



System for Estimation of GHG Emissions

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- Promoted by [Climate Observatory \(OC\)](#)
- Technical Coordination:



Energy and Industry



Agriculture



Waste



LULUCF

- Organization and Communication Support: [AVINA](#) and [FGV](#)
- Technology Partner: [Tracersoft](#)

- Funding:





SBDIMA –
Sociedade Brasileira de
Direito Internacional
do Meio Ambiente



Observer:



WORLD
RESOURCES
INSTITUTE



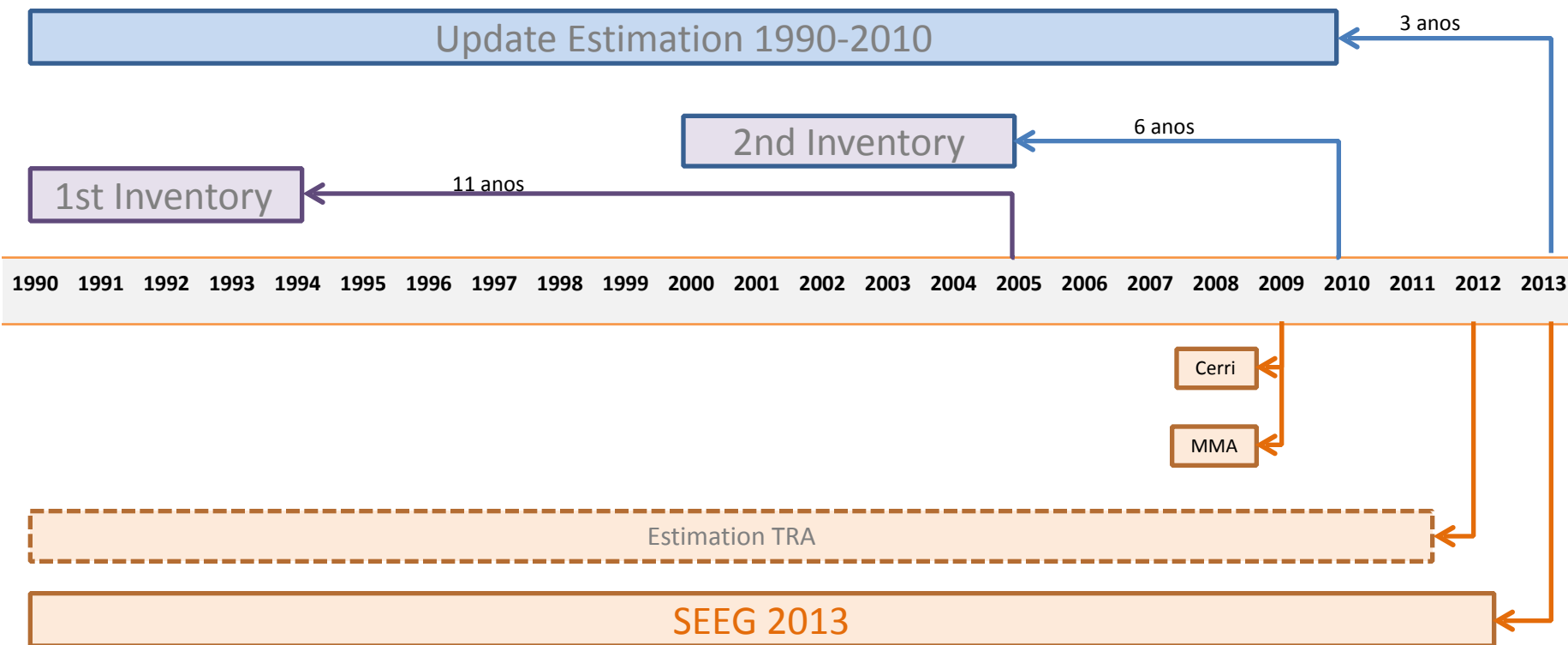
Purpose

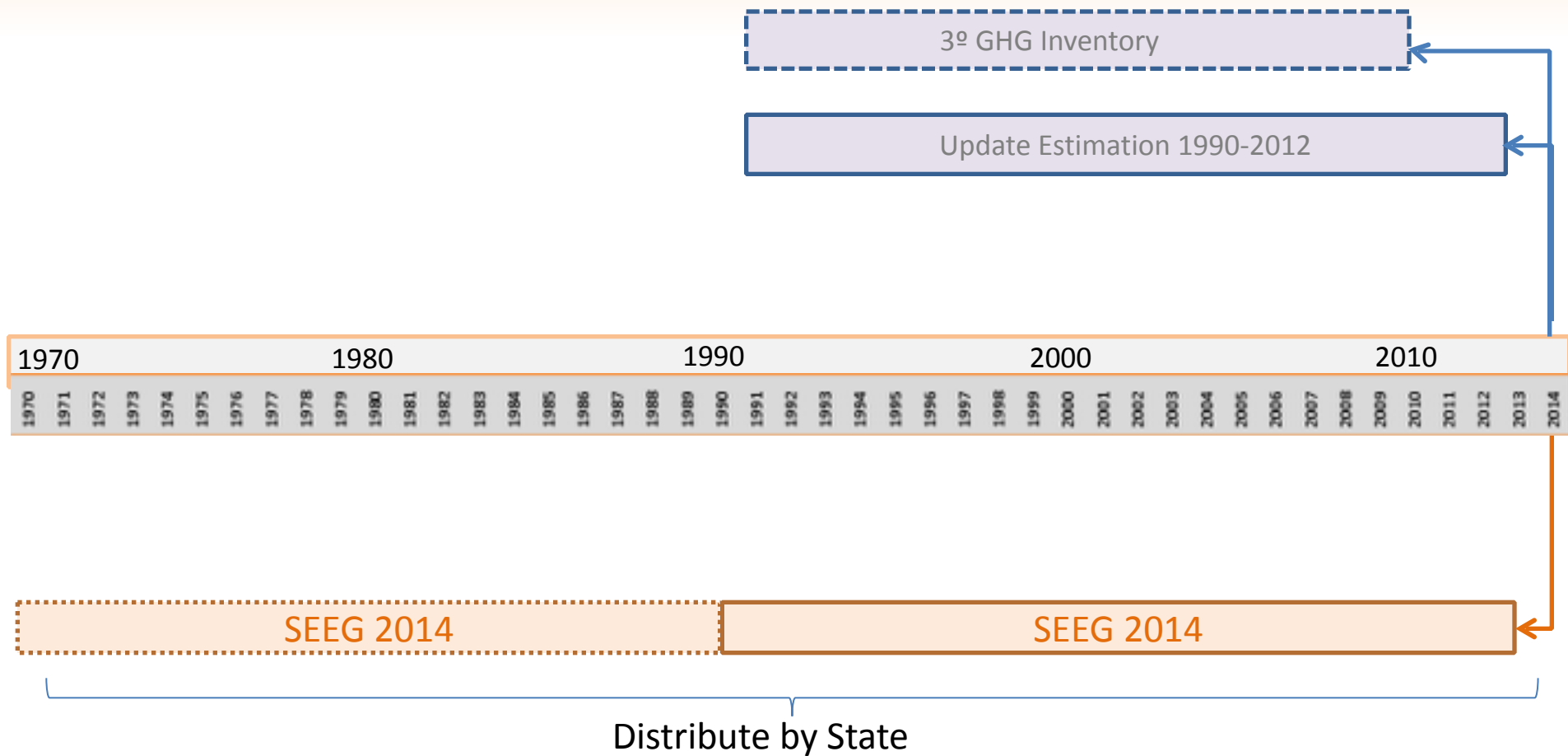
- **Produce and make available** **annual estimation of GHG** on an a **consistent** and **accessible** basis.
- **Increase the capacity of civil society** to **understand** and **anticipate trends** related to GHG emissions and it's **implications of public policy**.

Products

- **Annual Estimation of GHG** across all sector and gases.
- **Analytical Reports**
- **Web platform** spread the data, methodology and supporting documents.
- **Annual Technical Seminar**.

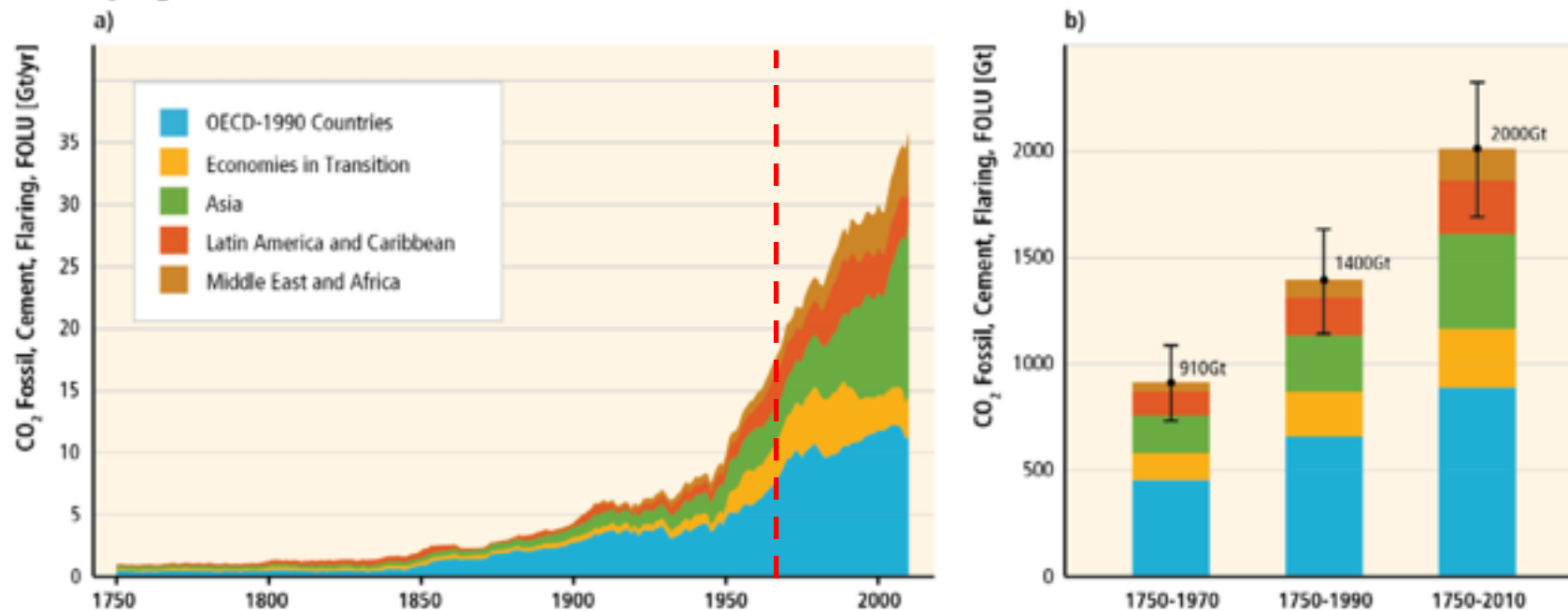






Why comeback to 70's

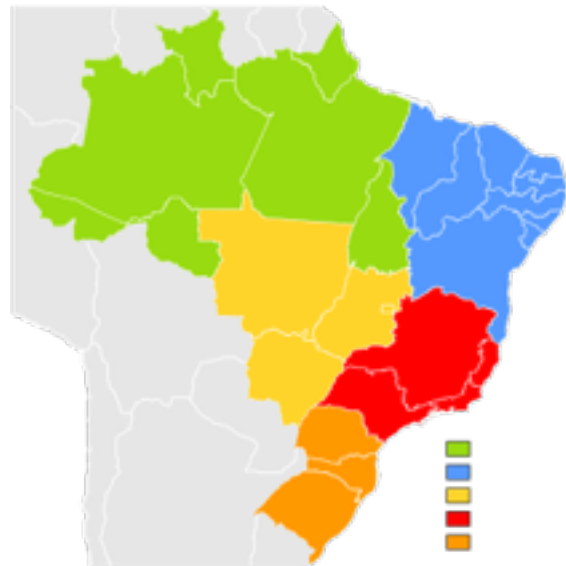
Total Anthropogenic CO₂ Emissions from Fossil Fuel Combustion, Flaring, Cement, as well as Forestry and Other Land Use (FOLU) by Region between 1750 and 2010



