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Brazil LCS Scenarios

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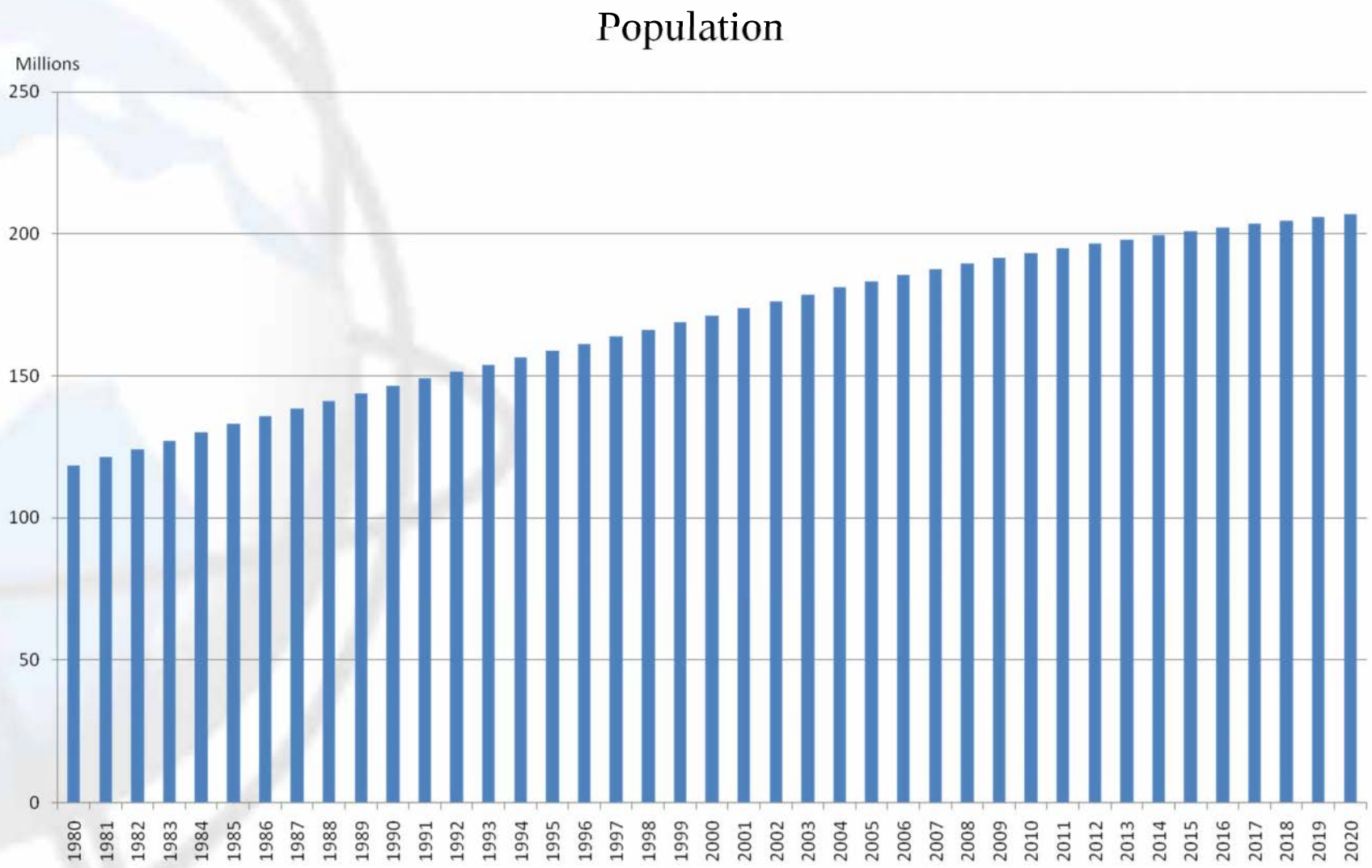
1. Background

	2000	2005	2009	2020
Population, total	171.3 million	183.4 million	191.5 million	207.1 million
Population growth (annual %)	1.48	1.25	0.98	0.57
GDP per capita (2009 US$)	6,908	7,402	8,234	13,022.9
GDP (2009 US$)	1,183.4 billion	1,357.5 billion	1,576.9 billion	2,697 billion
GDP growth (annual %)	4.3	3.1	-0.2	5.0

