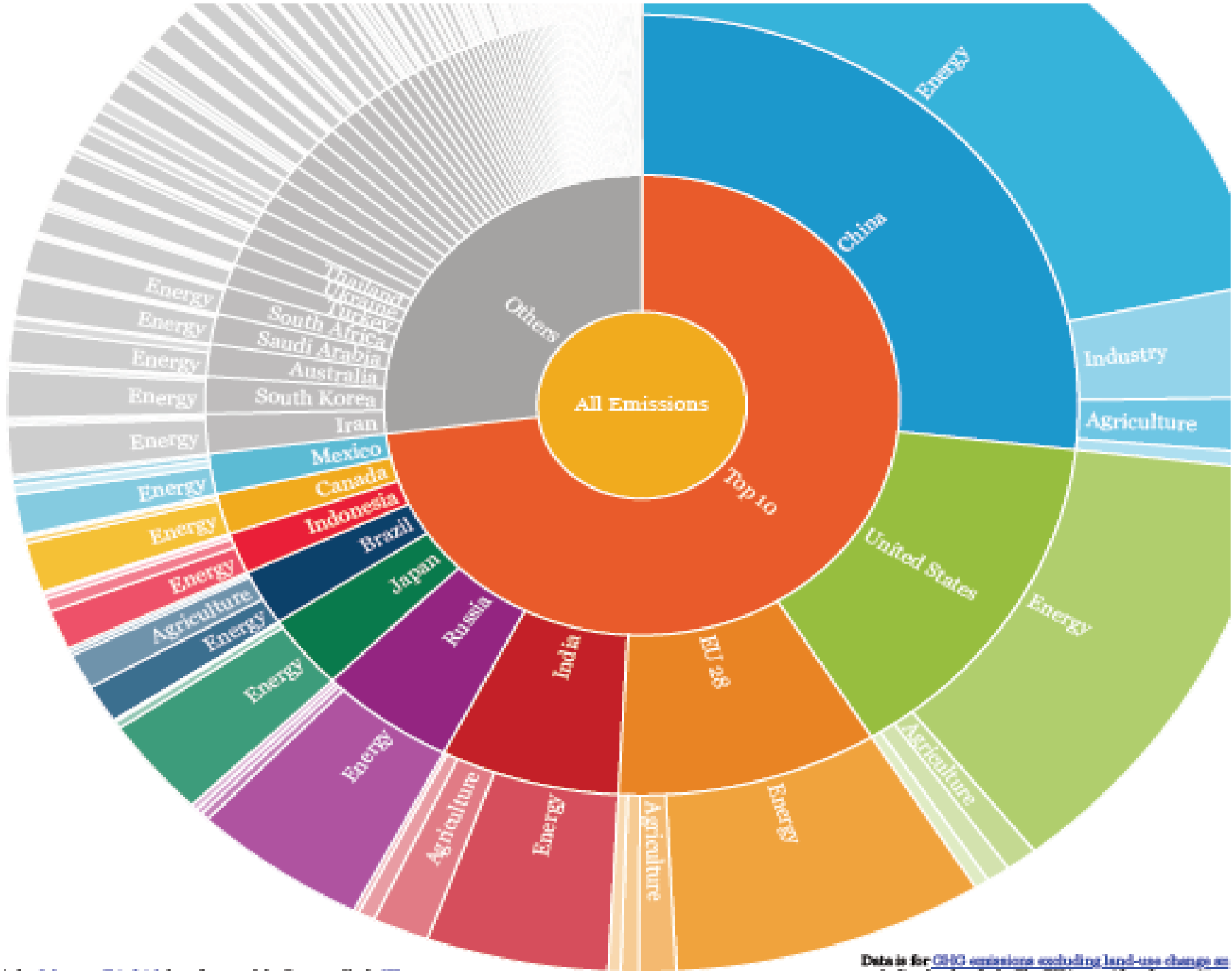


# Methane emission and performance of steers in pasture and integrated crop-livestock-forest systems

Alexandre Berndt, Paulo Meo,  
Amanda Lemos, Leandro Sakamoto,  
Andre Pedroso, Jose Pezzopane,  
Patricia Oliveira