Fonte: IPCC (2013)



[illegible]



SEEG 2.0

1972 - 1989

1990 - 2013

Data Base

SEEG 1.0 100 thousand data points

SEEG 2.0 2 million data points





- Scope of gases

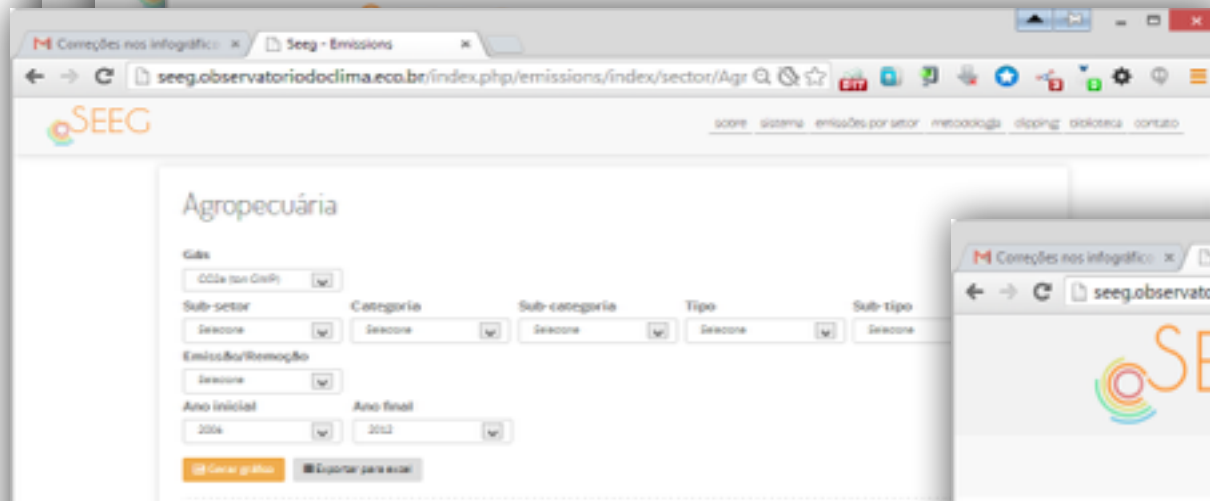
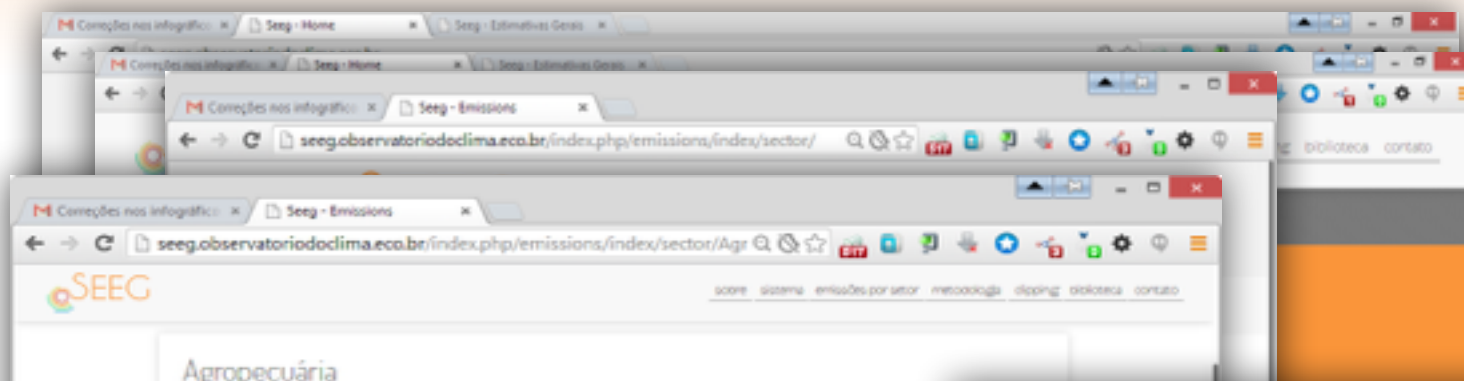
		Agriculture	Energy	Industrial process	Waste	Land Use Change	99%
GHG	CO ₂						
	CH ₄						
	N ₂ O						
	C ₂ F ₆						
	CF ₄						
	HFC 125						
	HFC 143a						
	HFC 152a						
	HFC 23						
	HFC 134a						
Precursors Gases	CO						
	NM VOC						
	Nox						



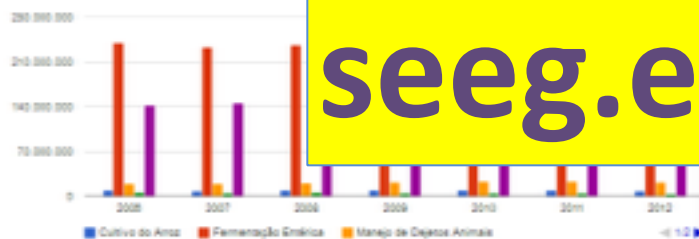
- Emissions, Removals and Bunker

	Sector	Emissions	Removals	Bunker
	<i>Energy</i>	X		X
	<i>Agriculture</i>	X		
	<i>Industrial Process</i>	X		
	<i>Waste Management</i>	X		
	<i>LULUCF</i>	X	X	





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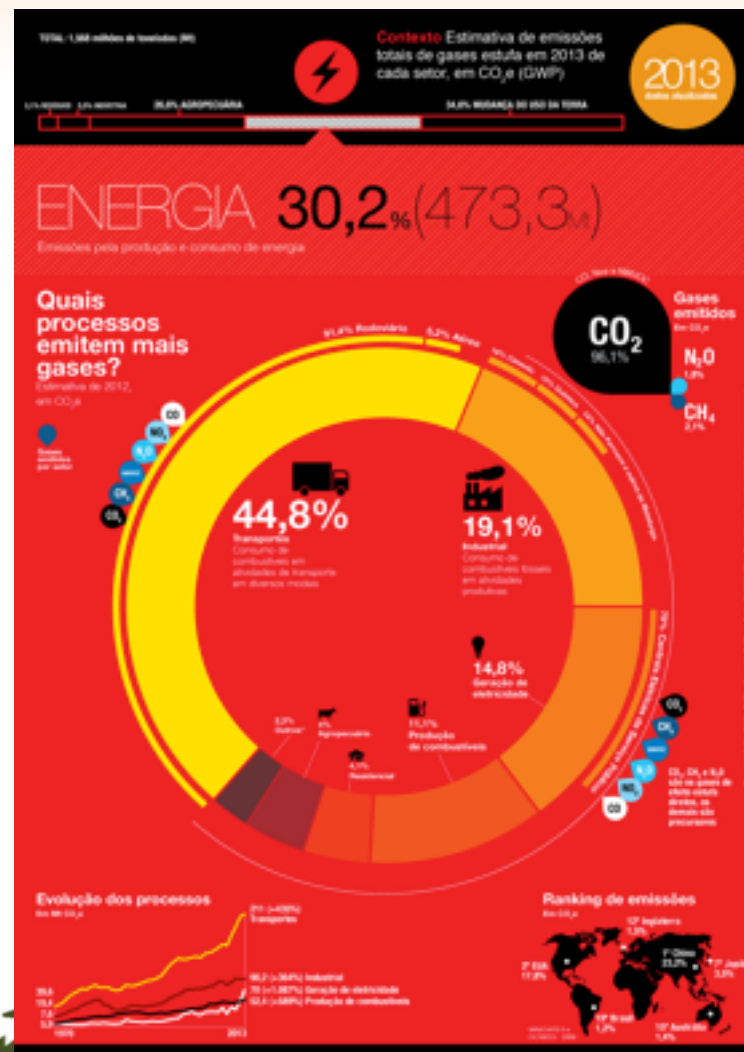
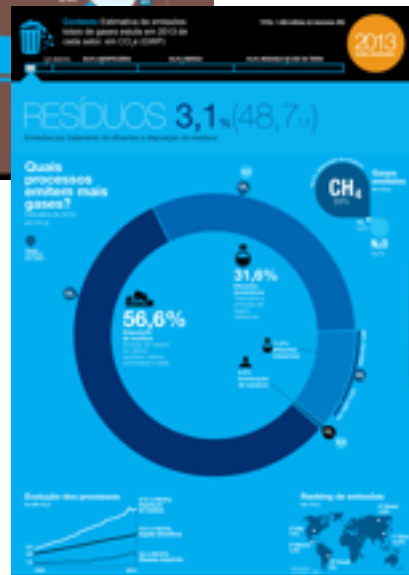
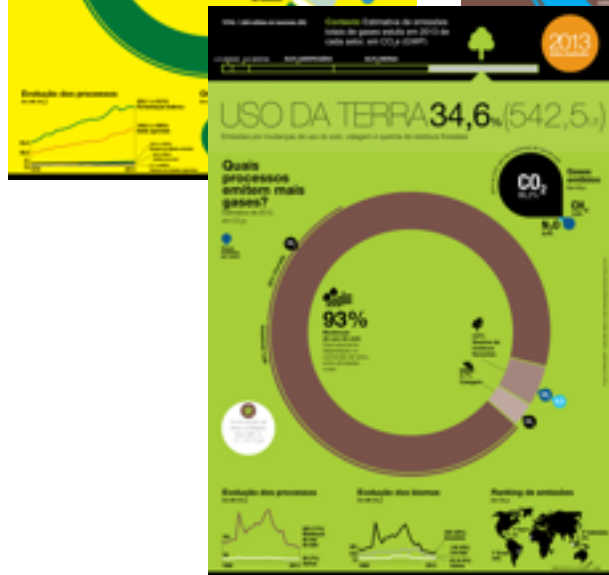
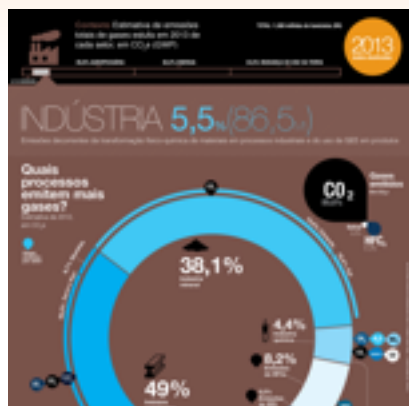
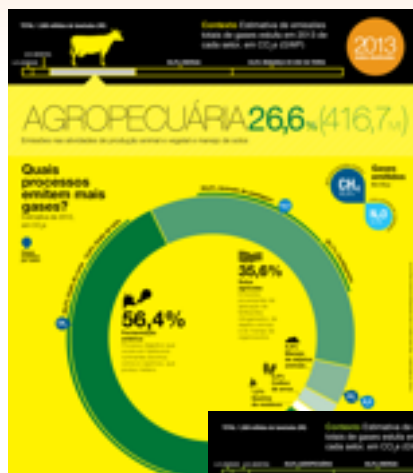
Sub-setor	2006	2007	2008	2009	2010	2011
Cultivo do Arroz	8.551.877	8.030.562	8.352.332	9.072.265	8.710.190	9.555.142
Fermentação Entérica	240.176.405	235.582.325	236.495.824	240.000.015	244.844.076	245.555.555
Manejo de Dejetos Animais	19.243.536	19.452.896	20.391.875	21.408.814	22.271.330	22.575.032
Queima de Resíduos Agrícolas	8.191.999	9.021.817	9.399.895	4.981.044	4.891.271	4.175.545
Solos Agrícolas	142.715.043	145.553.252	145.154.752	146.025.137	154.066.590	151.010.957

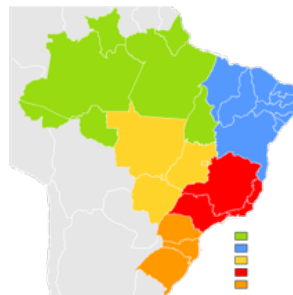
Referências Metodológicas

Estas estimativas tiveram como ponto de partida a metodologia de dois documentos principais: o Guia do IPCC 2006 para Inventário de GEE e o 2º Inventário Brasileiro de Emissões e Remoções Antrópicas de GEE (2009).