Source: BEN, 2010; IBGE, 2008

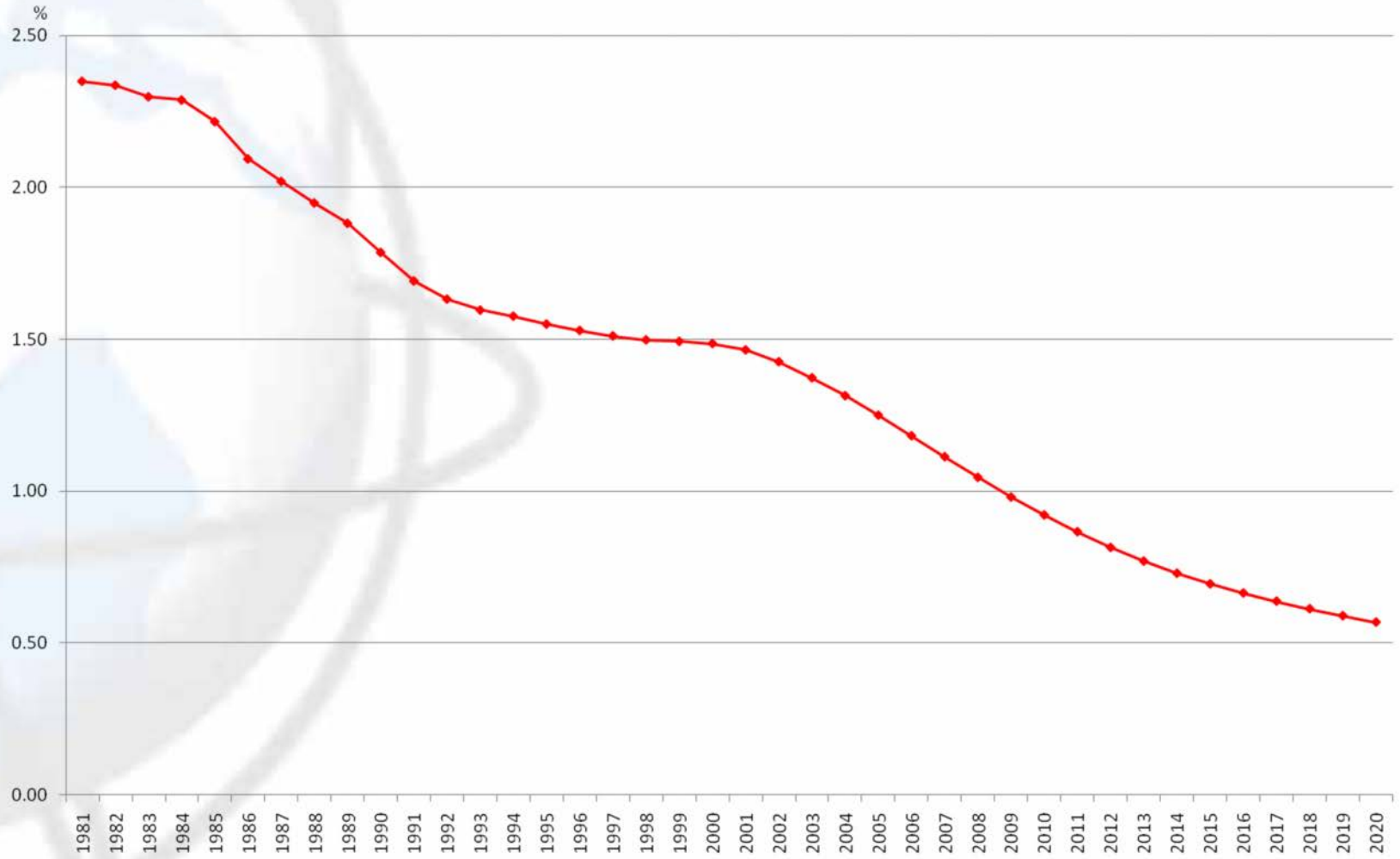
1. Background



Source: IBGE, 2008

1. Background

Growth Rate

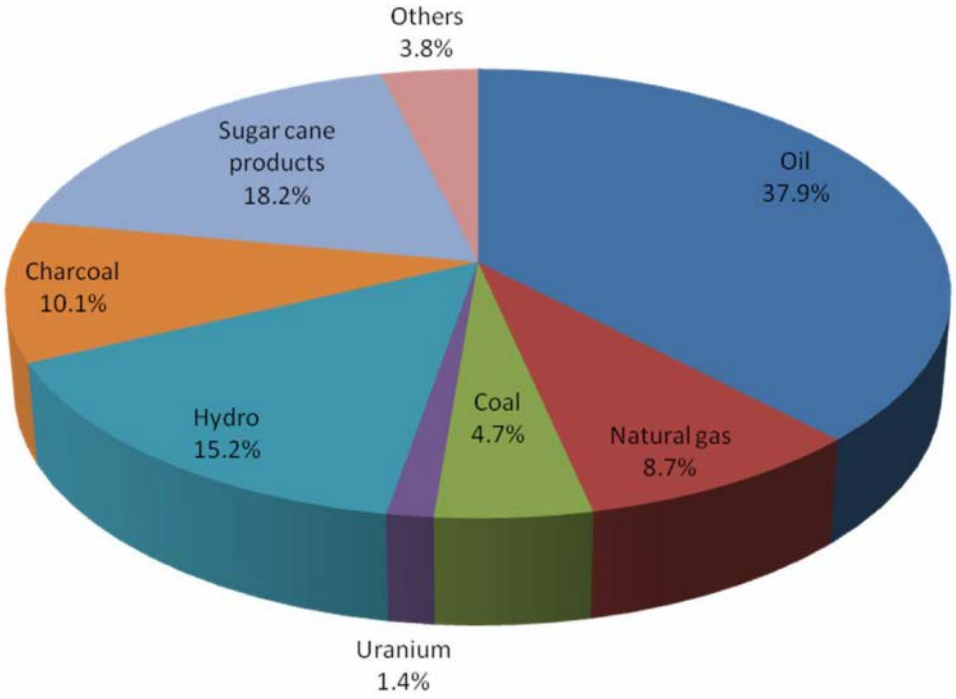


Source: IBGE, 2008

