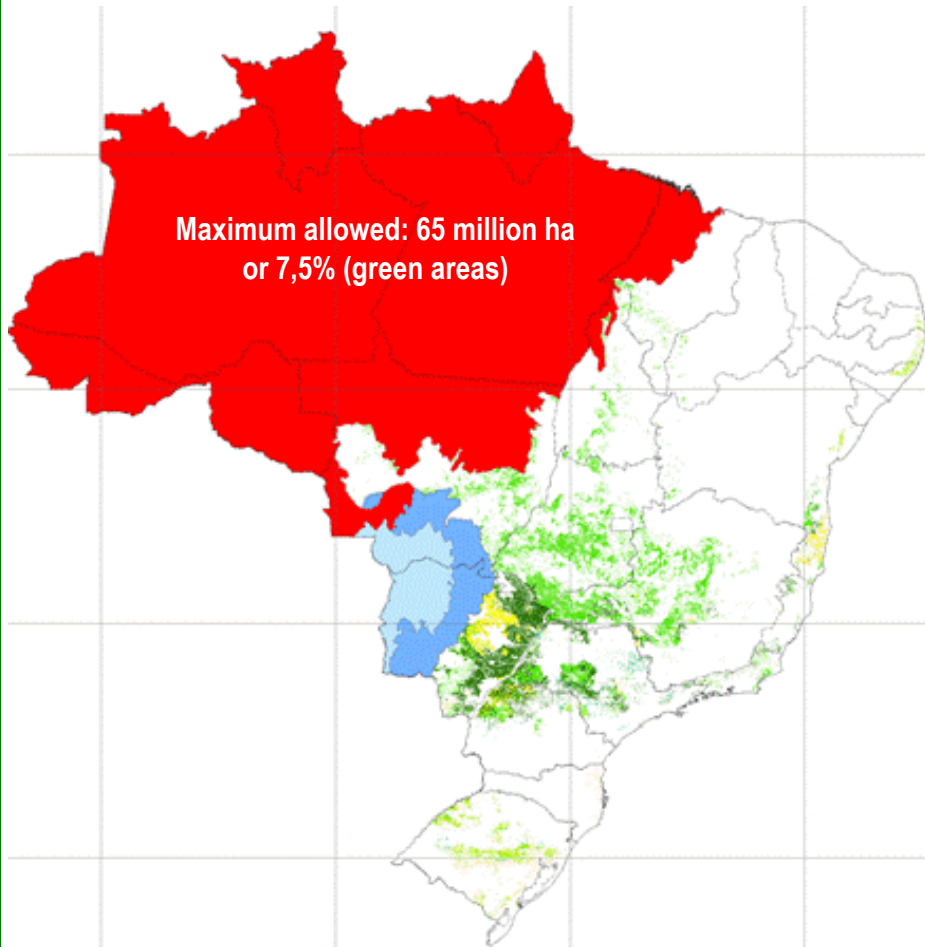
Total Biodiesel Production





Agricultural zoning as a guarantee for public and private investments and a recommendation of suitable areas for harvest