Sem o 2º inventário de emissões e respectivos relatórios de referência não seria possível executar este estudo, pois a grande maioria dos dados específicos foram calculados no processo de elaboração do Inventário por equipes de dezenas de instituições e envolveu pesquisadores e especialistas.

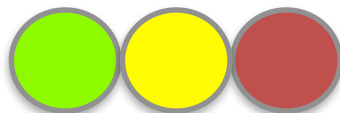
Elaboração das estimativas passo a passo





1999
2000
2001
2002
2003

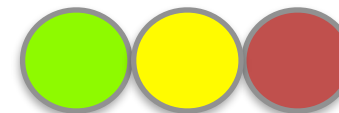
General
Data Quality



Distribution
by State



Historical
series



General
Data Quality

Distribution
by State

Historical
series

ASPECTS	QUALIFICATION
TIER	1 IPCC Tier 1 - default/global emissions factors
	2 IPCC Tier 2- national or regional emissions factors
	3 IPCC Tier 3 - specific emissions factor
EXISTENCE OF ACTIVITY DATA	1 data is available in accordance with national inventory sources. Include data from associations and private institutions even if not available.
	2 incomplete data
	3 non existence data
AVAIABILITY OF ACTIVITY DATA	1 data is available free and public
	2 data is available with some restrictions (ex. only on specific location or need a special request)
	3 data not available
TYPE OF EMISSION FACTOR	1 possible to use the emissions factor of the national inventory
	2 implicit/secondary emissions factor with correlation (r^2) = or > 0,7
	3 implicit/secondary emissions factor with correlation (r^2) < 0,7
NEED FOR IMPROVEMENT	1 no need to improve (vis a vis national inventory)
	2 need to improve method or data
	3 need to improve method and data
GENERAL QUALITY OF DATA	1 data would have similar level of confidence of the national inventory
	2 good data for a estimation; may present minor differences for the national inventory
	3 data too uncertain; difficult to define if it's accuracy



General
Data Quality

Distribution
by State

Historical
series

Aspecto	Valores
POSSIBILITY OF DISTRIBUTION	1 Alocação possível de toda emissão nacional nos estados (não fica resíduo/montante não alocado)
	2 Alocação parcialmente possível. Parte das emissões nacionais não foi alocada.
	3 Alocação para os estados não foi possível
DISTRIBUTION CRITERIA	1 Critério de alocação esta diretamente relacionado com os fatores de emissão
	2 Critério de alocação usa fatores indiretos com alta correlação com os fatores diretos.
	3 Critério de alocação usa fatores indiretos com baixa correlação com fatores diretos.
DATA EXISTENCE FOR STATE DISTRIBUTION	dados existentes para calculo de acordo com Tier do 2o inventário (inclui dados existentes em associações de classe, mesmo que não seja publico). Dados que só existem nas empresas ou agentes economicos específicos não serão considerados.
	2 dados incompletos
	3 dados não existentes
AVAILABILITY OF DATA	1 dados disponíveis de forma pública e gratuita
	2 dados disponíveis com alguma restrição (pago; em local físico específico, ou disponível apenas mediante solicitação específica)
	3 dados não disponíveis
GENERAL QUALITY OF THE DISTRIBUTION	1 dado confiável; capaz de reproduzir 2o inventario
	2 dado confiável para estimativa; inventário pode gerar diferenças significativas
	3 dado pouco confiável ou de difícil avaliação



General
Data Quality

Distribution
by State

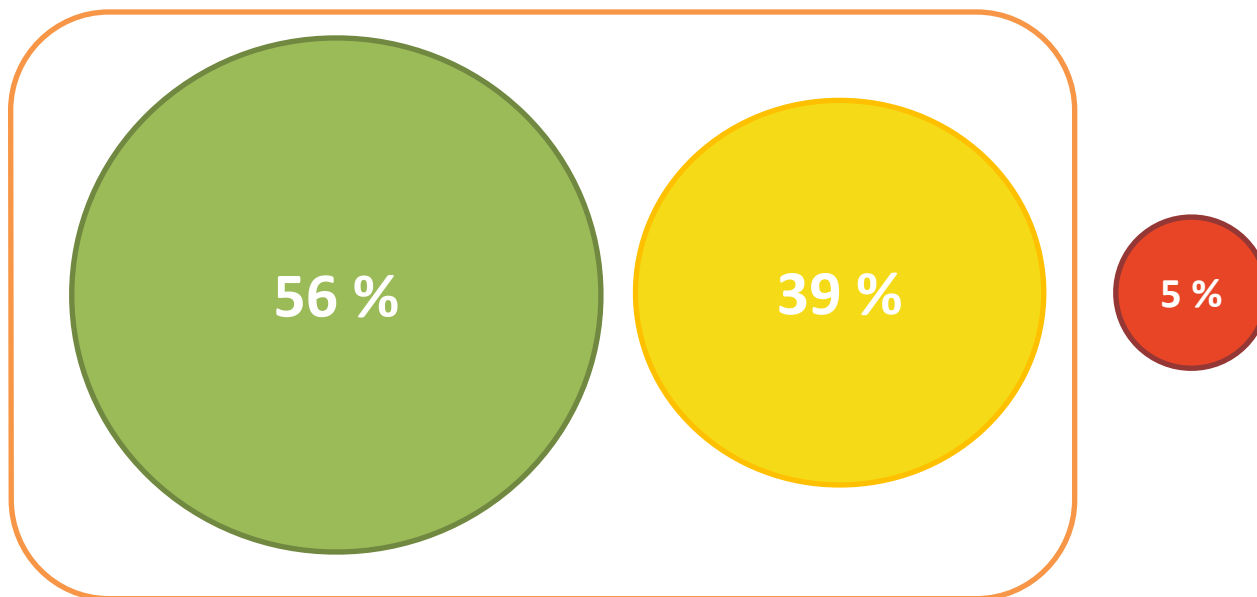
Historical
series

ASPECTS	QUALIFICATION
RELATIVITY QUALITY OF THE HISTORICAL DATA	1 Activity data available for the year and emission factor adequate
	2 Activity data estimated OR emissions factor not adequate (or difficult to evaluate)
	3 Activity data estimated and emissions factor not adequated (or difficult to evaluate)



	Tier		Nível de Atividade		Fator de Emissão	Necessidade de Aprimoramento	Qualidade Geral do Dado	% do total das Emissões	Emissões (ton GWP)	Proporção com Boa Qualidade (1)	Proporção com Boa Qualidade (1 e 2)
	2º inventário	SEEG	Existência do Dado	Disponibilidade do Dado							
ENERGIA								29%	436.743.372	28,4%	28,5%
Fugitivas								1,0%	15.094.665		
Carvão Mineral	1	1	1	2	2	2	2	0,09%	1.336.784	0,00%	0,09%
Petróleo e Gás	2	n.a.	1	3	2	3	3	0,93%	13.757.881	0,00%	0,00%
Queima de Combustíveis								28,4%	421.648.707		
Agropecuário	2	2	1	1	1	1	1	1,21%	17.930.465	1,21%	1,21%
Comercial	2	2	1	1	1	1	1	0,16%	2.374.760	0,16%	0,16%
Carvoarias	2	2	1	1	1	1	1	0,12%	1.733.935	0,12%	0,12%
Consumo Final Não Energético	2	2	1	1	1	1	1	0,59%	8.766.093	0,59%	0,59%
Geração de Eletricidade								3,27%	48.495.791		
Centrais Elétricas Autoprodução	2	2	1	1	1	1	1	0,95%	14.095.754	0,95%	0,95%
Centrais Elétricas de Serviço Público	2	2	1	1	1	1	1	2,32%	34.400.036	2,32%	2,32%
Industrial								6,15%	91.237.312		
Alimentos e Bebidas	2	2	1	1	1	1	1	0,39%	5.736.154	0,39%	0,39%
Cerâmica	2	2	1	1	1	1	1	0,37%	5.425.125	0,37%	0,37%
Cimento	2	2	1	1	1	1	1	1,14%	16.966.831	1,14%	1,14%
Ferro Gusa e Aço	2	2	1	1	1	1	1	0,90%	13.362.157	0,90%	0,90%
Ferro Ligas	2	2	1	1	1	1	1	0,09%	1.393.326	0,09%	0,09%
Mineração e Pelotização	2	2	1	1	1	1	1	0,49%	7.277.576	0,49%	0,49%
Não Ferrosos e Outros da Metalurgia	2	2	1	1	1	1	1	0,86%	12.719.463	0,86%	0,86%
Outras Indústrias	2	2	1	1	1	1	1	0,58%	8.667.596	0,58%	0,58%
Papel e Celulose	2	2	1	1	1	1	1	0,27%	3.956.547	0,27%	0,27%
Química	2	2	1	1	1	1	1	0,99%	14.736.963	0,99%	0,99%
Têxtil	2	2	1	1	1	1	1	0,07%	995.574	0,07%	0,07%
Público	2	2	1	1	1	1	1	0,06%	824.577	0,06%	0,06%
Residencial	2	2	1	1	1	1	1	1,28%	19.052.454	1,28%	1,28%





95% Trustfull for a estimation



SEEG x MCT

CO2e (t GWP)	MCT		SEEG II		Var (SEEG II)	
	2011	2012	2011	2012	2011	2012
Uso da Terra	627.726	492.925	591.702	503.373	-5,7%	2,1%
Agropecuária	449.853	446.445	417.641	412.785	-7,2%	-7,5%
Energia	407.554	446.154	406.802	441.085	-0,2%	-1,1%
Processos Industriais	86.173	85.365	84.983	86.221	-1,4%	1,0%
Resíduos	48.139	49.775	48.137	47.587	0,0%	-4,4%
Total Geral	1.619.445	1.520.664	1.549.265	1.491.051	-4,3%	-1,9%



Emissions GEE (tCO₂e)