1. Background

Total Energy Consumption - 2009

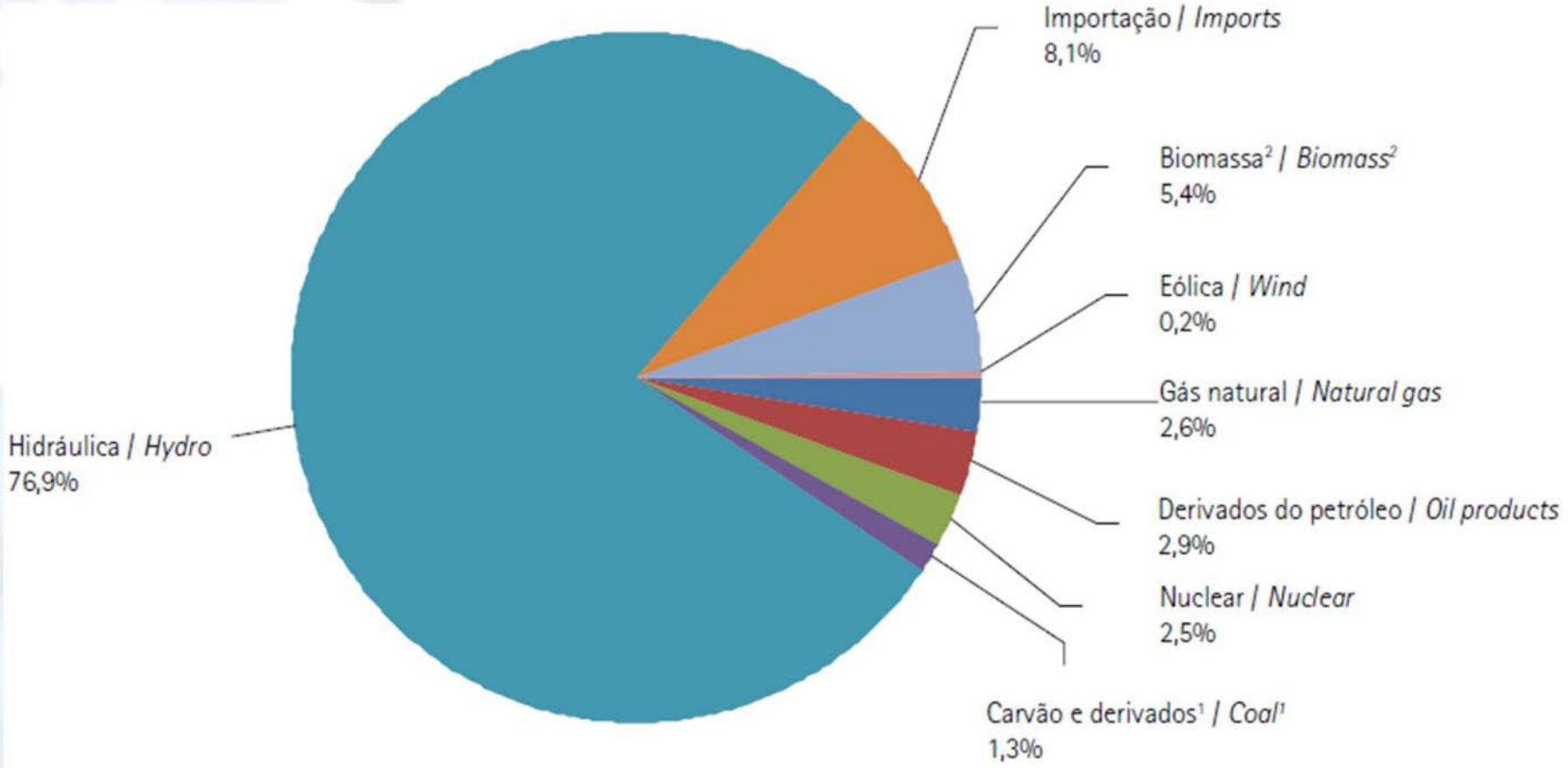
47% of renewable energy!



Source: BEN, 2010

1. Background

Electricity



- 0,0511 tCO_2/MWh in 2010 (up to November)