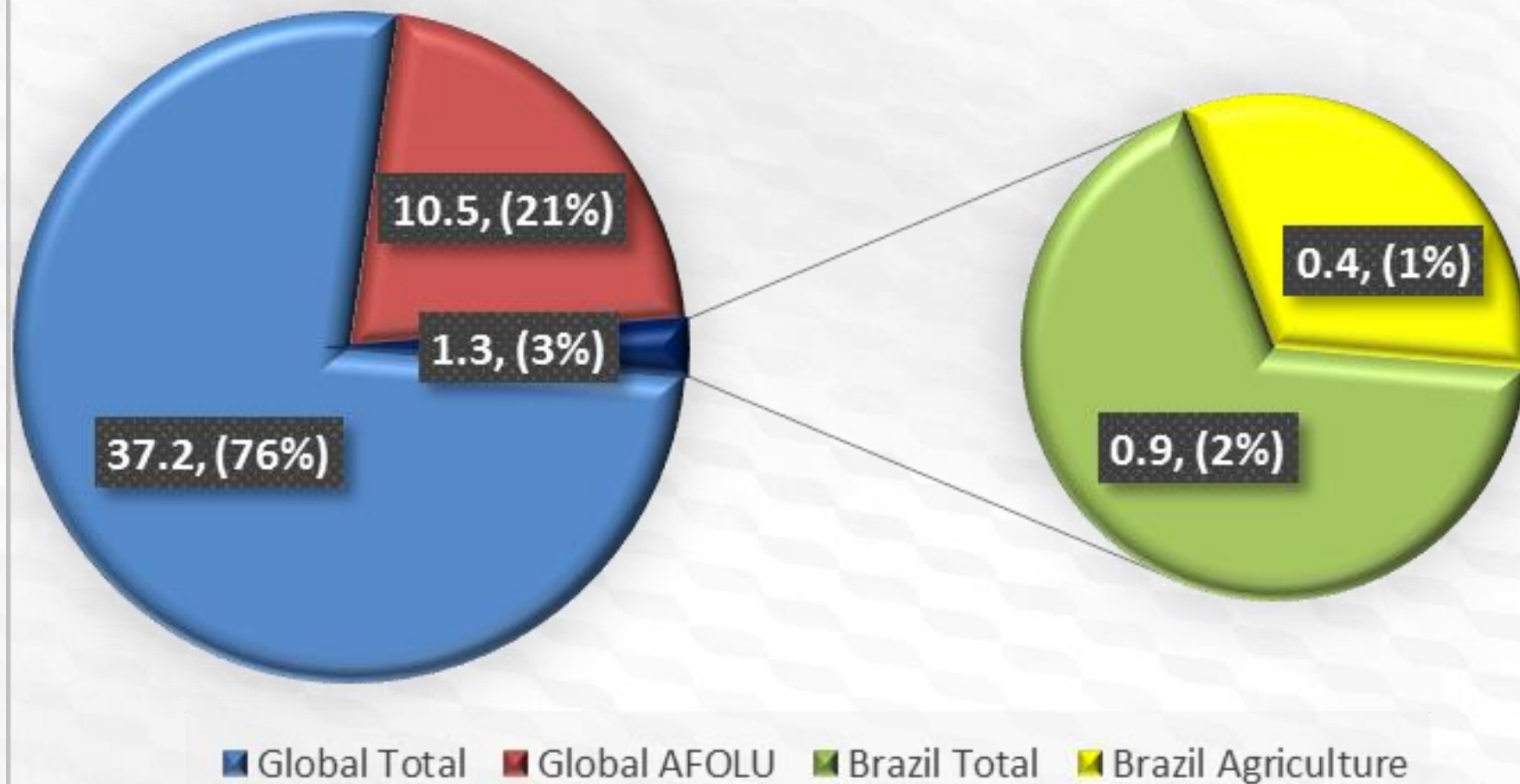
August, 28<sup>th</sup> 2018





Data is for CO2 emissions excluding land-use change and excluding bunker fuels. The EU is considered as a single

## Global and Brazilian emissions (Gg CO<sub>2</sub>e)



(MCTI, 2016)

# MCTI- National Inventories:



(MCT, 2006)



(MCT, 2010)



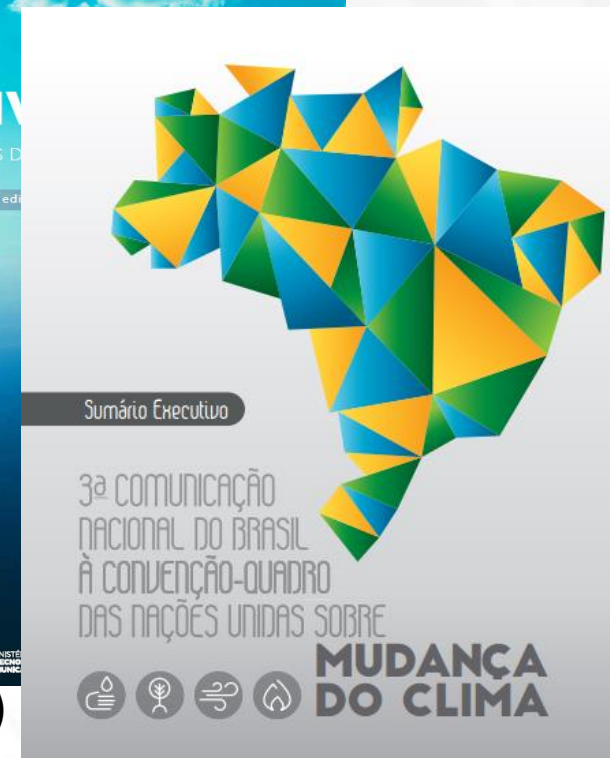
(MCTI, 2013)