2013 GEE Emissions increase

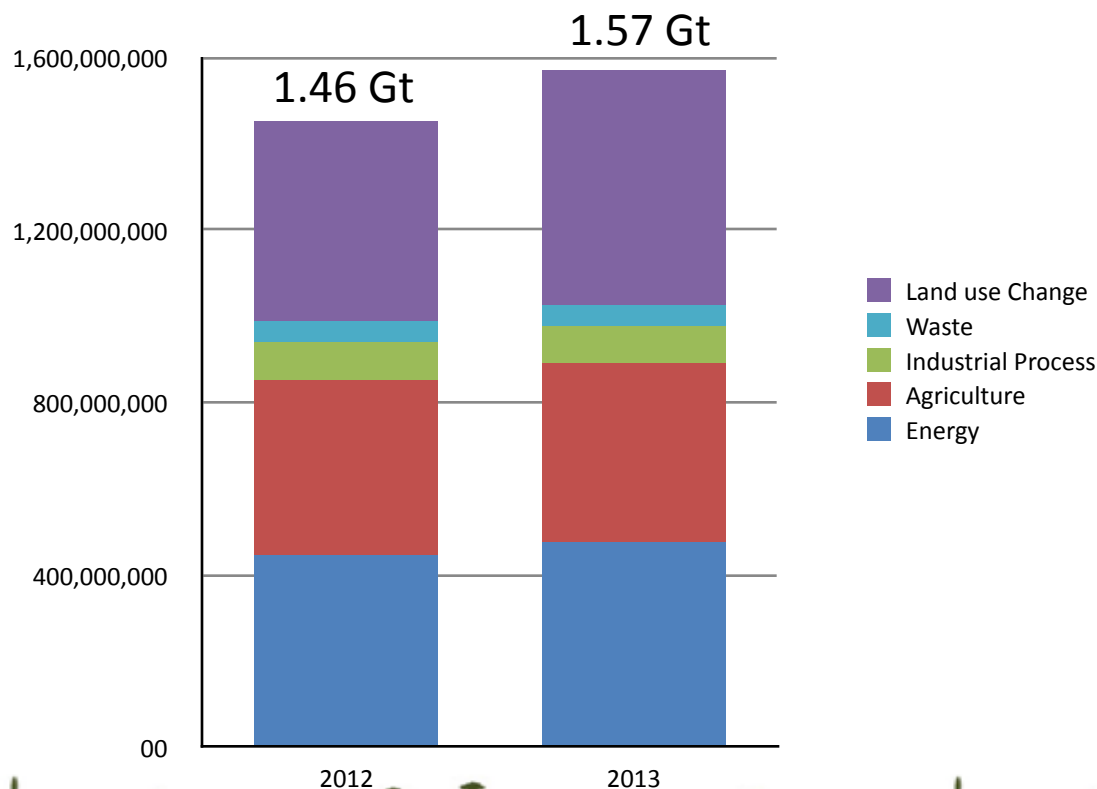
7,8%

All sector increased.

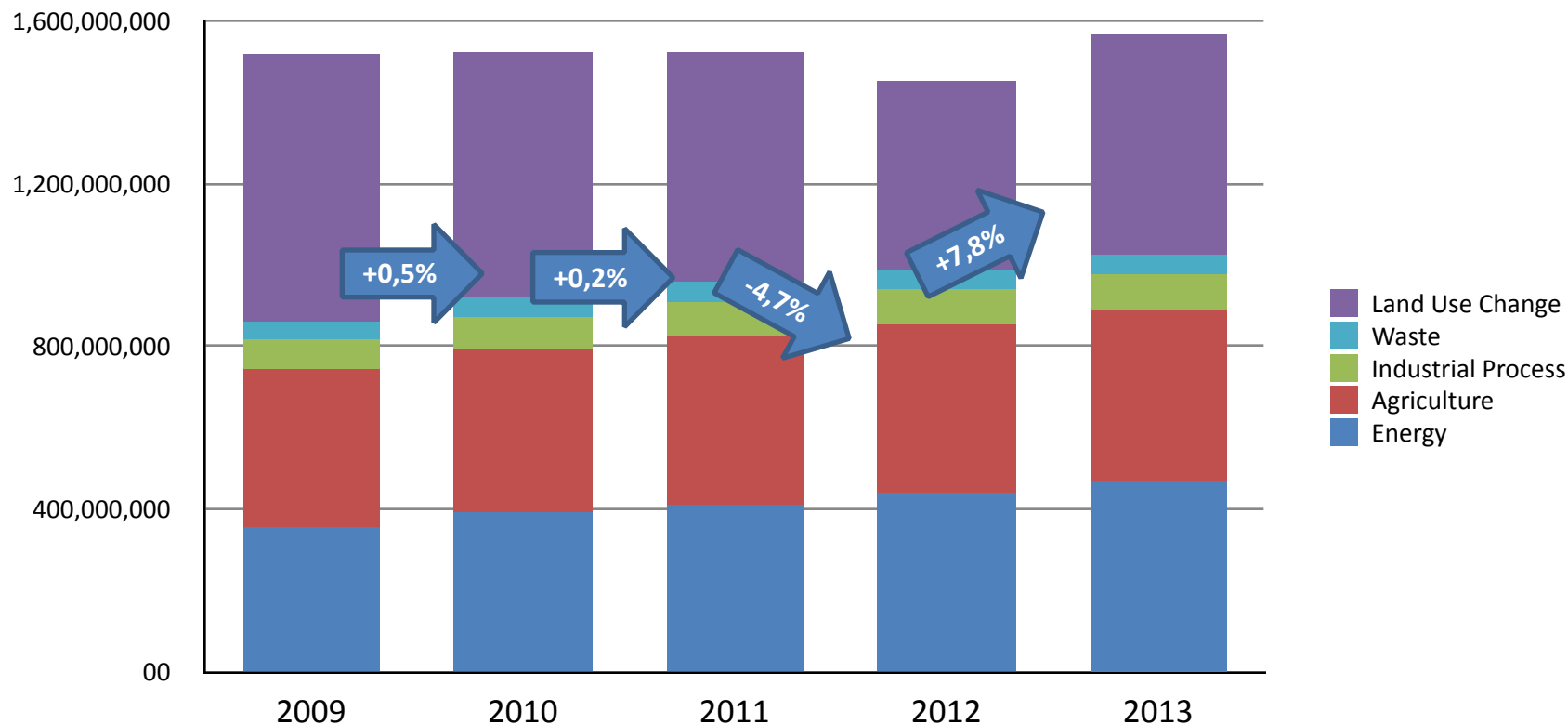
Critical:

Energy +7,3%

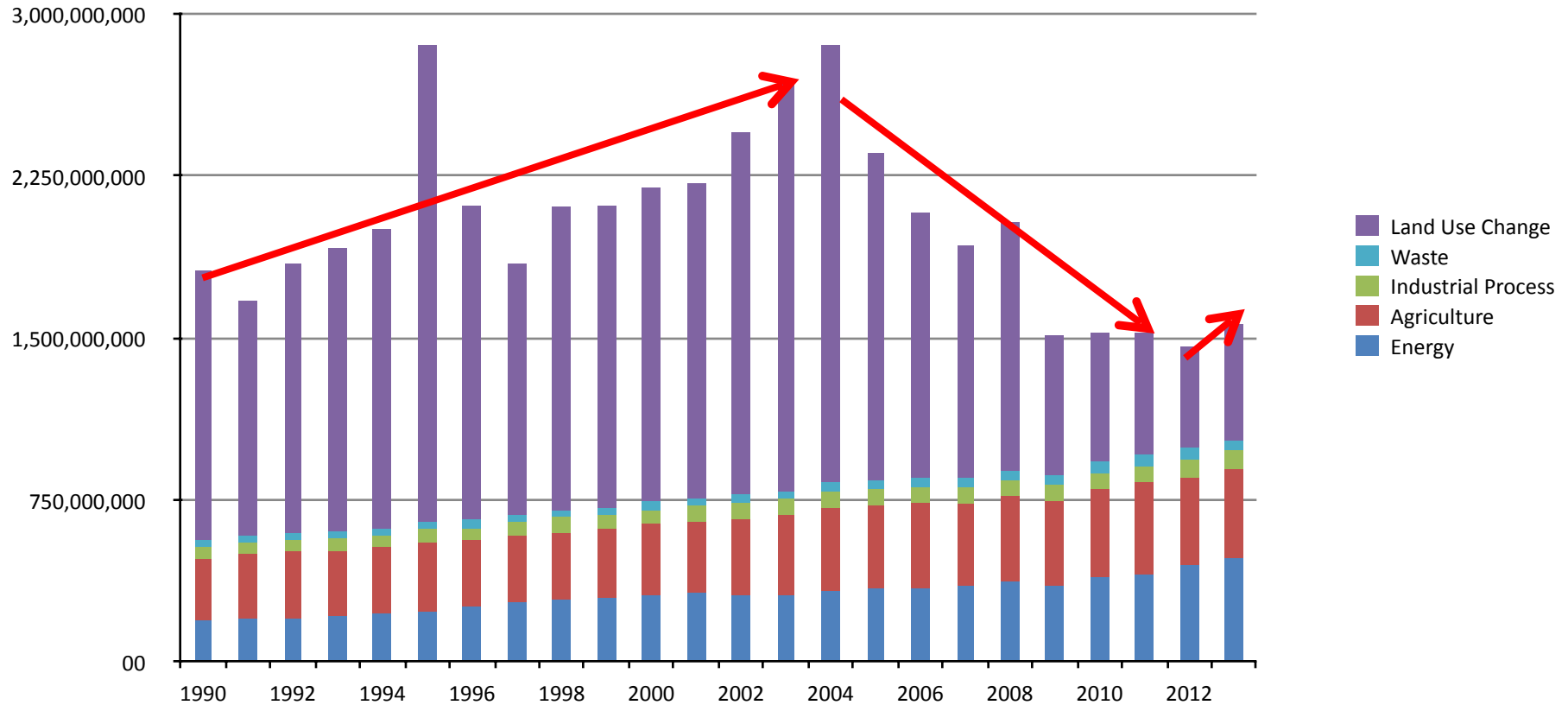
LULUCF +16,4%



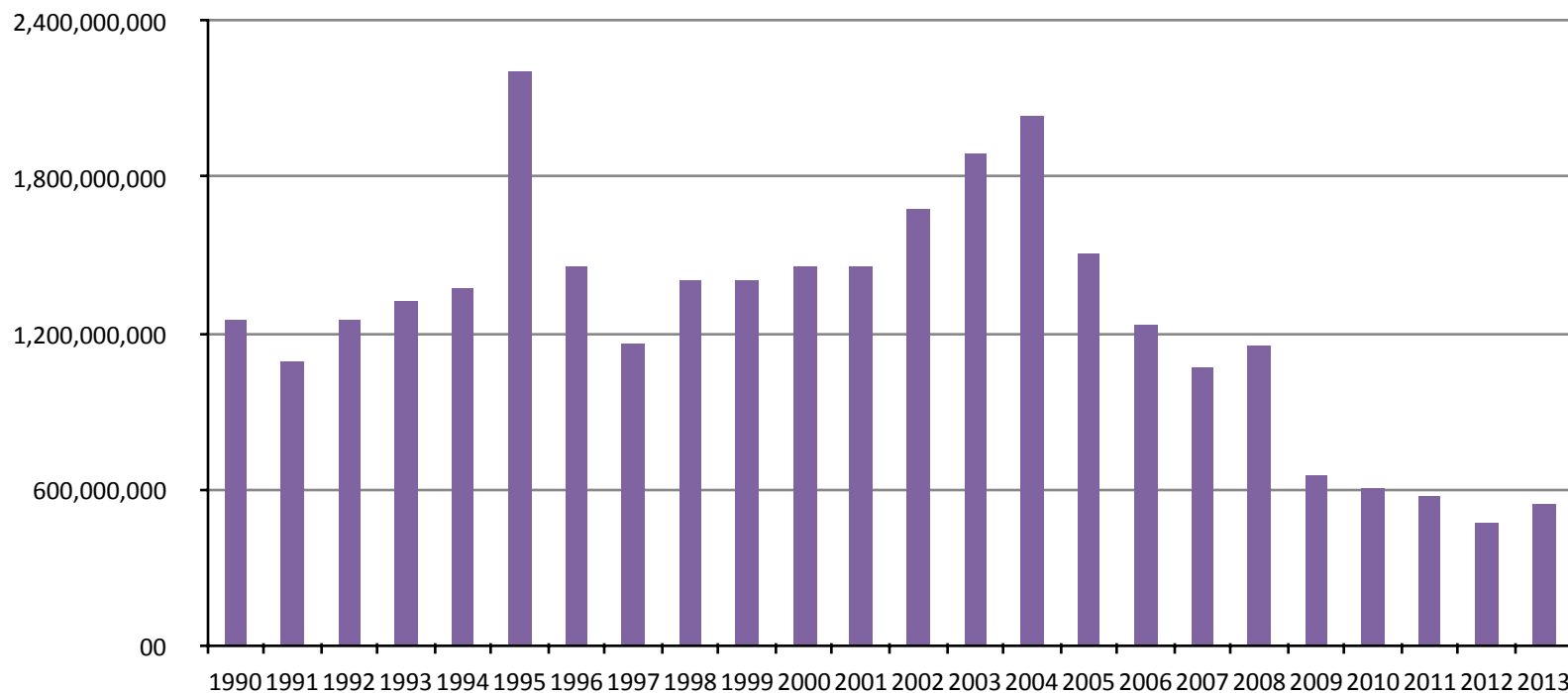
GEE Emissions in Brazil - 1990-2013 (tCO₂e)