Source: BEN, 2010; MCT, 2010

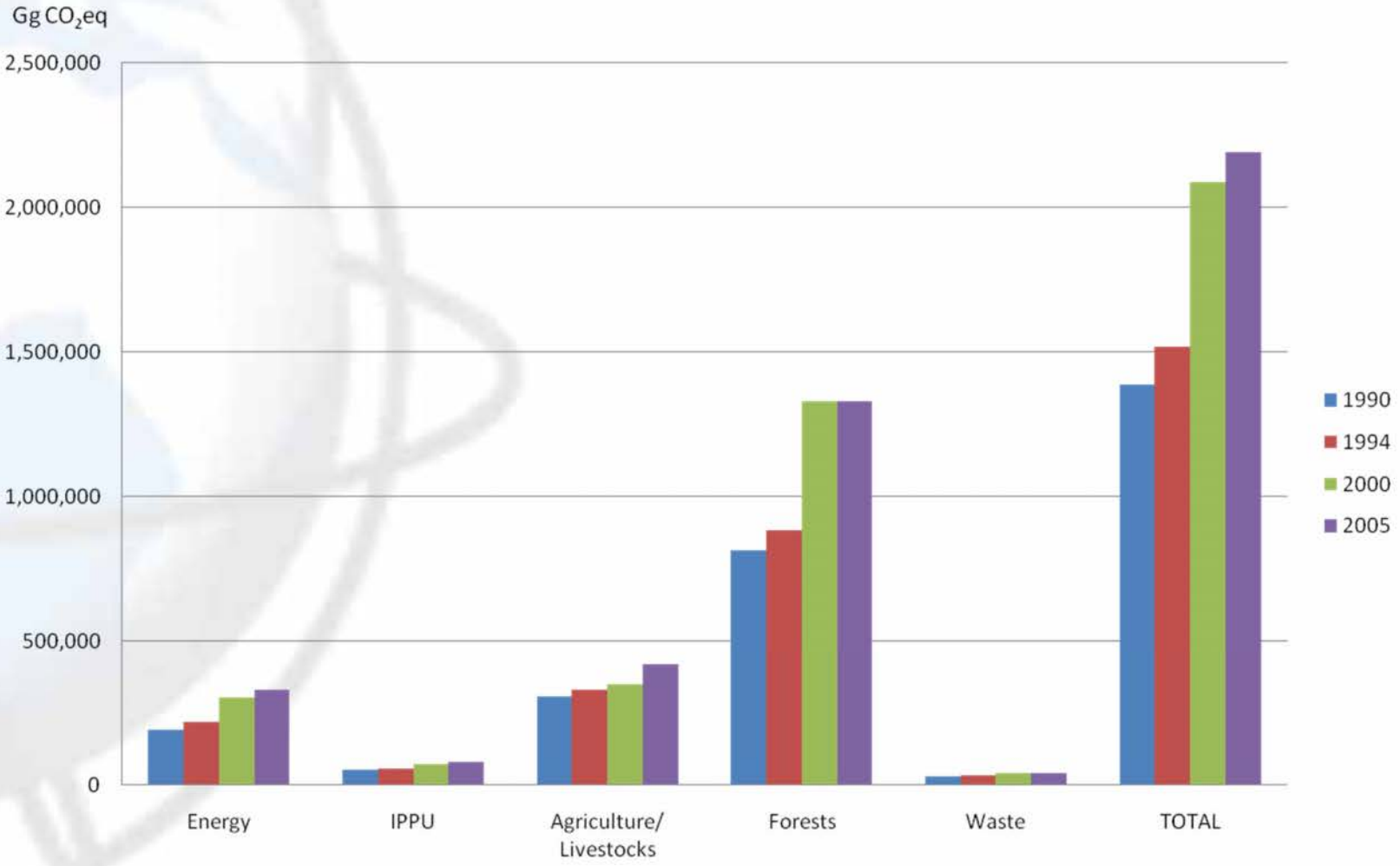
2. Second National Communication

GHG Emissions Mt CO_2eq	1990 Data	1994 Data	2000 Data	2005 Data	Variation (%) 90/05	Share (%) 1990	Share (%) 2005
Land Use Change	813	883	1,328	1,329	63%	58.61%	60.63%
Agriculture/ Husbandry	304	329	348	415	36%	21.92%	18.93%
Energy	191	217	301	329	72%	13.77%	15.01%
IPPU	51	57	71	78	53%	3.68%	3.56%
Waste	28	32	39	41	46%	2.02%	1.87%
TOTAL	**1,387**	**1,518**	**2,087**	**2,192**	**58%**	**100%**	**100%**