(MCTI, 2014)

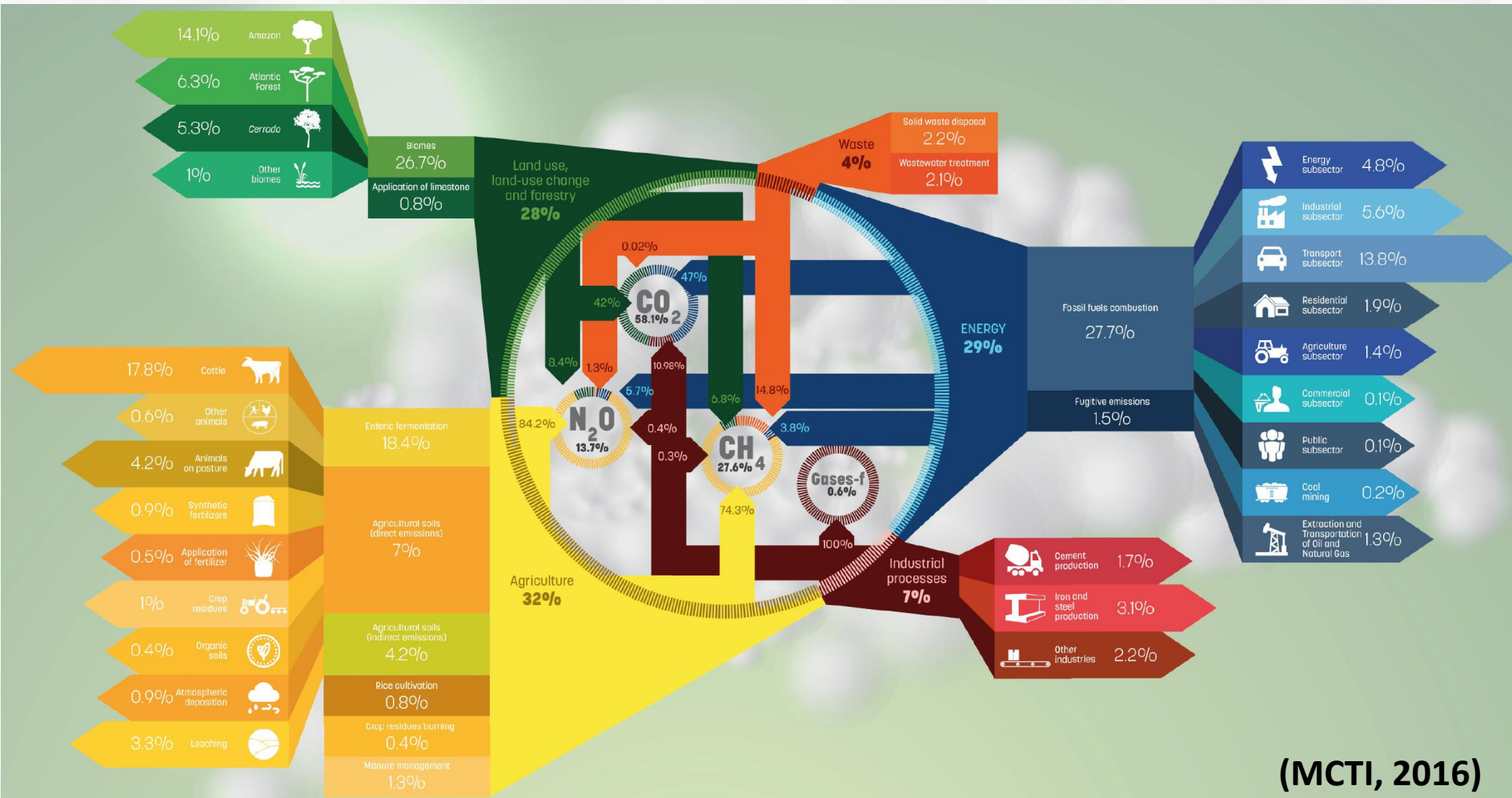


(MCTIC, 2016)