Sugarcane Expansion with Agroecological Requirements

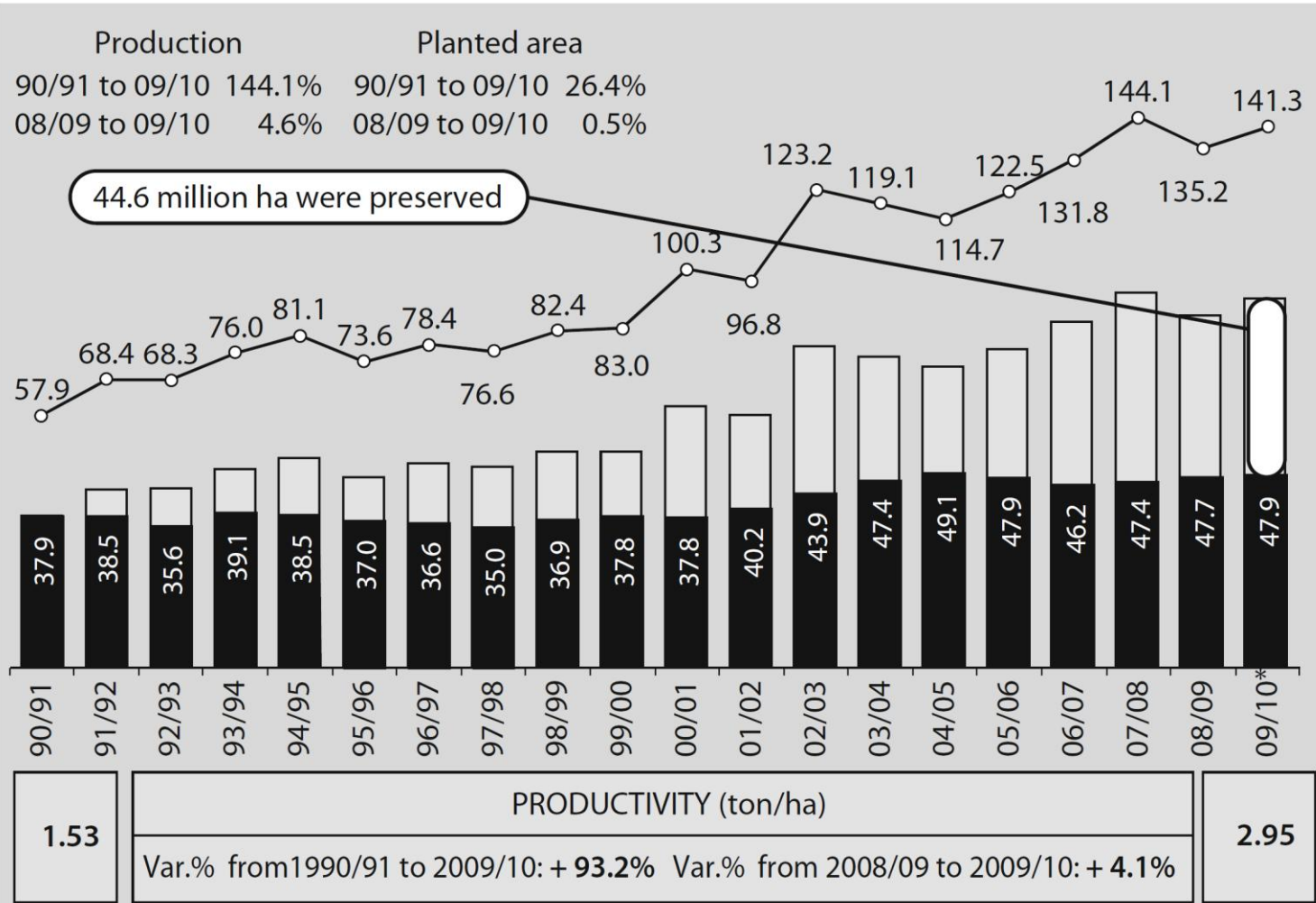


Agrozoning for Soy, Sunflower, Castor, Palm, Cotton Seed etc.



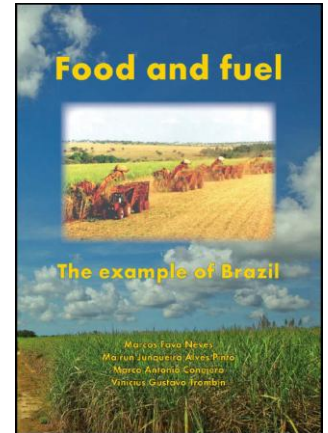


Food versus Fuel: The Evolution of Brazilian Yield



Includes: Maize, Rice, Soybean, Wheat and Sugarcane

CONAB Data – Elaborated by GV-Agro (in “Food and Fuel – The Example of Brazil”)





What is the role of Governments?

