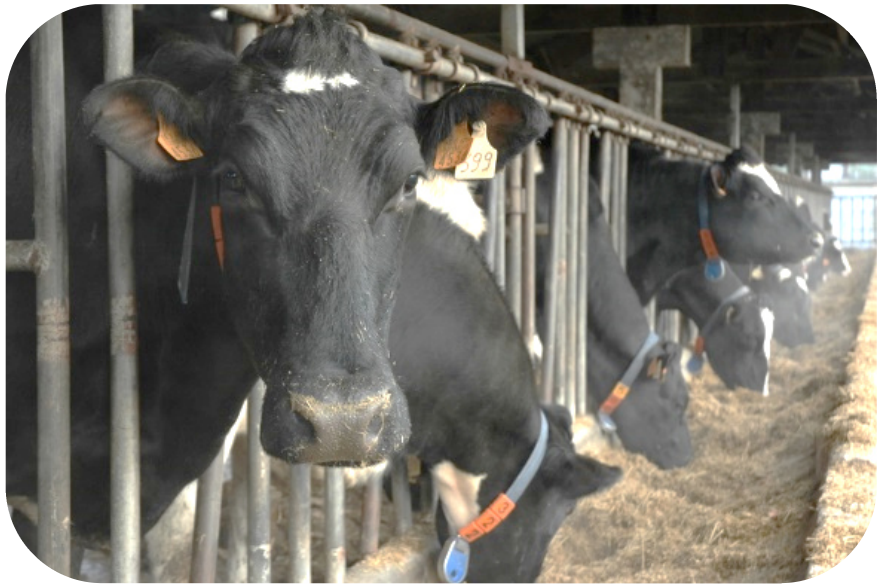
Methane mitigation through nutrition



Reality or illusion?

Symposium VLAIO LA traject *SMART MELKEN*

Thursday October 6th, 2016, Melle

ILVO

Innovatiesteunpunt

AGENTSCHAP INNOVEREN & ONDERNEMEN

ILVO
Instituut voor Landbouw- en Visserijonderzoek

VLAIO - SMART Melken

Nutritional steering towards an economical and ecological sustainable dairy farm: focus on methane and nitrogen-efficiency

4 year project: started on December 1th 2014

one of the goals: dissemination of knowledge
today focus on methane

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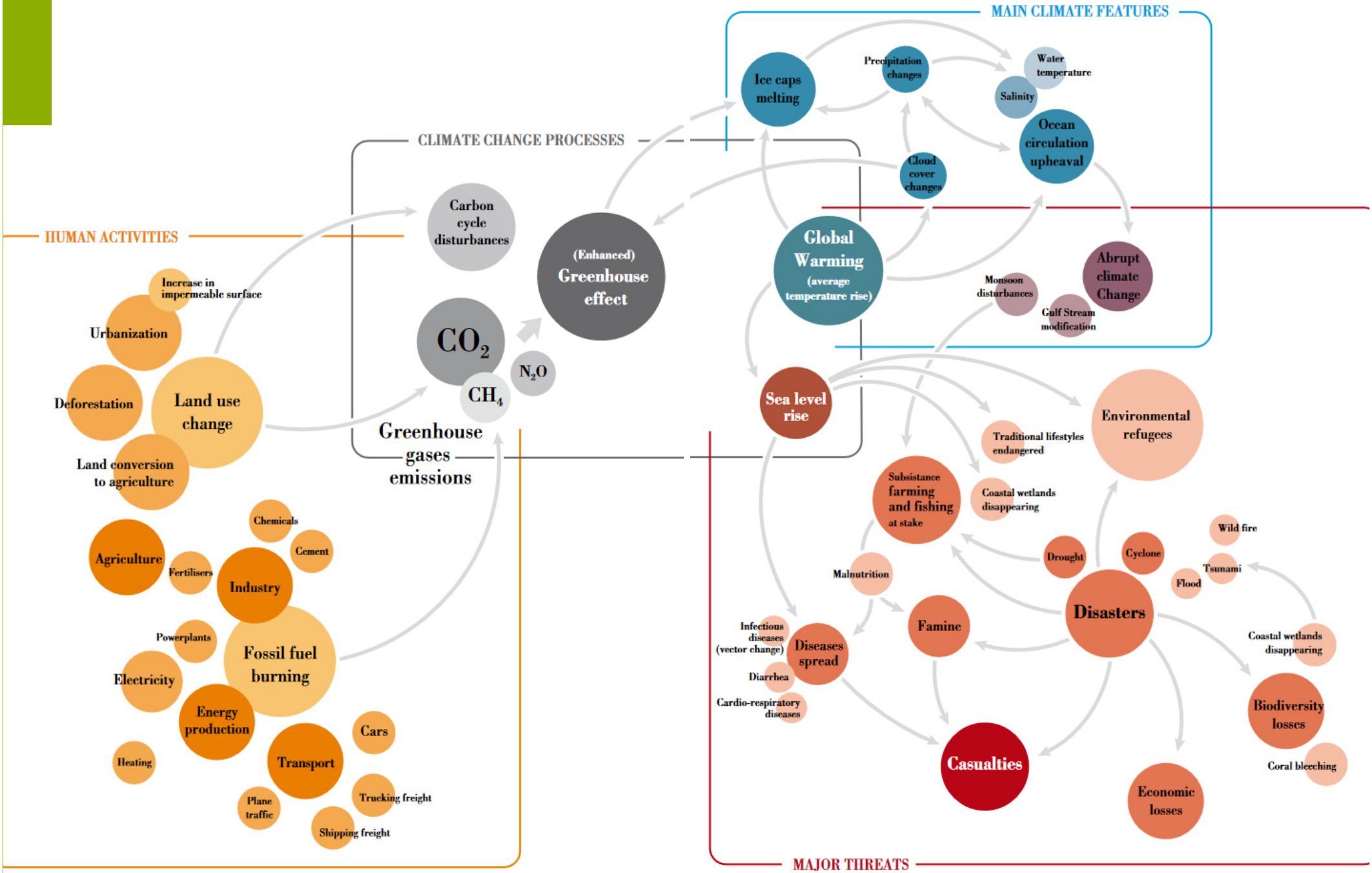