(MCTIC, 2016)

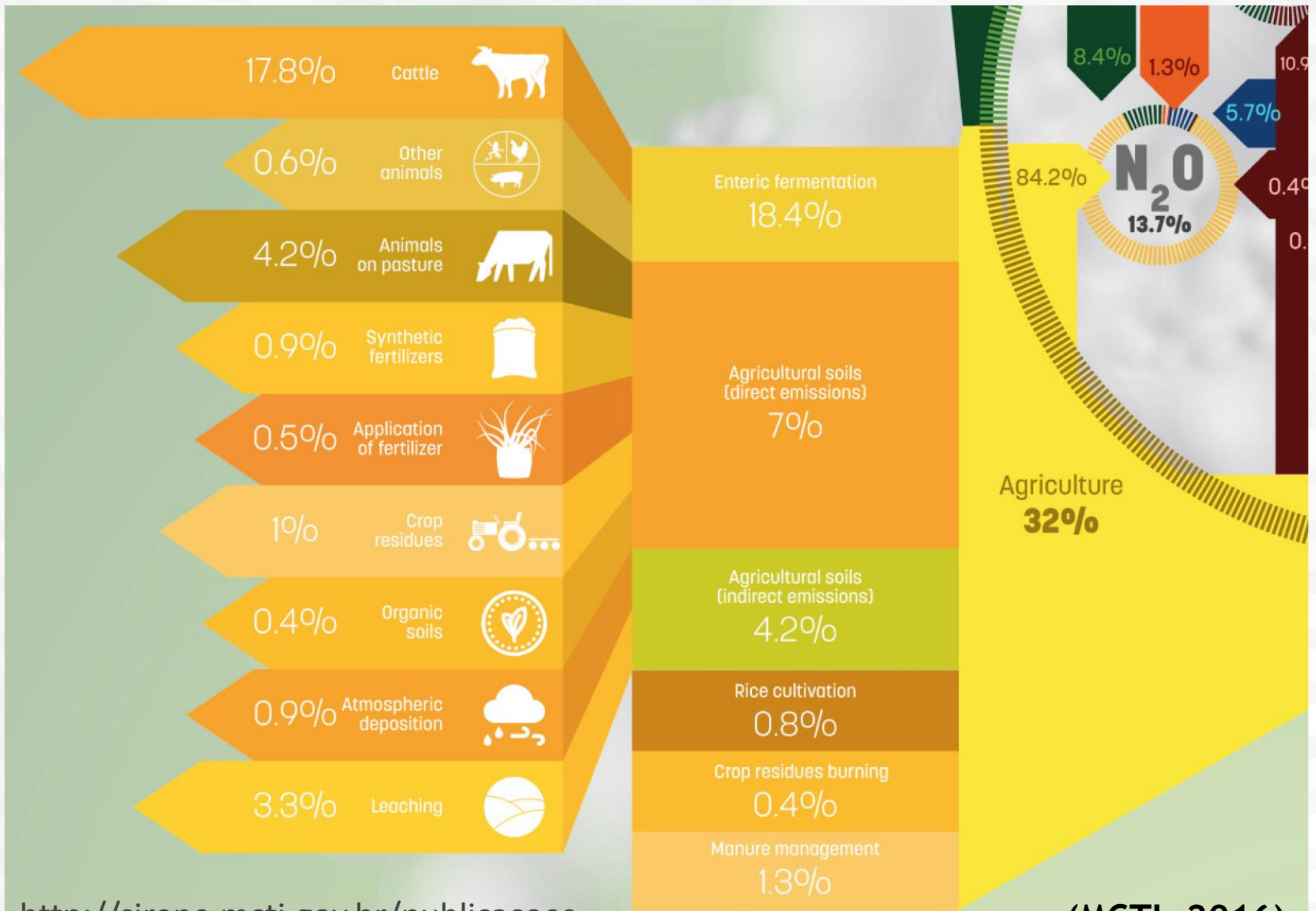
# Brazilian emissions



(MCTI, 2016)