- ✓ **Maintain the best environment for investments with a clear regulatory framework;**
- ✓ **Articulate the different, but legitimate, interests involved;**
- ✓ **Assure the proper incentives to best practices;**
- ✓ **Pursue the most sustainable path to expand the industry and promote development;**
- ✓ **Give ways to assure and respect contracts;**
- ✓ **Induce/ facilitate (international) trade;**
- ✓ **Correct market distortions that might lead in long term to imbalances in economic activity.**



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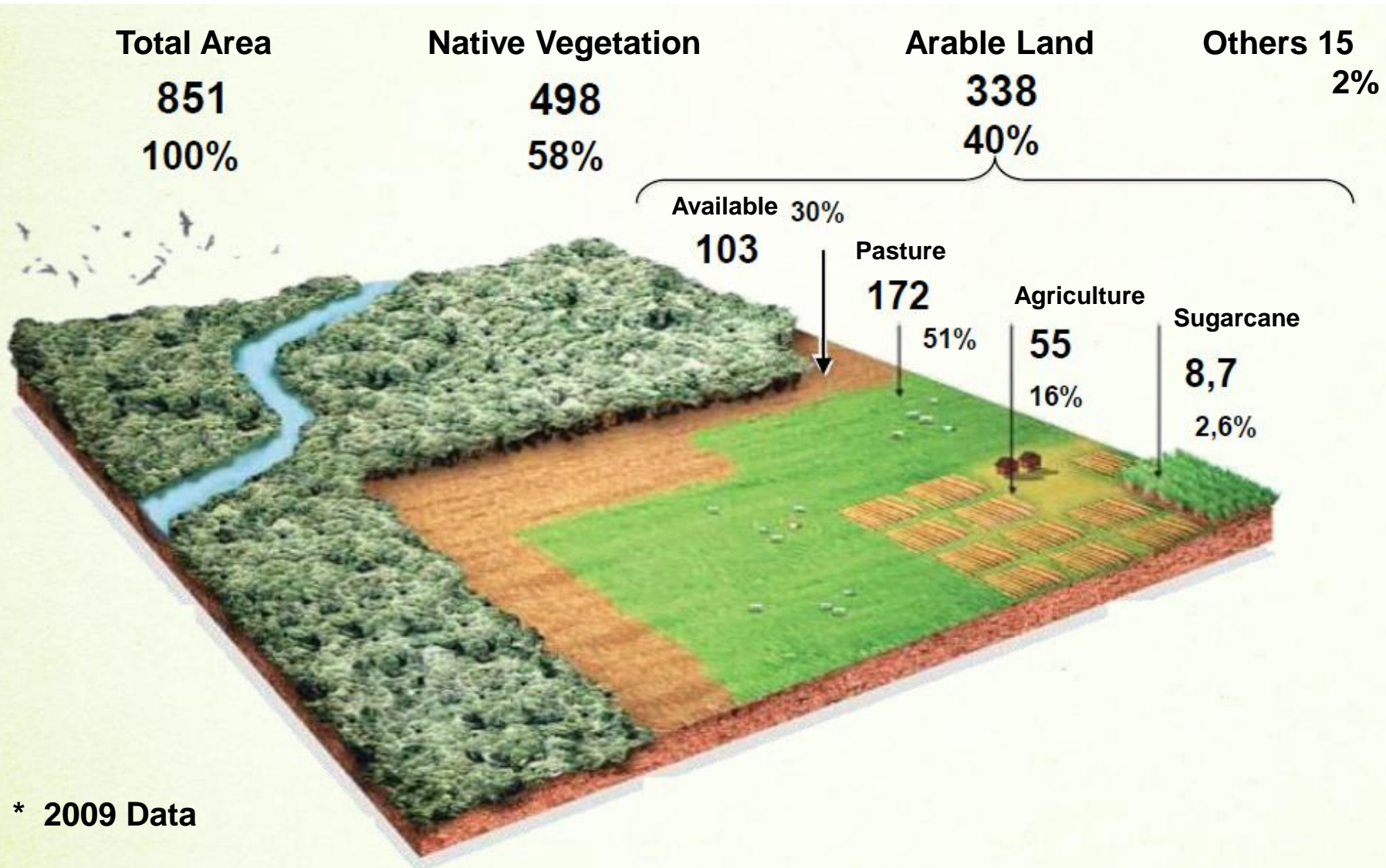
Thank You!