Source: MCT, 2010

2. Second National Communication

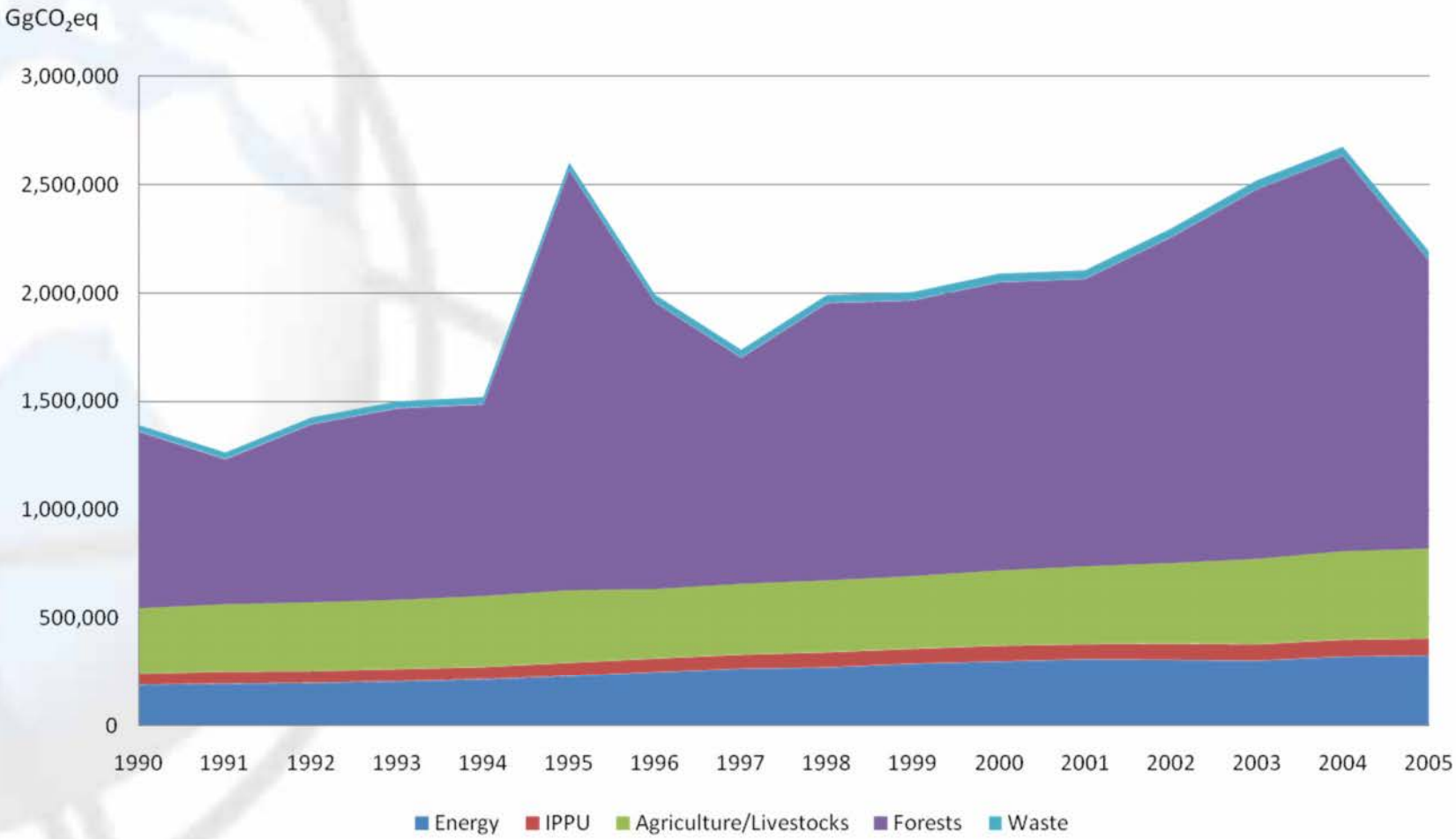
Total Emissions (1990-2005)



Source: MCT, 2010

2. Second National Communication

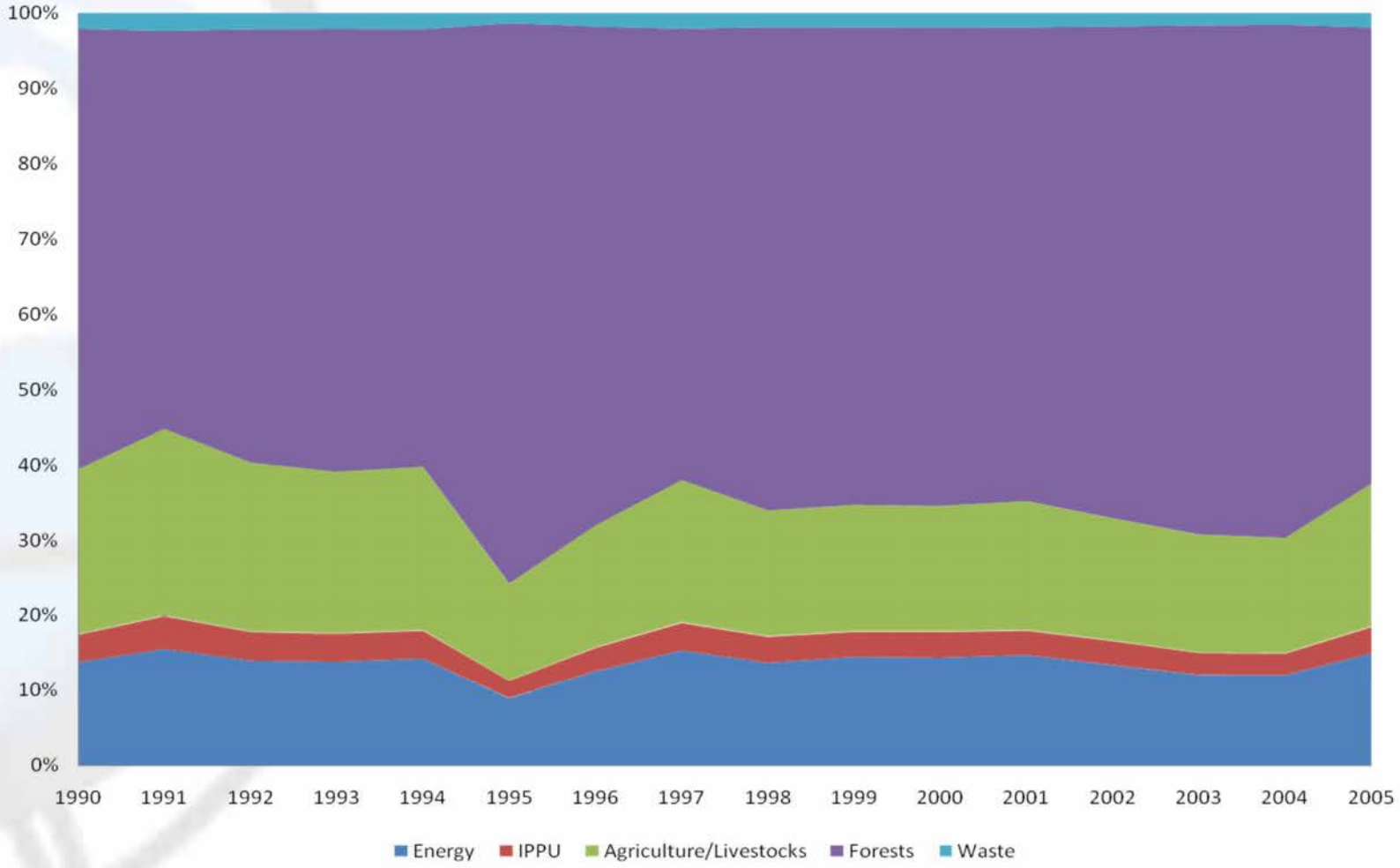
Total Emissions ($GgCO_2eq$)