United Nations Environmental Program, 2008

http://www.grida.no/graphicslib/detail/climate-change-global-processes-and-effects_9cc5

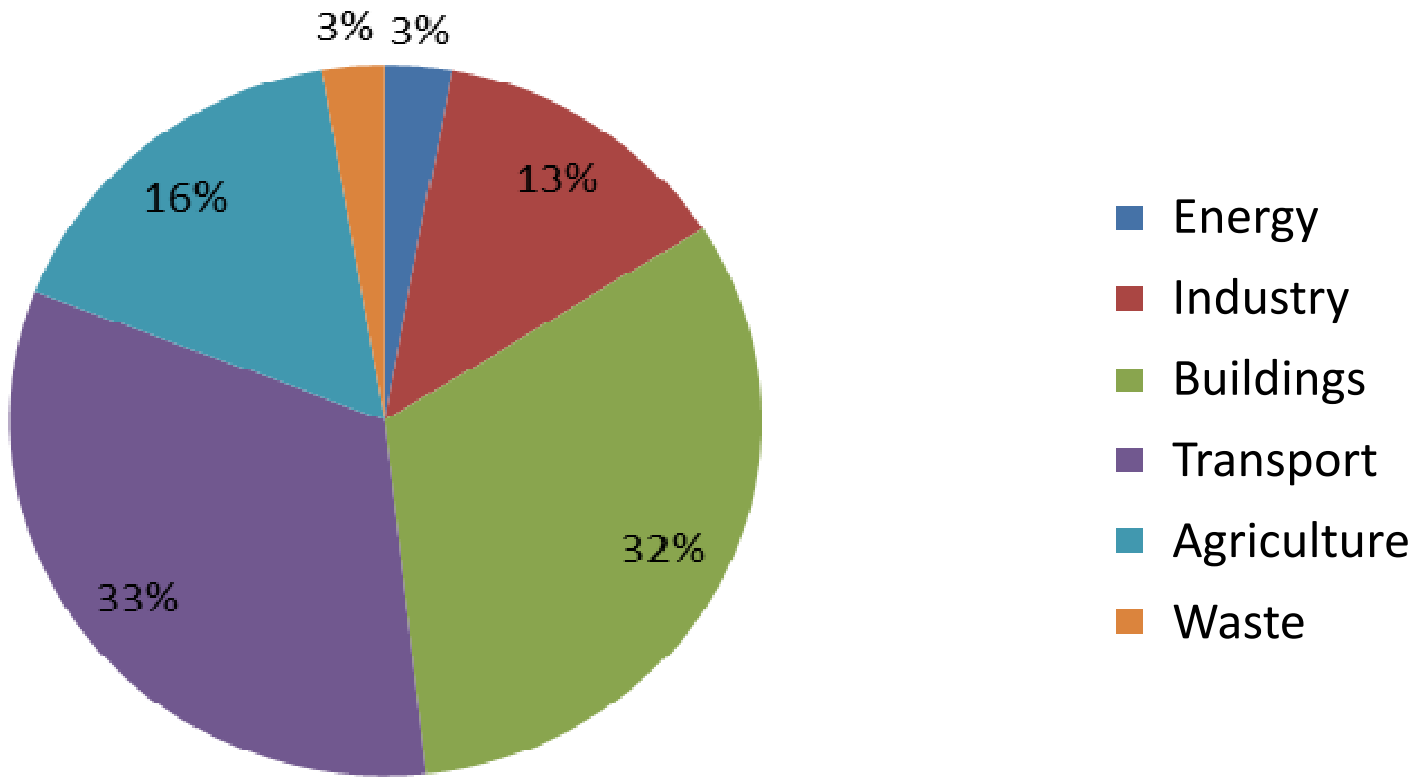
Agricult. contribution to GHG?