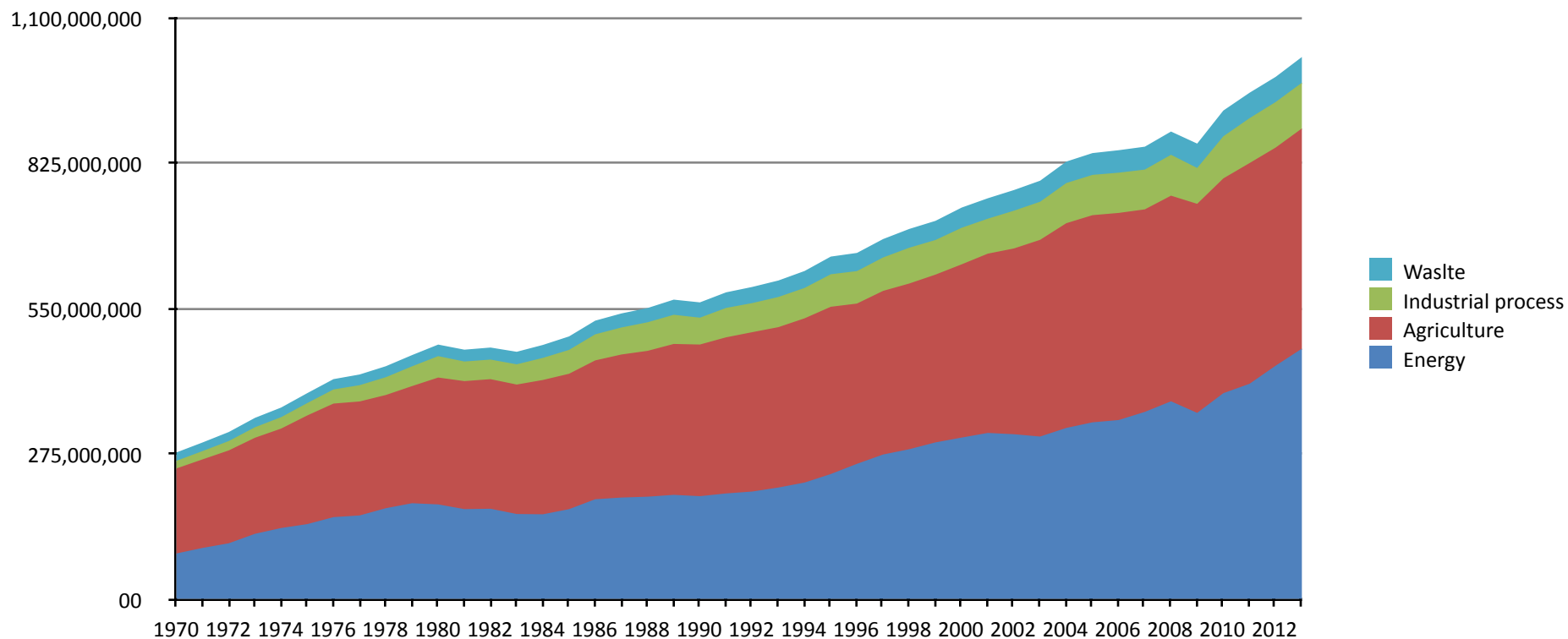
GHG Emission de GEE by Sector in Brazil 1990 to 2013 (CO₂e)



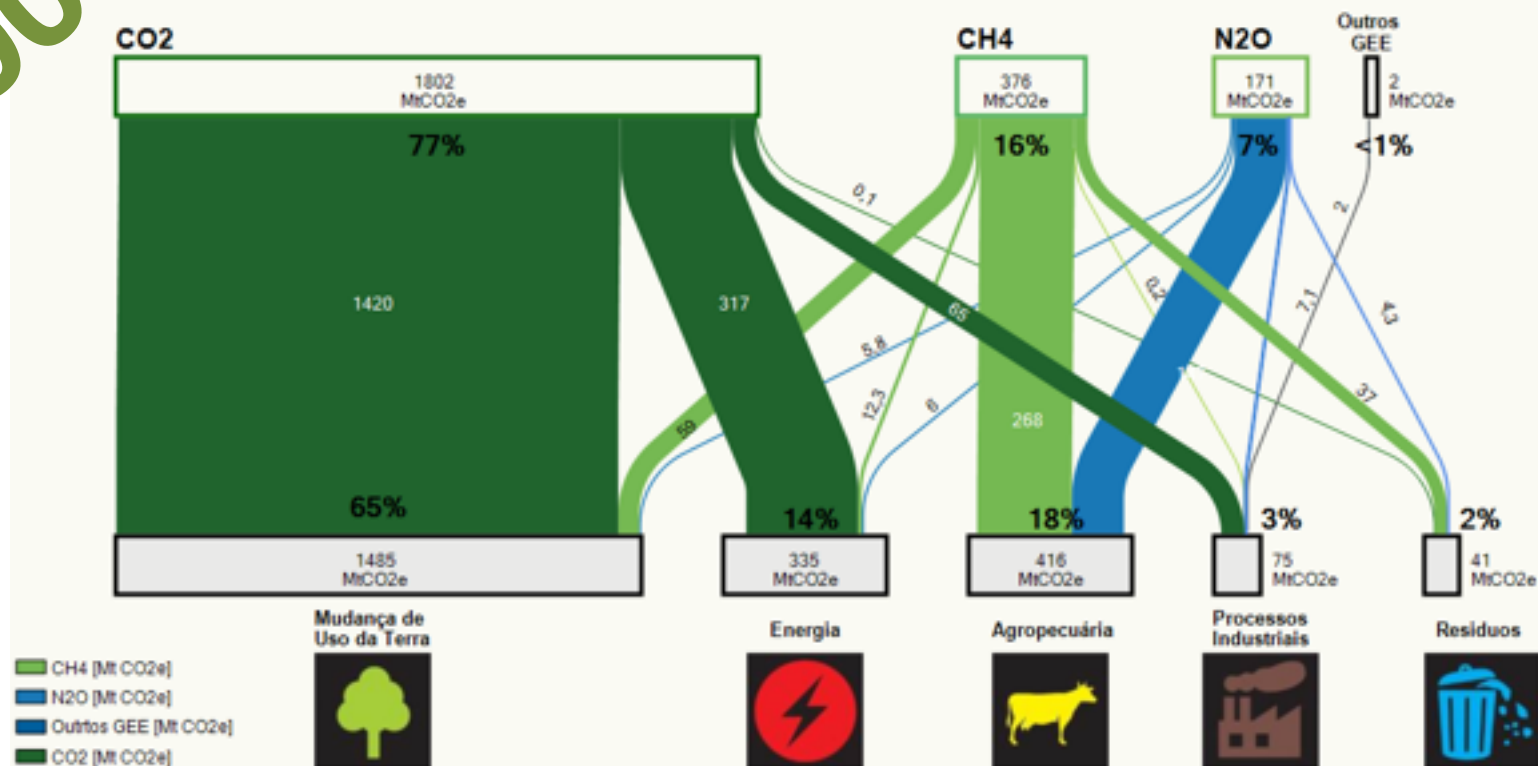
GHG Emissions LULUCF – 1970 to 2013 (t CO₂e)



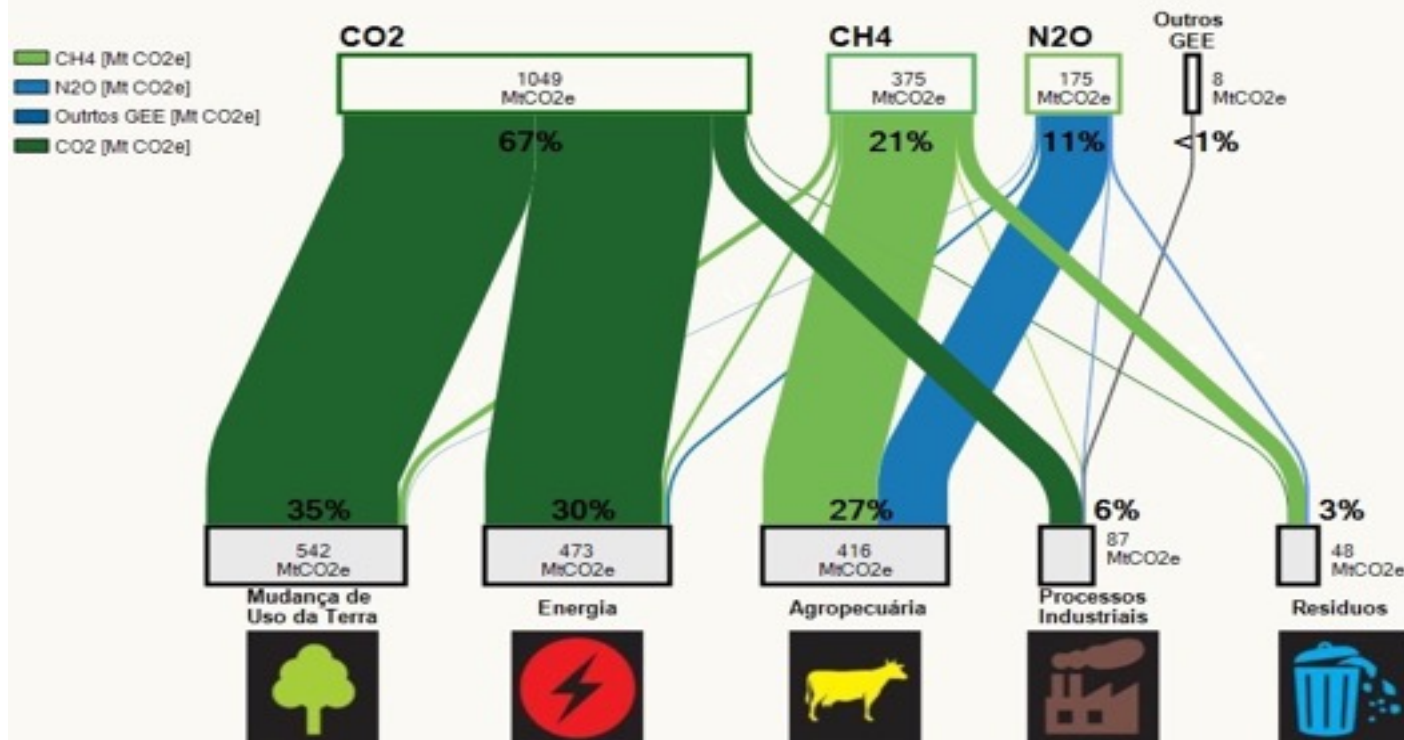
GHG Emissions by Sector in Brasil (not inc. LULUCF) – 1970 to 2013 (t CO₂e)