Source: MCT, 2010

2. Second National Communication

Total Emissions (%)



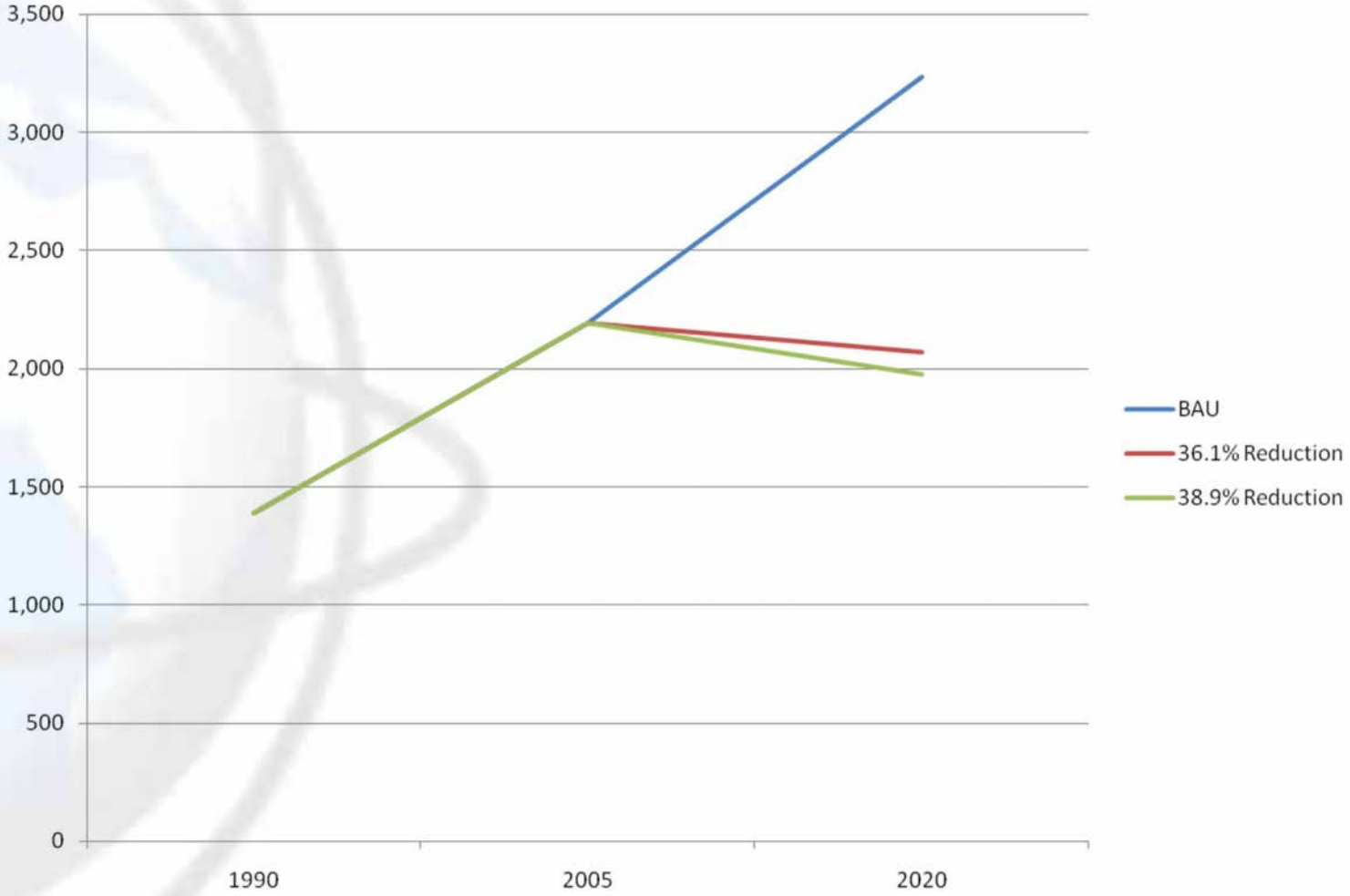
Source: BEN, 2010

3. Voluntary Mitigation Goals in 2020

GHG Emissions / Mitigation Actions Million tons CO_2eq/y	1990 Data	2005 Data	Variation 1990-2005	2020 BAU Scenario	Variation 2005-2020	Avoided Emissions in 2020
Land Use Change	813	1329	63%	1404	5.6%	
Amazon				948		
Savannahs				323		
Others				133		
Agriculture/Husbandry	304	415	36%	730	76%	
Energy	191	329	72%	868	164%	234
IPPU+Waste	79	119	51%	234	96%	
TOTAL	**1,387**	**2,192**	**58%**	**3,236**	**47%**	**1,168-1,259**