<http://sirene.mcti.gov.br/publicacoes>

# Agriculture emissions



# Brazilian emissions

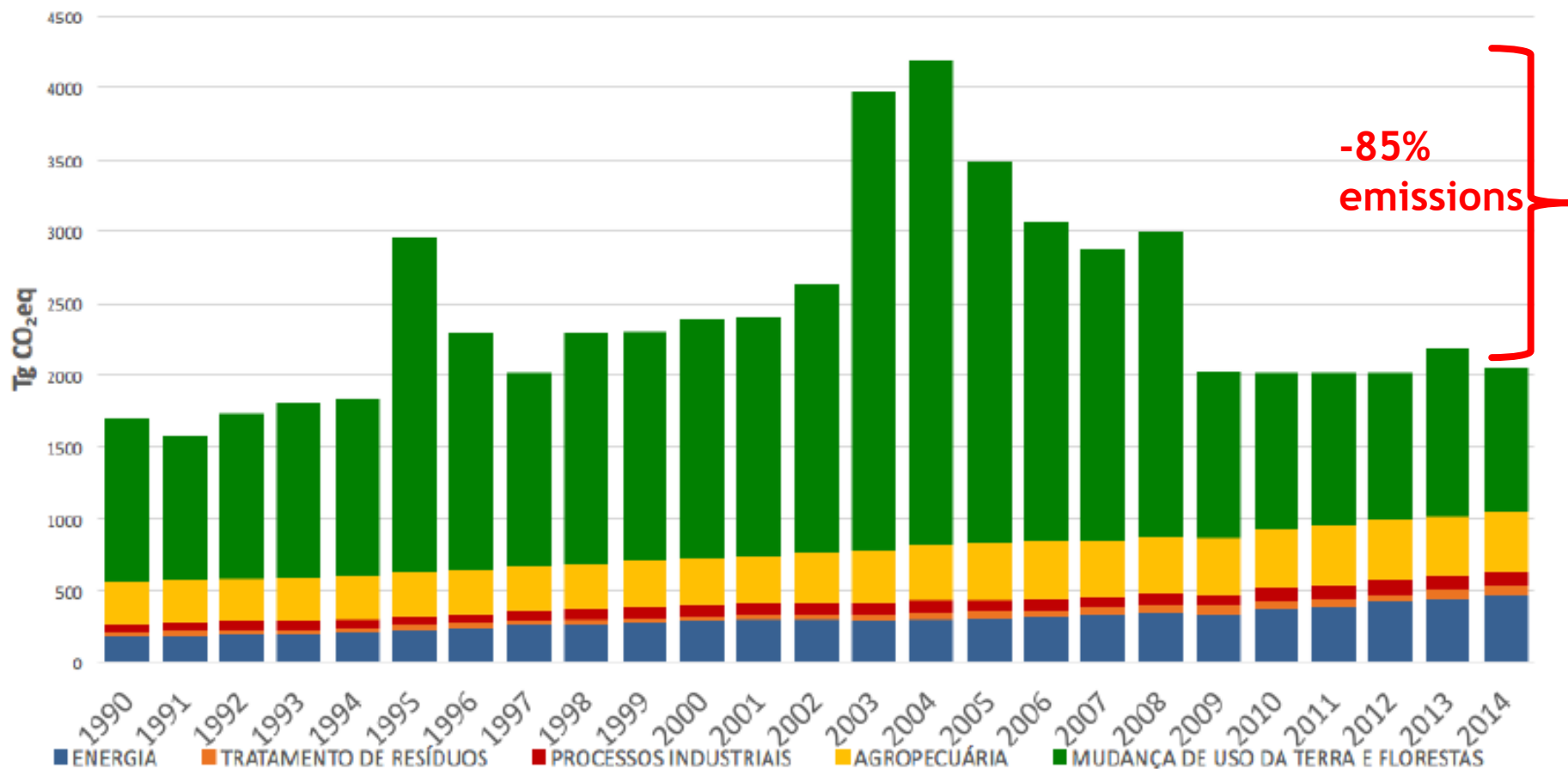
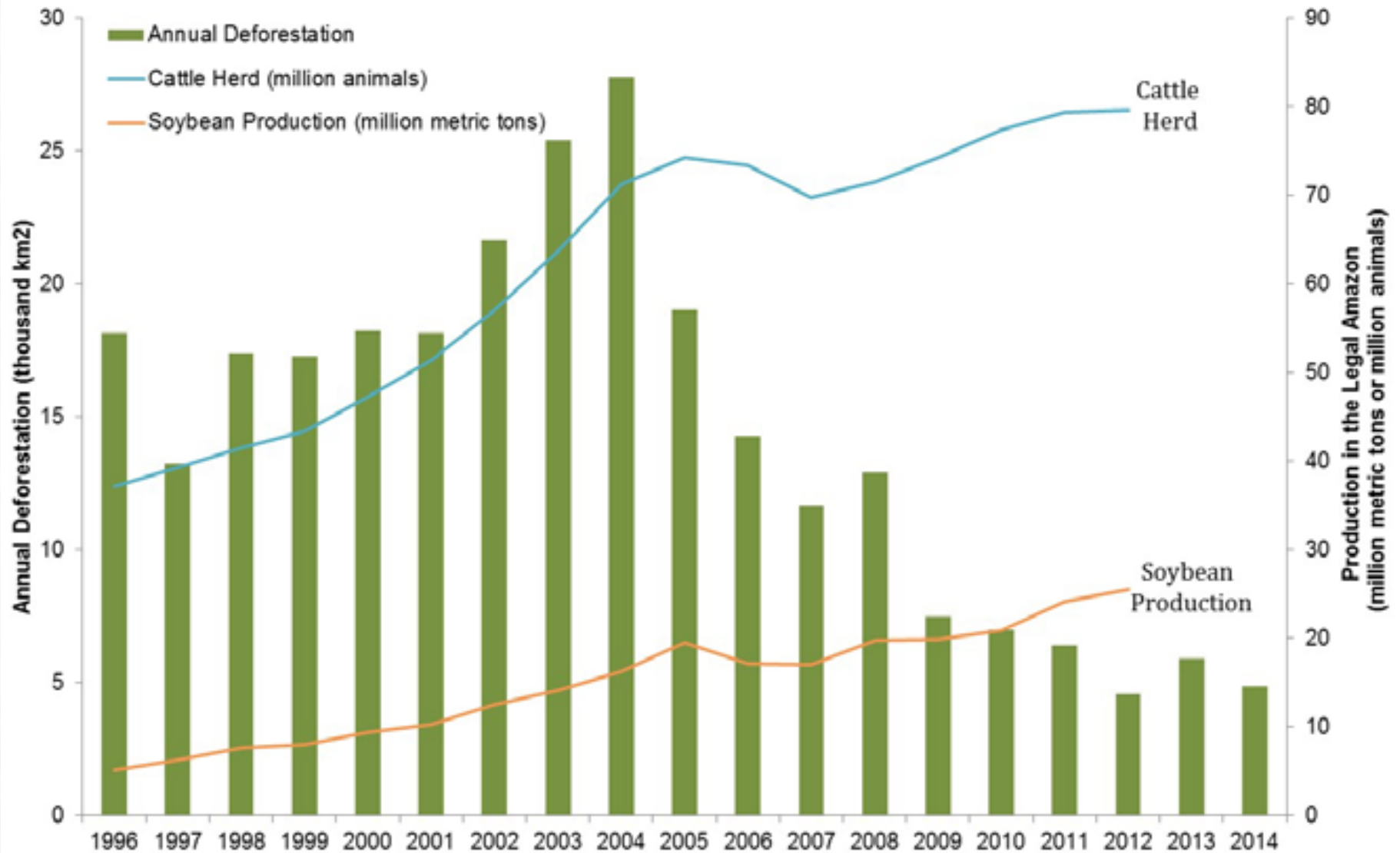