2005

Emissões de GEE por setor e gás em 2015 (tCO₂e)

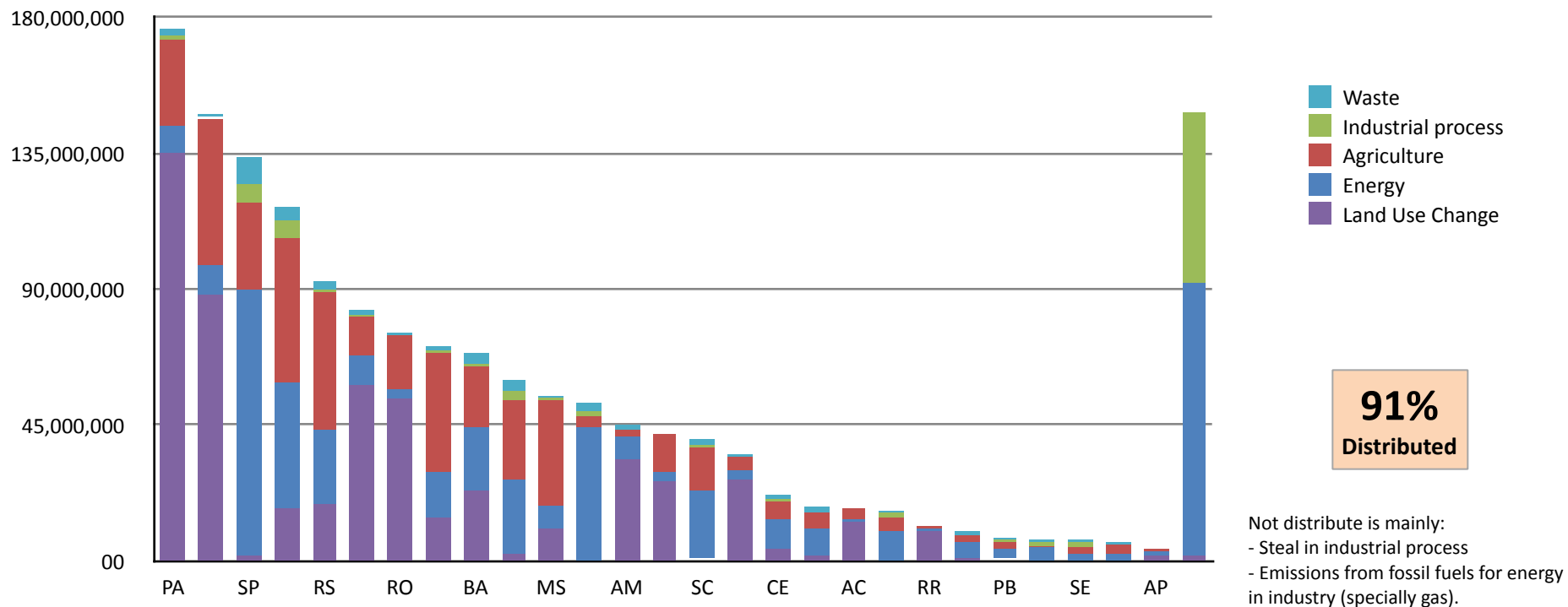
2013

Emissões de GEE no Brasil por setor e gás em 2012 (MtCO₂e)

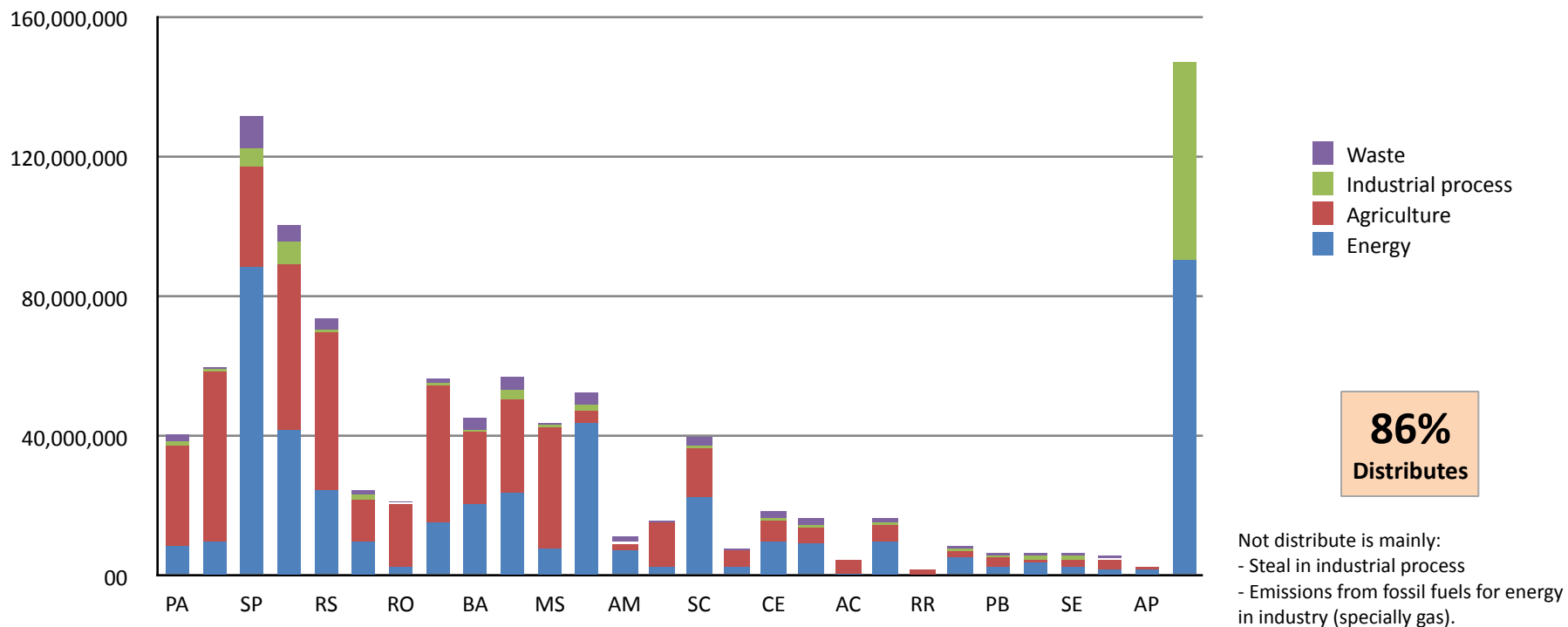
GHG Net Emissions in Brazil – 2000 – 2013 (t CO₂e)



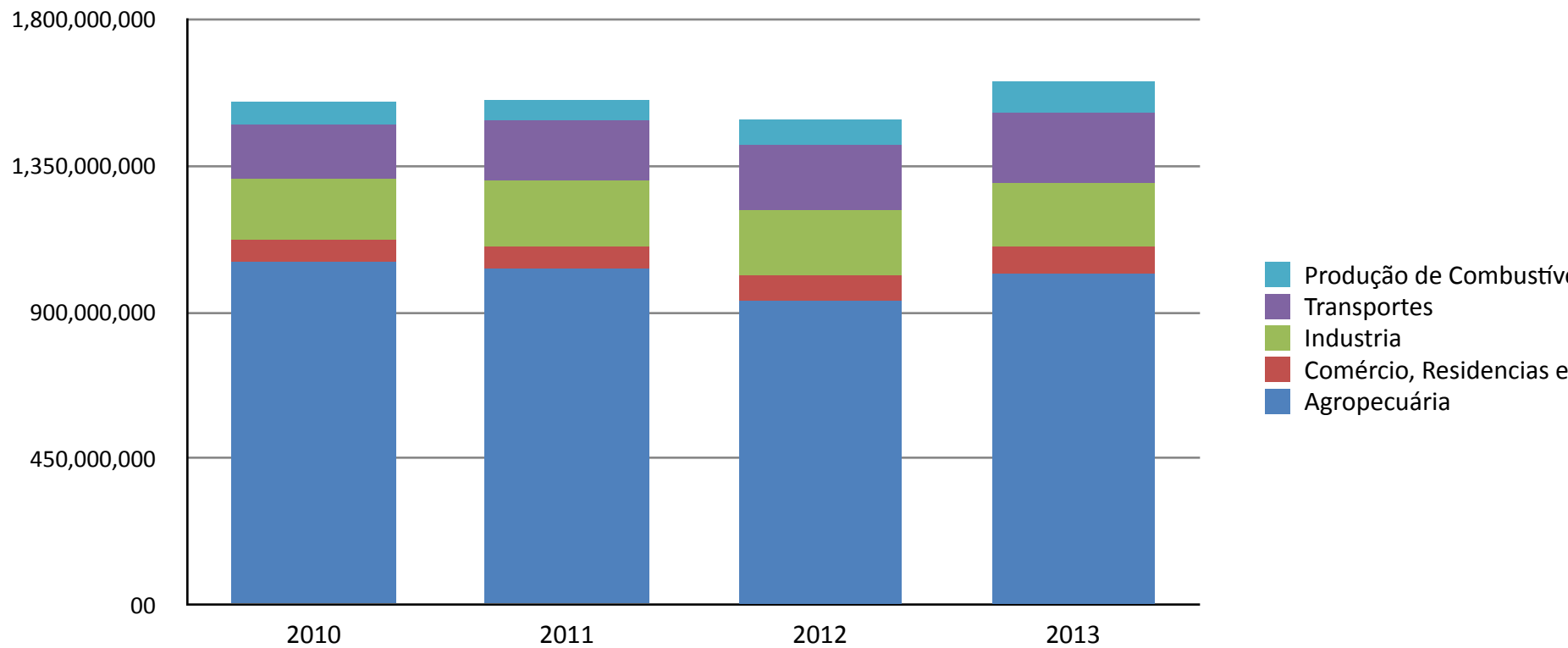
GHG Emissions by State in 2013 (tCO₂e)