Source: MCT, 2010; Federal Decree 7,390/2010

3. Voluntary Mitigation Goals in 2020



Source: MCT, 2010; Federal Decree 7,390/2010

3. Voluntary Mitigation Goals in 2020

Overview

- Federal Decree 7,390: a step towards detailing the voluntary mitigation goals established by the government, but still leaves a lot of flexibility to the actual way of achieving these goals.

- Only the energy sector has already established the amount of avoided GHG emissions in 2020: 234 $MtCO_2eq$.

- It includes a number of efforts to increase the role of renewables, nuclear and energy efficiency in the energy policy.

3. Voluntary Mitigation Goals in 2020

Overview

- For the other sectors, there are four other sectoral mitigation plans already elaborated:
  - Plan of Action for Prevention and Control of Deforestation in the Amazon – PPCDAm;
  - Plan of Action for Prevention and Control of Deforestation and Fires in the Savannahs – PPCerrado;
  - Plan for Consolidation of a Low Carbon Emission Economy in Agriculture;
  - Plan of Emission Reduction in the Steel sector.

4. Brazil's Mitigation Policy Tools

Energy

- Driving forces such as economic growth, the rising urbanization and the dominance of road transportation in the country tend to increase fossil energy consumption and the associated CO_2 emissions.

- Therefore, emissions due to the use of fossils fuels (oil products, natural gas and coal) have been increasing significantly in Brazil, including its share in the power generation.

- As a result, GHG emissions due to the use of energy, especially CO_2 resulting from burning fossil fuels grew 72% in the period between 1990 and 2005.

4. Brazil's Mitigation Policy Tools

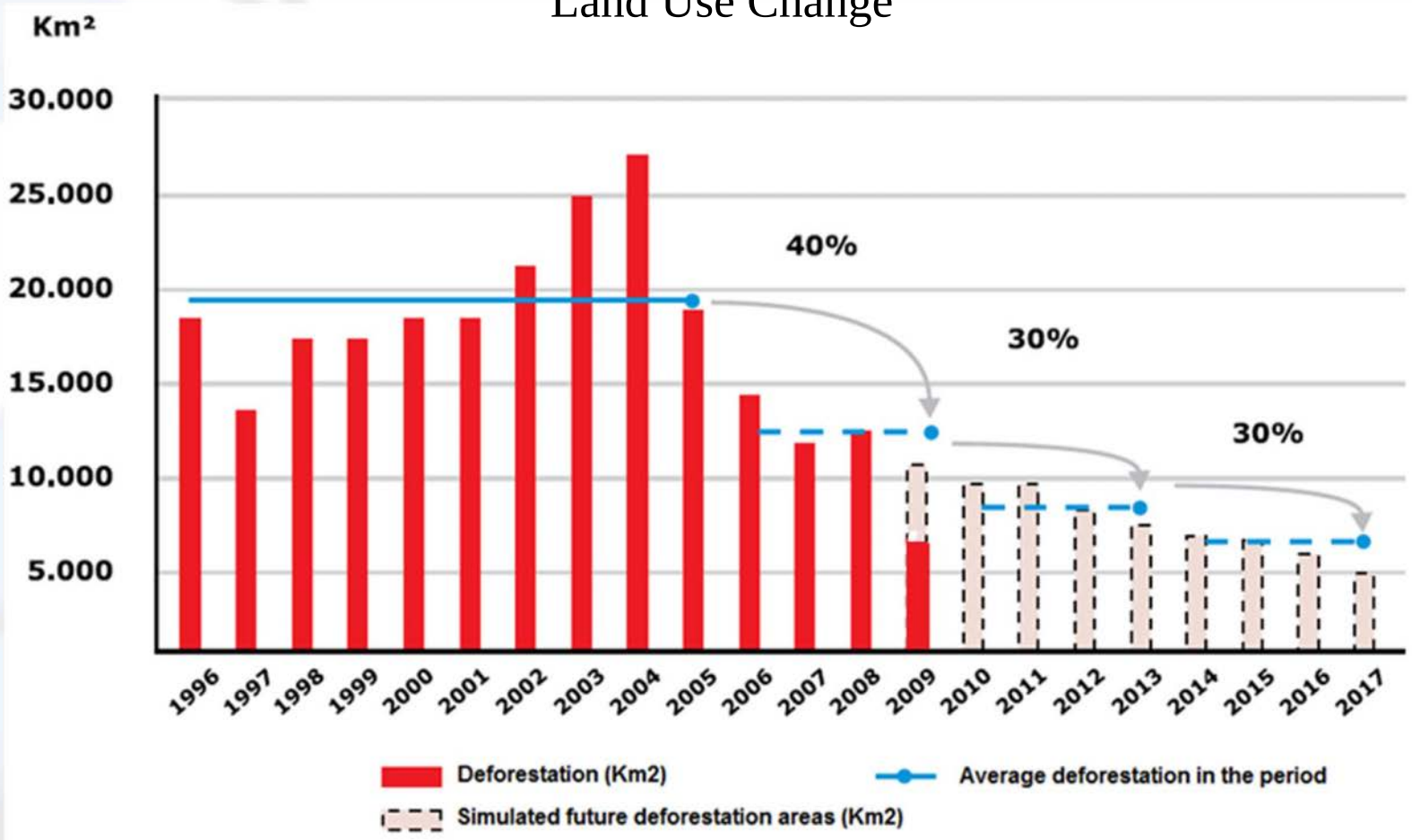
Land Use Change

- The main contribution to curb the country's GHG emissions will come from the efforts to reduce deforestation in the Amazon.