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Land Use in Brazil *



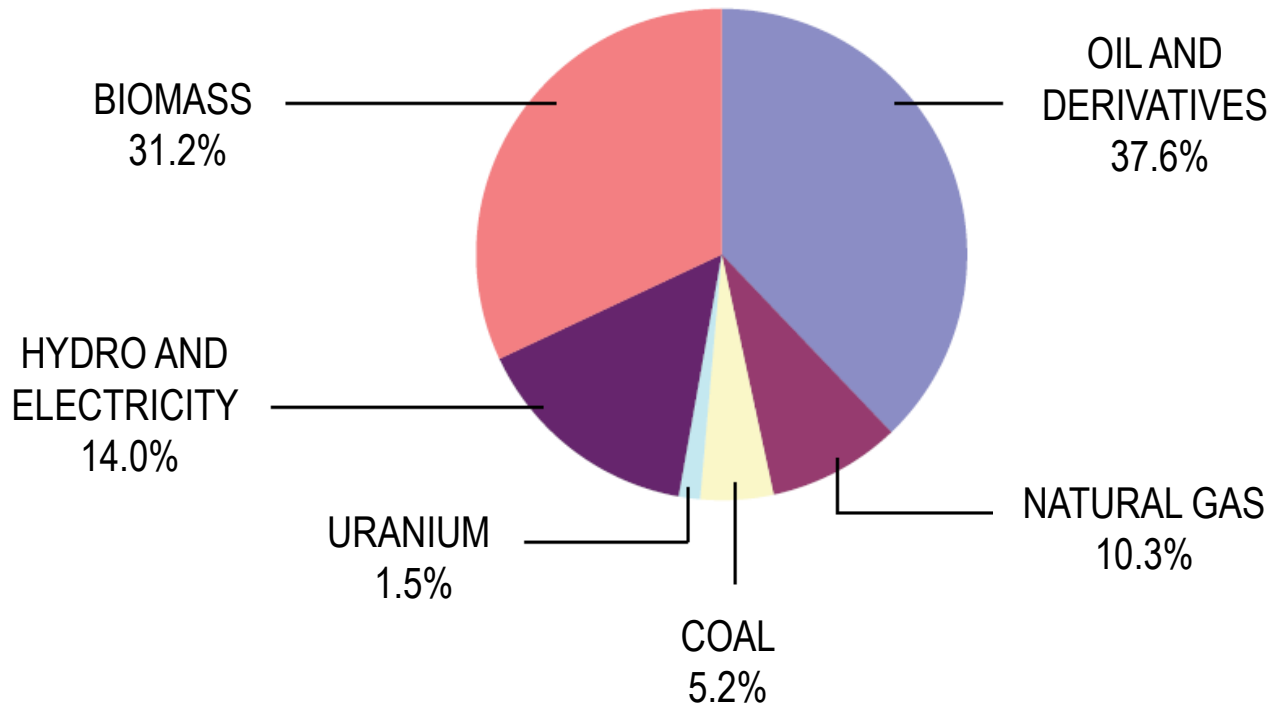
* 2009 Data



Energy Data - Brazil 2010

Domestic Energy Supply

267.4 million tep (2% of world energy)



BIOMASS:

WOOD: 9.7%

SUGARCANE PRODUCTS: 17.8%

OTHER: 4.0%

RENEWABLES:

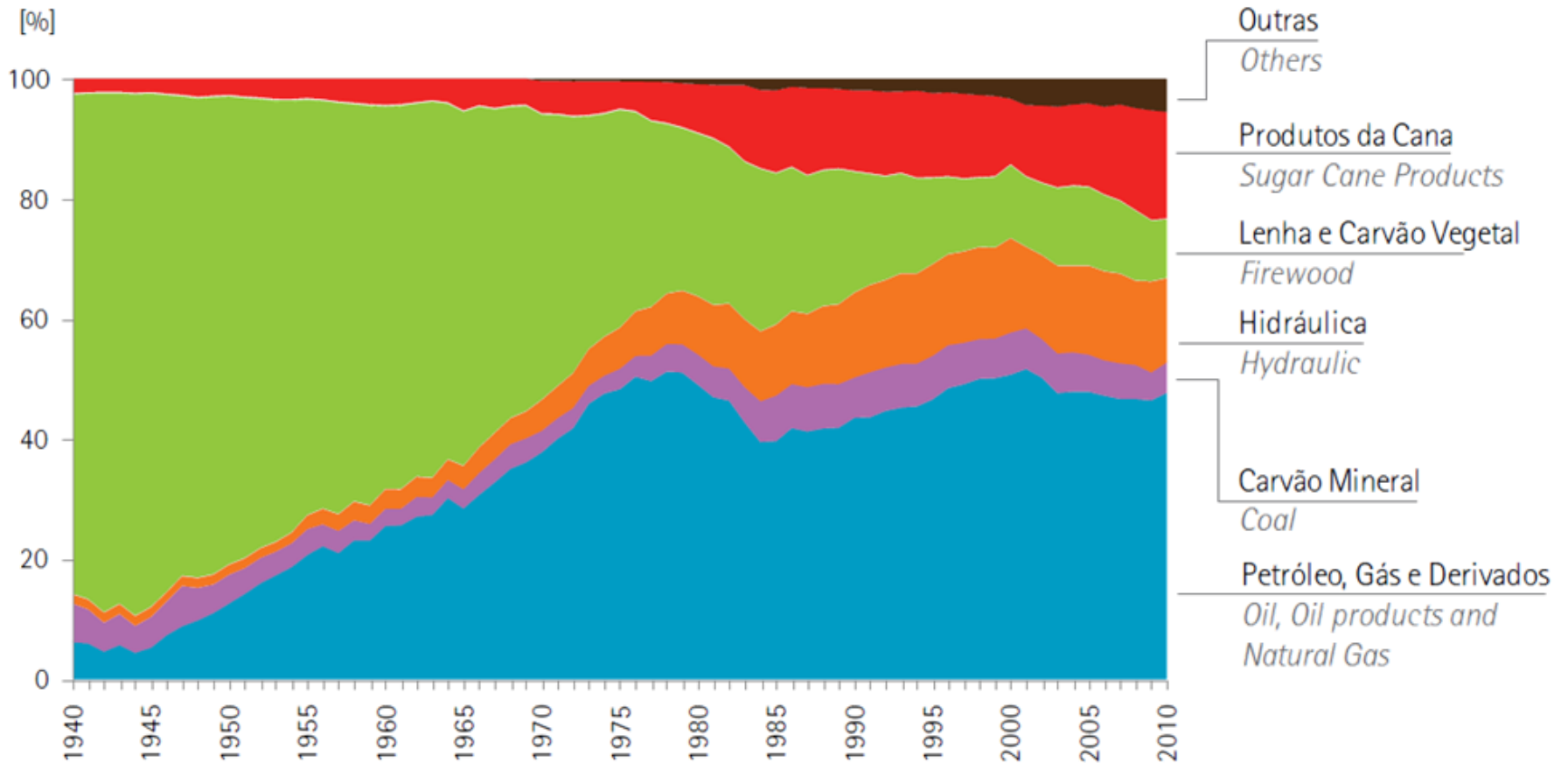
BRAZIL: 45.3%

OECD: 7.2%

WORLD: 12.9%



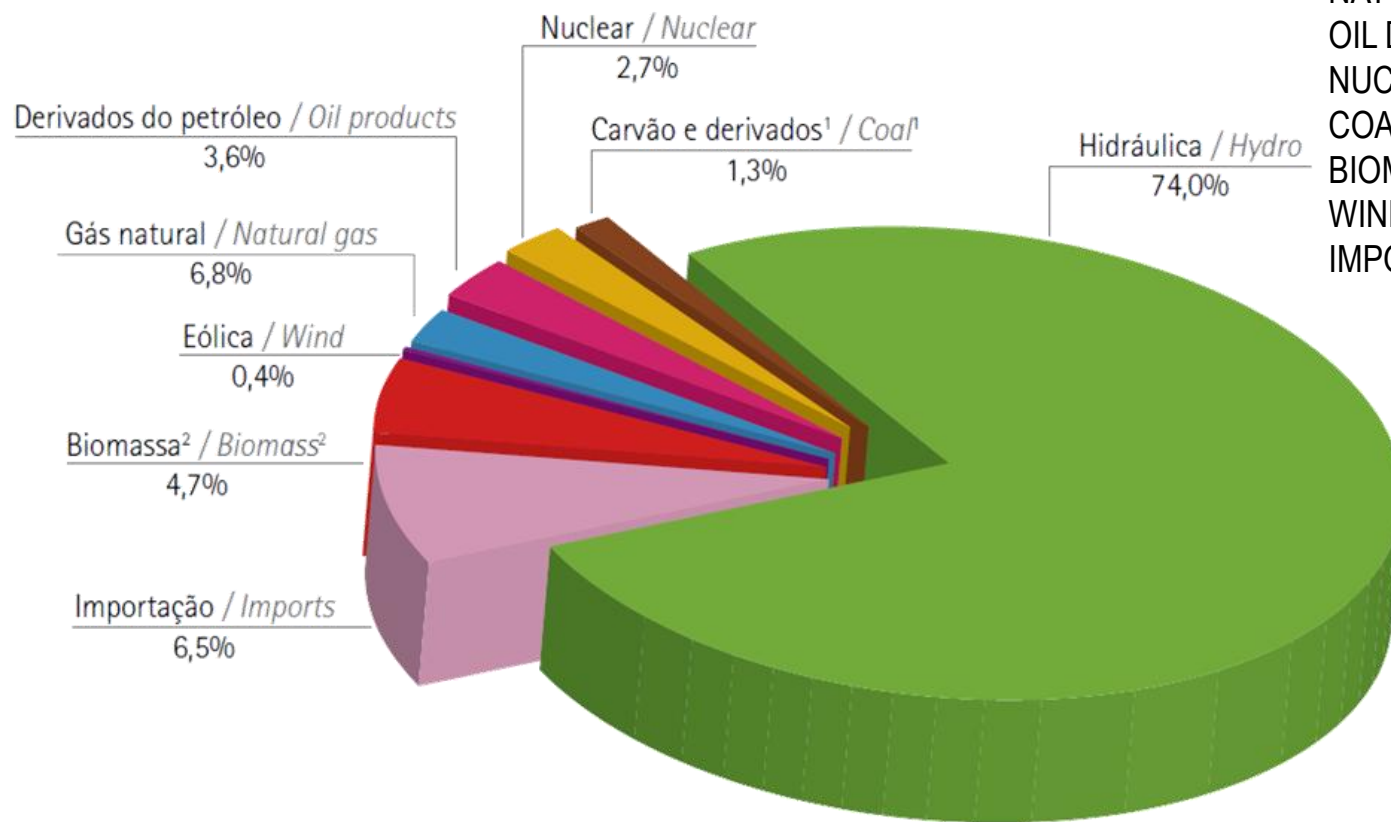
Energy Data - Brazil 2010





Energy Data - Brazil 2010

Domestic Electric Energy Supply



TWh	
TOTAL	509.2
HYDRO:	376.8
NATURAL GAS:	34.6
OIL DERIVATIVES:	18.3
NUCLEAR:	13.7
COAL:	6.6
BIOMASS:	23.9
WIND:	2.0
IMPORTS:	33.1

RENEWABLES:

BRAZIL: 85.8%
OECD: 16.6%
WORLD: 18.7%

Notas/ Notes:

1 Inclui gás de coqueria/ Includes coke gas.

2 Biomassa inclui lenha, bagaço de cana, lixívia e outras recuperações/ Biomass includes firewood, sugar cane bagasse, black liquor e other wastes.