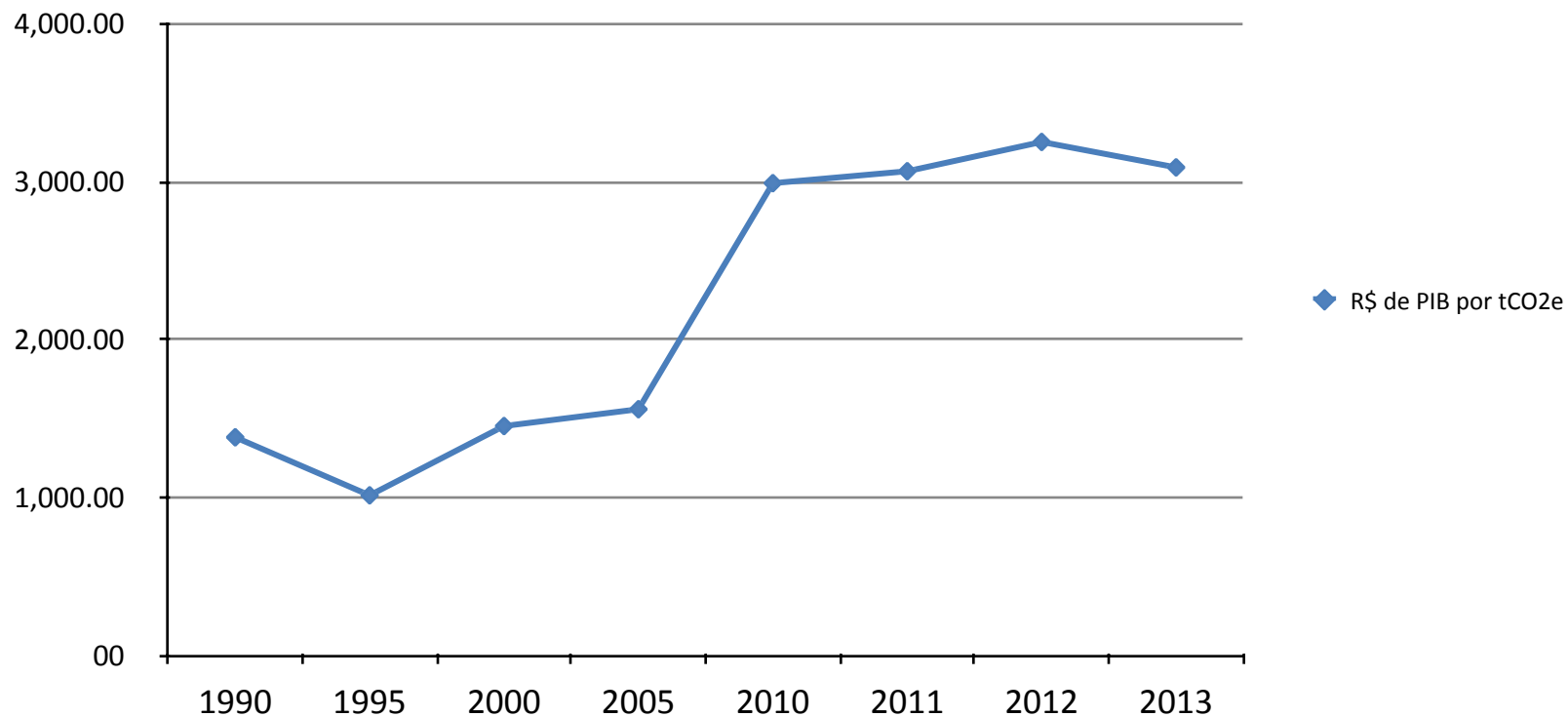
GHG Emissions Estimation (CO₂e) for 2013 distribute by state (not including LUCF)



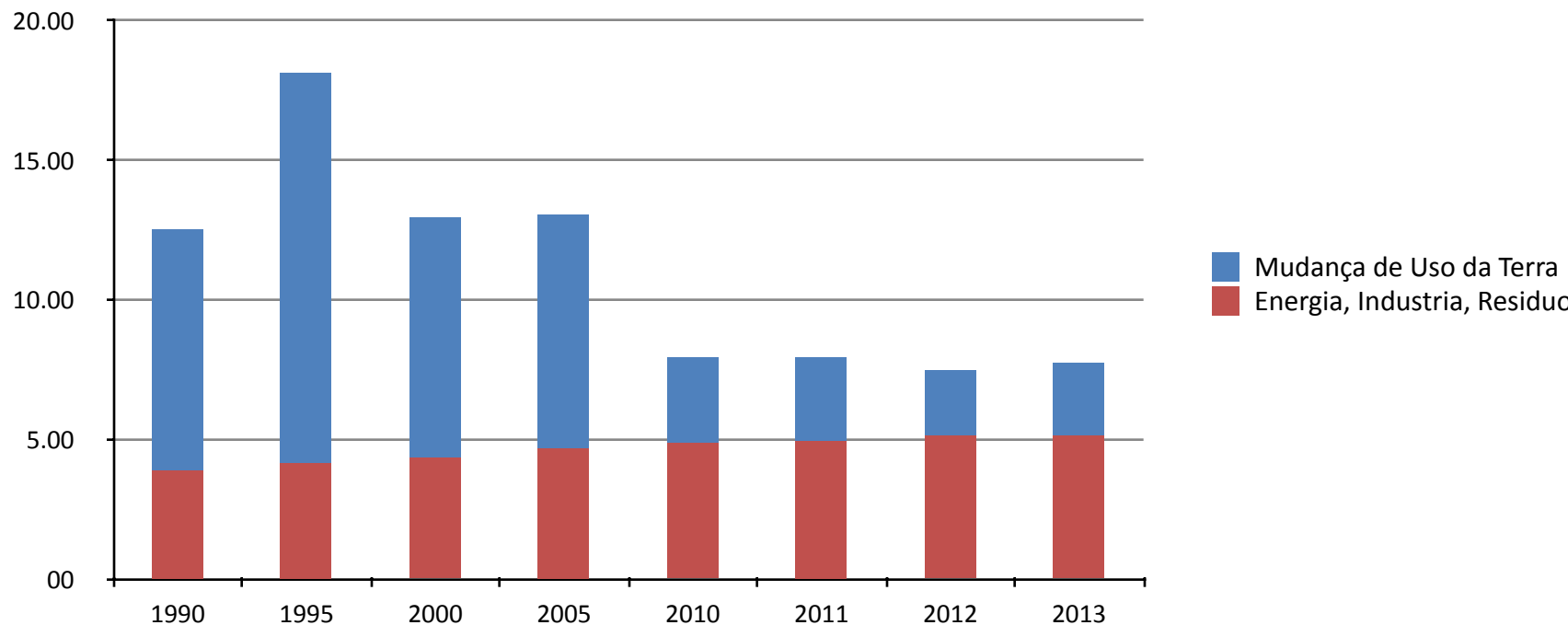
GHG Emissions estimations by economic sector in 2013 (tCO₂e)



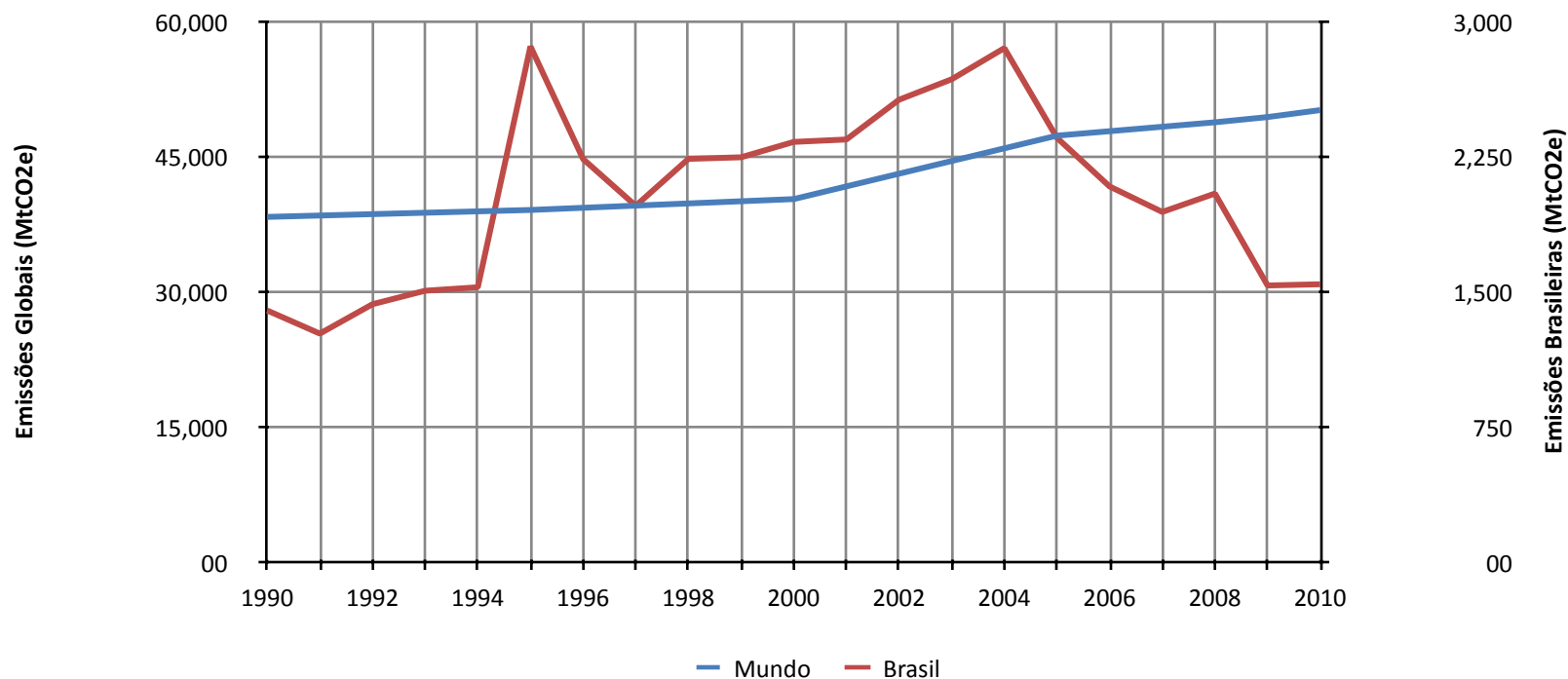
Intensity - GDP by tCO₂e emissions



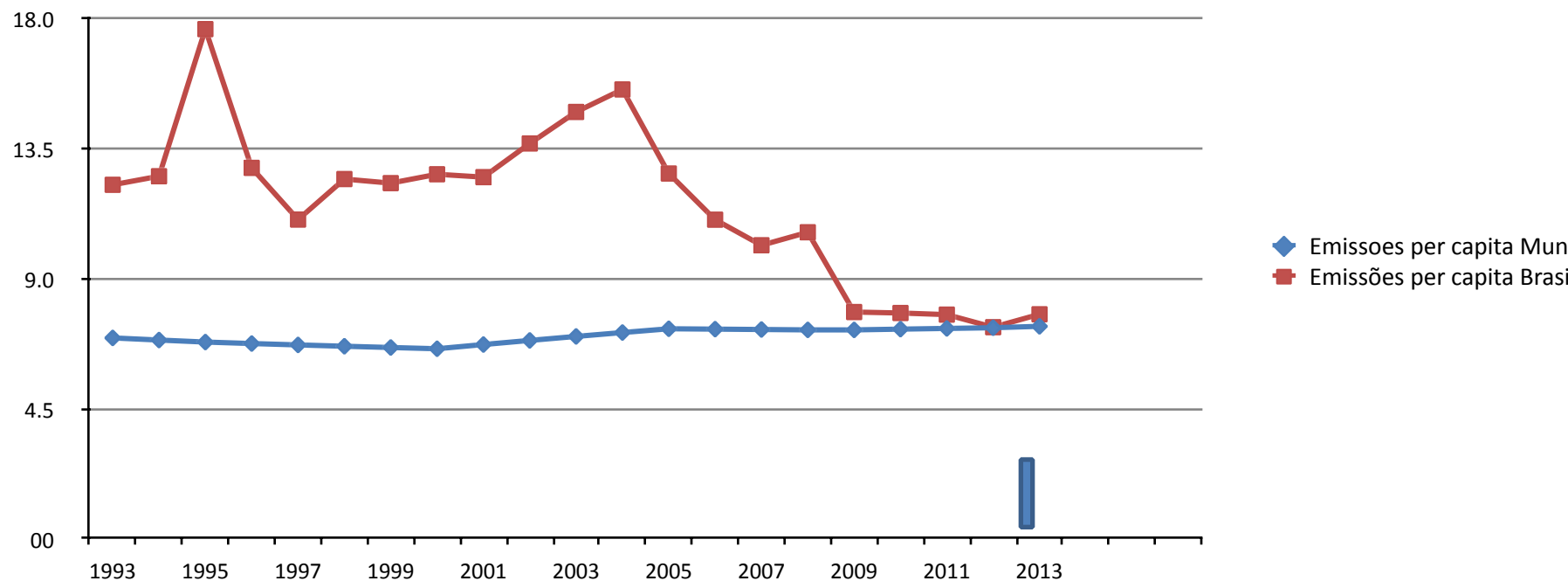
Per Capita Emissions of GHG in Brazil 1990 - 2013 (t CO₂e)