- Plan of Action for Prevention and Control of Deforestation in the Amazon – PPCDAm:
  - Reduction in 80% of the annual deforestation surface in the Amazon, compared to the historical average in the period 1996-2005 (1.95 M ha/year).
  - Average biomass density of 132 tC/ha (484 tCO_2/ha).
  - The projected BAU emission level is 948 M tCO_2 in 2020.
  - Assuming a constant biomass density, this decrease in the Amazon deforestation rate leads to avoided emissions of 758 $MtCO_2$/y in 2020.

4. Brazil's Mitigation Policy Tools

Land Use Change



Historical deforestation rates of the Amazon Forest and future deforestation reduction goals.

4. Brazil's Mitigation Policy Tools

Land Use Change

- Plan of Action for Prevention and Control of Deforestation and Fires in the Savannahs – PPCerrado:

  - Reduction in 40% of the annual deforestation surface in the savannahs, compared to the historical average in the period 1999-2008 (1.57 M ha/year).
  - Average biomass density of 56 tC/ha (206 tCO_2/ha).
  - The projected BAU emission level is 323 $MtCO_2$ in 2020.
  - Assuming a constant biomass density, this decrease in the savannahs deforestation rate would allow for avoided emissions of 129 $MtCO_2$/y in 2020.

4. Brazil's Mitigation Policy Tools

Agriculture/Husbandry

- Very ambitious goal, considering the recent growth of the country's grains and meat exports.

- Economically feasible mitigation alternatives already exist and have a great potential.

- Plan for Consolidation of a Low Carbon Emission Economy in Agriculture:

    - Increase in 4 million hectares of the land covered by agroforestry schemes, coupled with more intensive cattle raising activities (integrated agriculture / husbandry / forestry activities). The current average ratio of 0.5 heads per hectare is very low;

4. Brazil's Mitigation Policy Tools

Agriculture/Husbandry

- Recovery of 15 million hectares of degraded pasture land;
- Increase in 8 million hectares of the planted area under low tillage techniques;
- Increase in 5.5 million hectares of areas cultivated with biologic nitrogen fixation techniques replacing the use of nitrogenous fertilizers;
- Increase in 3 million hectares of forest plantations.

4. Brazil's Mitigation Policy Tools

IPPU + Waste

- Low growth trend even in the BAU scenario and voluntary commitments aim to keep roughly constant GHG emissions in these sectors.

- There are feasible mitigation options in these sectors:

  - Increase in 4.4 million cubic meters the use of technologies for proper treatment of animal wastes;

  - Plan of Emission Reduction in the Steel sector:

    - Increase steel manufacturing using charcoal from planted forests and improve the efficiency of charcoal kilns.

5. Next Steps

Monitoring and reporting

- Total emissions in 2020:
  - From 47.6% growth in BAU to 5.6-8.9% decrease compared to 2005;
  - From 133% to 44-50% increase compared with 1990.
- Publication of annual estimates of emissions of greenhouse gases in Brazil for the purpose of monitoring compliance with the objectives of action plans for prevention and control of deforestation in the biomes and sectoral plans for mitigation and adaptation to climate change, starting in 2012.
- The Decree also establishes the deadline of 15 December 2011 for elaboration of additional sectoral mitigation plans for those sectors included in the Federal Law 12,187.

5. Next Steps

Capacity Building

- Brazil still have the challenge to increase the number of experts on the climate change science;

- The number of publications available in Portuguese in the relevant areas is still limited, and the human and financial resources to develop more comprehensive studies are still scarce;

- In 2010, the Ministry of Environment – MMA started an effort to increase these numbers, establishing a Brazilian Panel on Climate Change – PBMC.

- The result will be the Brazilian Climate Change Assessment Report, to be released in June 2012 during Rio+20.

Conclusions

- Comparing to developed countries, Brazil´s CO_2 emission per capita is low, and even in the BAU scenario it is projected to continue low:
  - 77% of Hydro in the power sector;
  - Deforestation levels are reducing.

- However, the share of fossil fuels in the energy matrix is growing. Thus, emissions due to the use of fossil fuels in the country will be 75% higher in the mitigation scenario compared to 2005 emissions.

- It will be required the implementation of public policy tools capable of stimulating the substitution of fossil fuels for the use of renewable energy sources.

Work in Progress

- National Scenarios (2050) for PNUMA;
- State of Rio de Janeiro Inventory and Scenarios (2030), for the State government
- City of Rio de Janeiro Inventory and Scenarios (2030), for the City government

THANK YOU!

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