Figura II – Emissões brutas de gases de efeito estufa no Brasil, por setor, de 1990 a 2014 (Tg = milhões de toneladas).

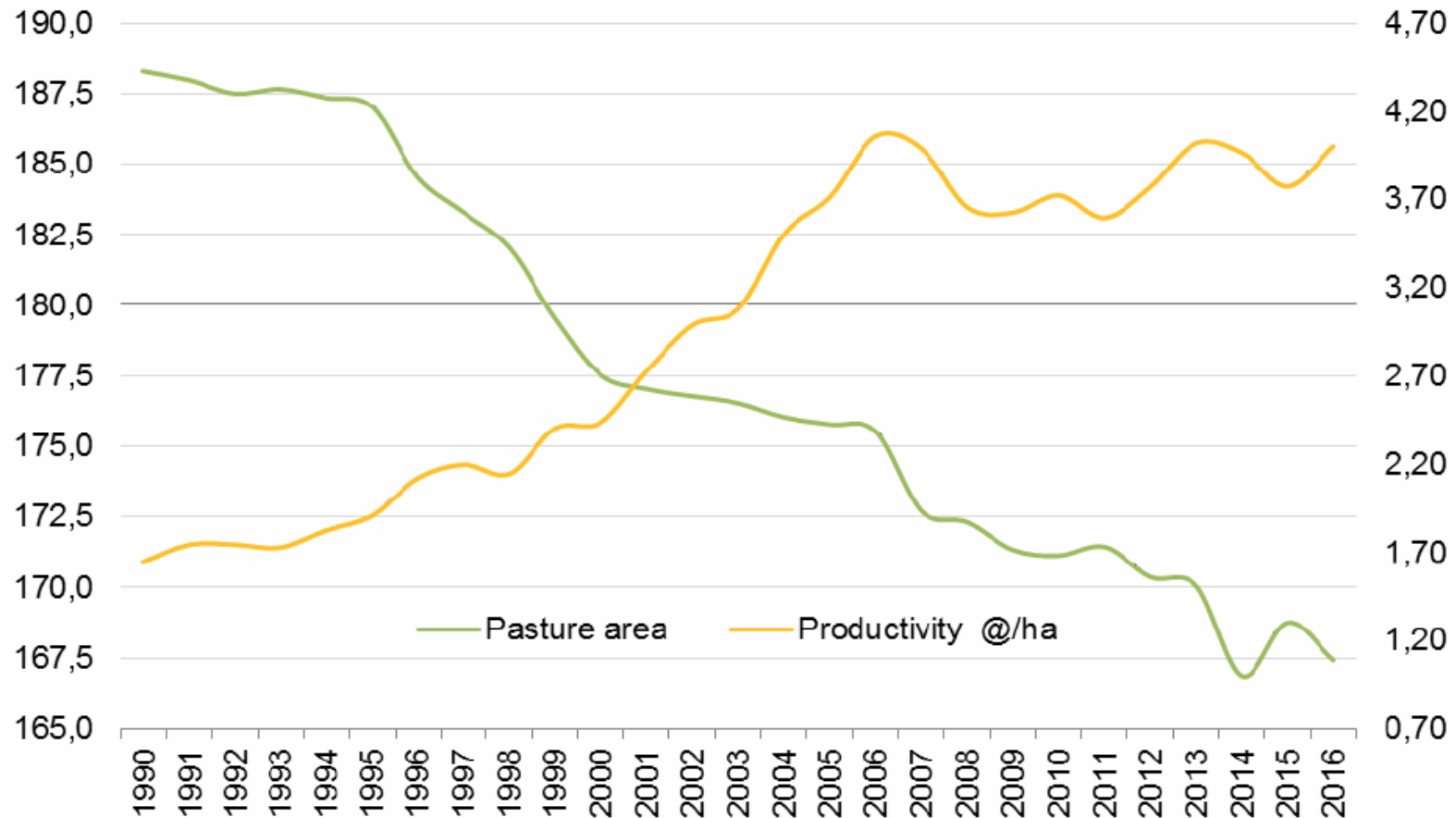
# Production vs. expansion decoupling



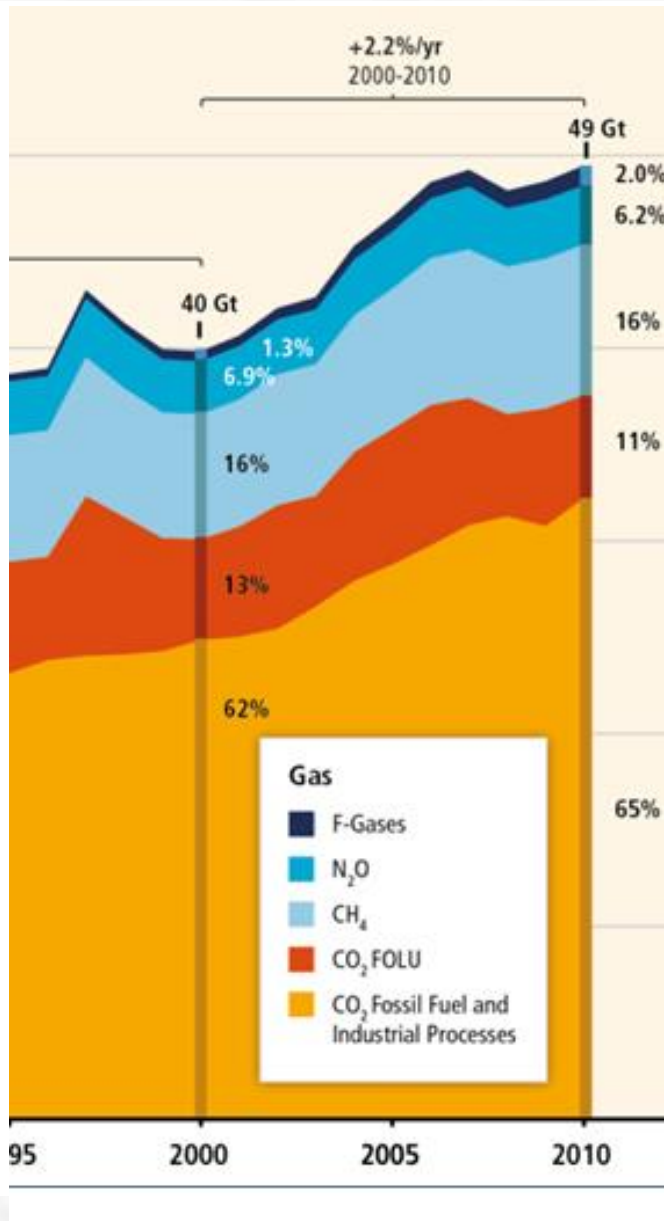


# Productivity

Pasture Area (mi ha) X Cattle herd Productivity (@/ha)



Source: Agroconsult/IBGE.