GHG Emissions in Brazil and World - 1990 to 2013 (CO₂e)

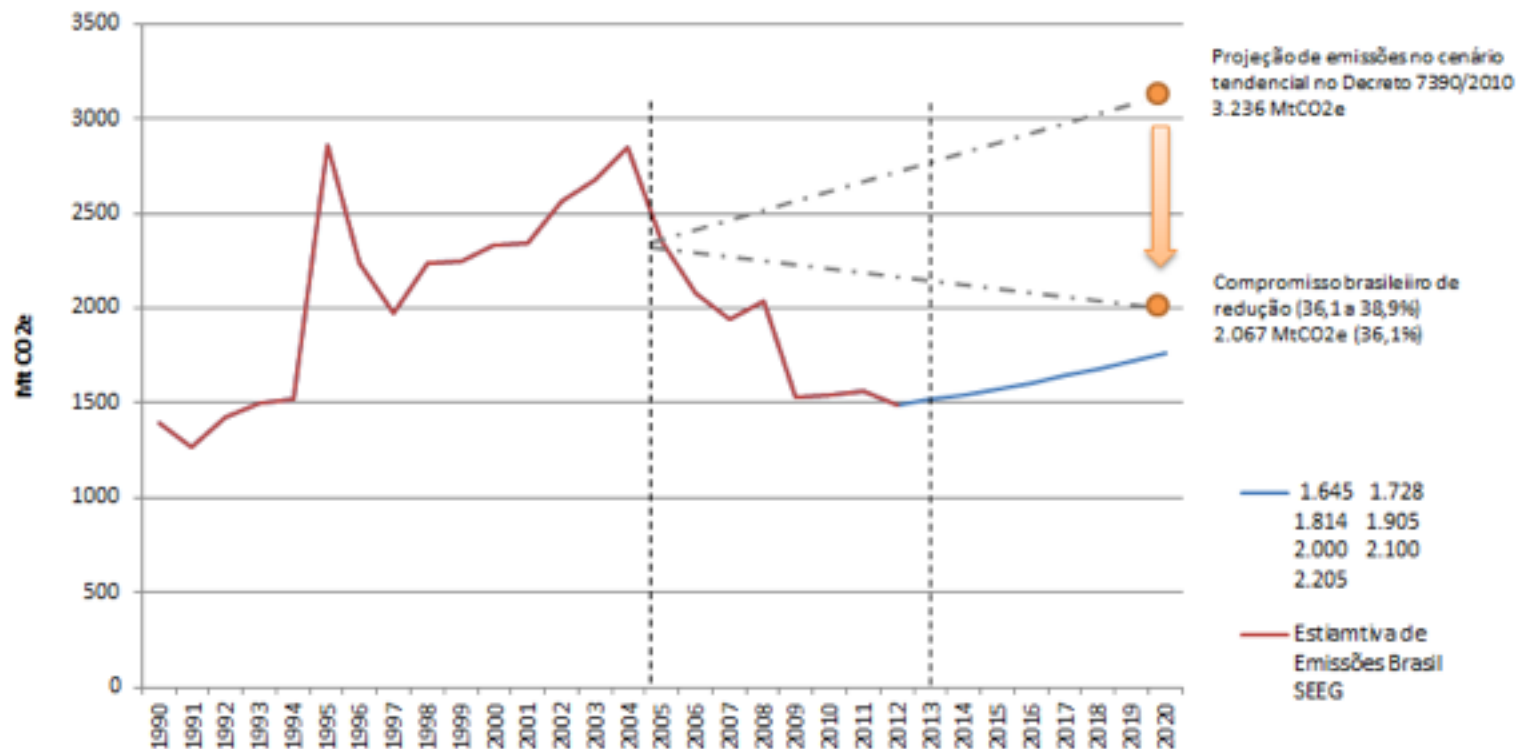


Per Capita Emissions in Brazil – 1993 to 2013 (t CO₂/per capita)



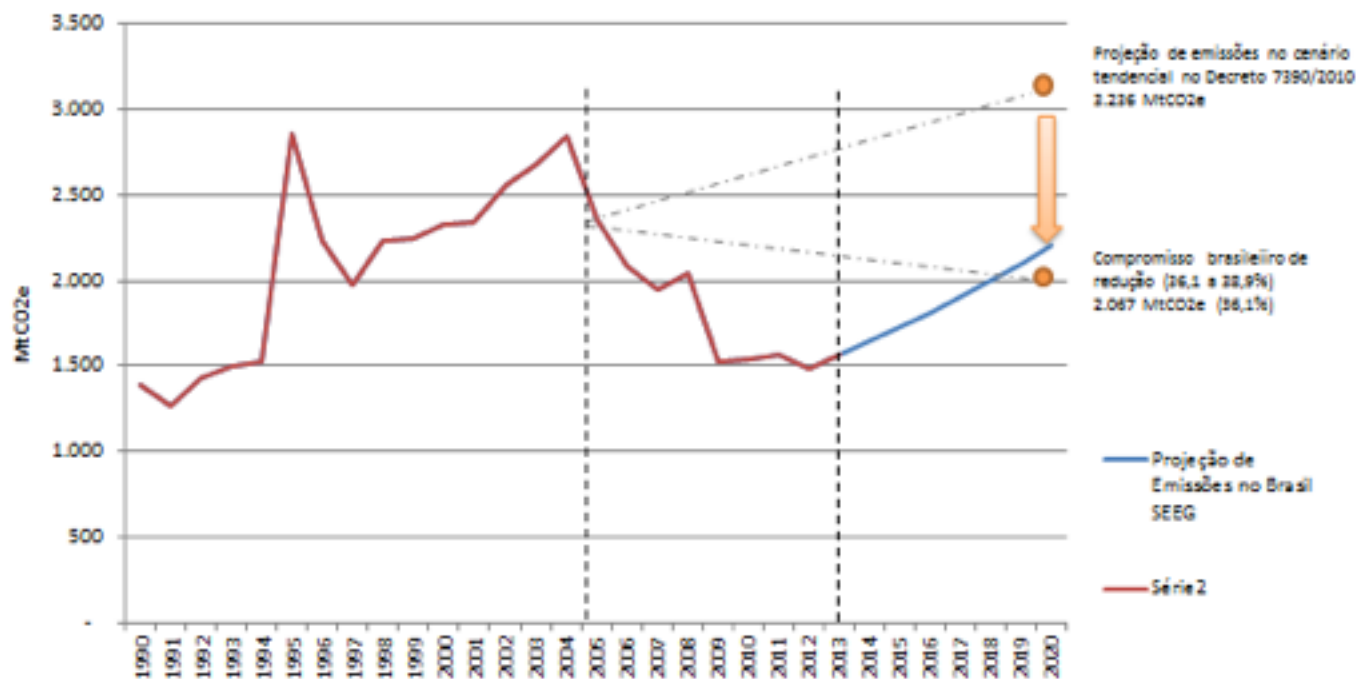
Emissions Projections x Brazilian target reduce emissions (t CO₂e)

Base SEEG I



Emissions Projections x Target to Reduce Emissions (t CO₂e)

Base SEEG I

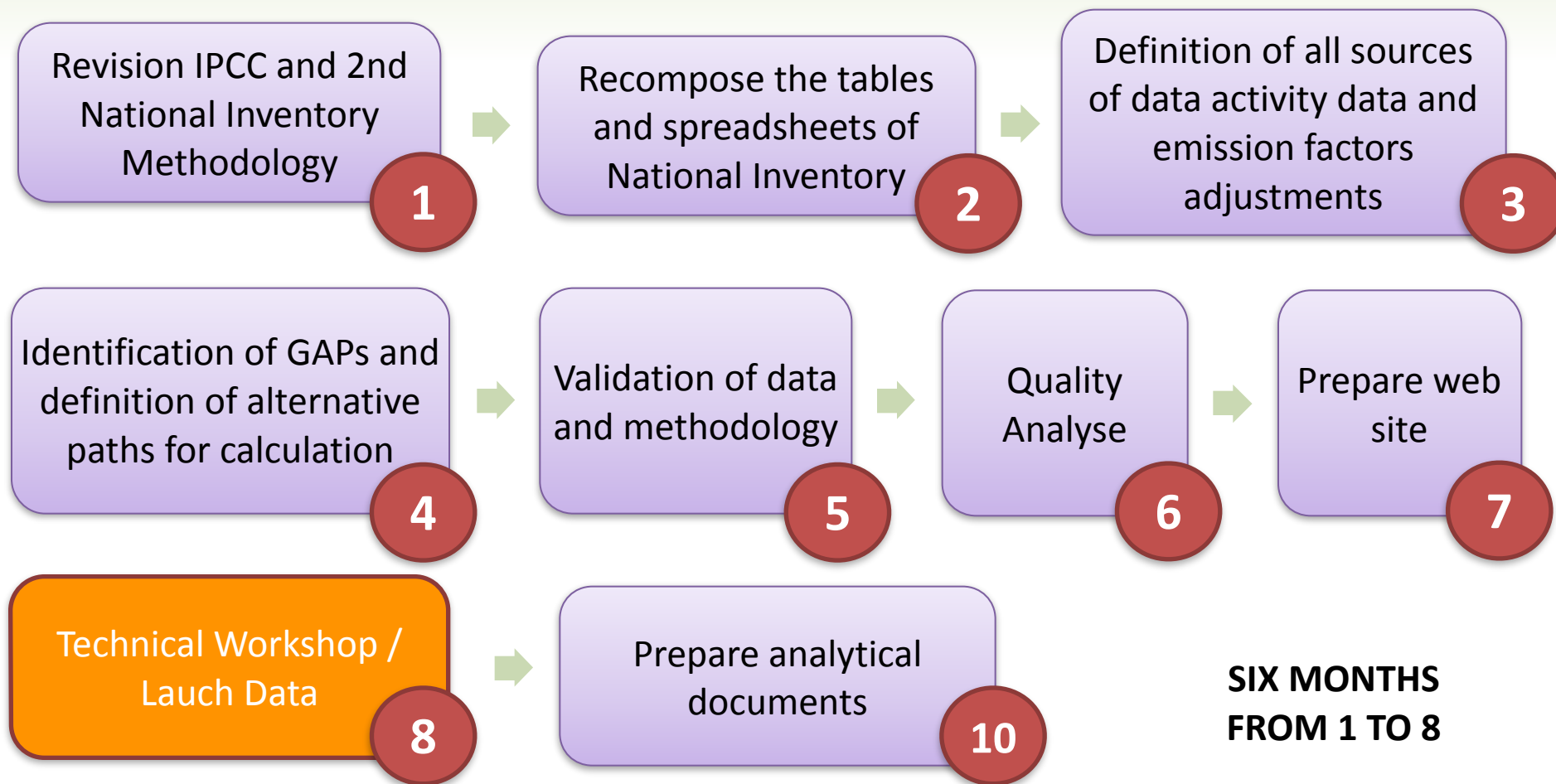




All data available at:

seeg.eco.br





Products

- Methodological Note
- Calculation spreadsheets
- Table of Quality Assessment
- Table of Emissions Data (unique)
- Analytical Report
- Presentation of Emissions by Sector
- Texts for the Website



Revision IPCC and 2nd National Inventory Methodology

1

tree of sources of emissions to be considered
 emission factor and methods for calculation
 special adaptations of the IPCC methodology for the country