# GHG reduction?

- Total emissions  
GgCO<sub>2</sub>eq/year
- Emission intensity  
kg CO<sub>2</sub>eq/kg product
- Increase efficiencies

# Intensification can reduce emission intensity (until a certain level)



# Material and Methods:

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- 30 Canchim (5/8 Charolais) steers;
- 5 grazing systems;
- Extensive grazing (EXT);
- Intensive grazing (IGS);
- Silvopastoril (SPS)
- Integrated Crop-Livestock (ICL);
- Integrated Crop-Livestock-Forest (ICLF);
- 2 area repetitions;
- 4 seasons/year;



2006: início dos trabalhos com ILP na Embrapa Pecuária Sudest



2016: consolidação do sistema ILPF

# Results:

Variable	Treatments					Mean±SD	P
	IGS	SPS	ICL	ICLF	EXT		
LW (kg)	286,4 <sup>a</sup>	269,2 <sup>ab</sup>	241,8 <sup>b</sup>	267,1 <sup>ab</sup>	252,3 <sup>ab</sup>	264,1 ± 26,5	0,0402
ADG (kg/d)	0,652 <sup>a</sup>	0,579 <sup>ab</sup>	0,349 <sup>b</sup>	0,647 <sup>a</sup>	0,495 <sup>ab</sup>	0,551 ± 0,17	0,0077
CH <sub>4</sub> (g/d)	146,9	116,4	131,3	125,4	115,9	127,0 ± 30,9	0,4131
CH <sub>4</sub> LW (g CH <sub>4</sub> /kg LW)	0,515	0,434	0,542	0,471	0,460	0,482 ± 0,11	0,5282
CH <sub>4</sub> ADG (g CH <sub>4</sub> /kg ADG)	231,6 <sup>ab</sup>	208,4 <sup>b</sup>	415,4 <sup>a</sup>	205,3 <sup>b</sup>	257,5 <sup>ab</sup>	258,4 ± 124	0,0231

## Notícias

# Neutral Carbon Label: Integrated Systems: Agriculture + Livestock + Forest ≈ 10 to 20 trees to compensate 1 bovine AU



Carnes bovinas frescas, congeladas ou transformadas, para mercado interno ou exportação, poderão num futuro próximo receber um selo para certificar a sustentabilidade ambiental de sua produção. Registrada no Instituto Nacional da Propriedade Industrial (INPI), a marca "Carne Carbono Neutro" (CCN) será lançada oficialmente durante o II Simpósio Internacional sobre Gases de Efeito Estufa na Agropecuária (SIGEE), em Campo Grande (MS), entre os dias 7 e 9 de junho. A certificação ainda dependerá de negociações com os setores público e privado para a sua implantação e posterior transformação em selo.

A principal finalidade da marca-conceito CCN desenvolvida pela Embrapa é atestar a produção de bovinos de corte em sistemas com a introdução obrigatória de árvores como diferencial. Nessas condições, a presença do componente arbóreo em sistemas de integração do tipo silvipastoril (pecuária-floresta, IPF) ou agrossilvipastoril (lavoura-pecuária-floresta, ILPF) neutraliza o metano entérico (exalado pelos animais), um dos principais gases responsáveis pelo efeito estufa que provoca o aquecimento global.



# Conclusion:



Integrated CLF production systems can ensure higher productivity of animals, dilute the enteric methane emissions and enhance carbon sequestration in soils and timber.

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AGRICULTURE CONFERENCE



### Iguassu, destination of the world

Iguassu is located in the extreme west of the state of Paraná, on the borders between Brazil, Argentina and Paraguay, in the geographical center of Mercosur. Its ethnic and cultural diversity gives the city a rich and varied cosmopolitan touch.

**August 2019**  
**Iguassu - Paraná**  
**Brazil**

<http://ggaa2019.org/>



Thank you!  
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*Brazilian Agricultural Research Corporation  
Ministry of Agriculture, Livestock and Food Supply*