ETS (energy-intensive) vs non-ETS

Flanders:

> Agriculture: **8,2%** of total GHG (ETS + non-ETS). (VMM)

> Agriculture: **16%** of Flanders non-ETS emissions. (Vlaams Mitigatieplan)



distribution of GHG from non-ETS sectors in Flanders 2013 (bron: Vlaams Mitigatieplan)

Evolution GHG Flanders agriculture 1990-2013

- **26%** reduction **since 1990 (reference)** (Mira T rapport)

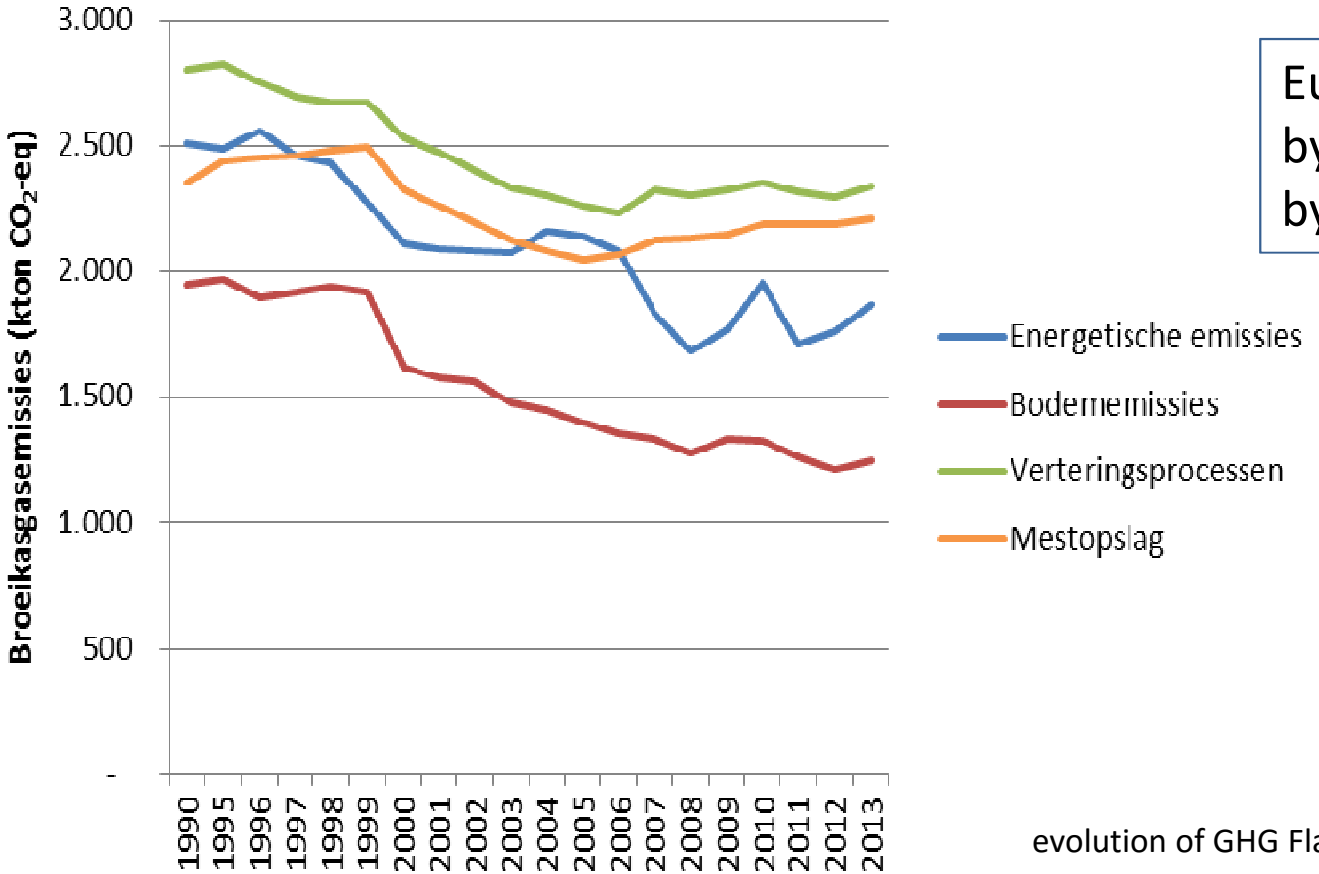
  > strong decrease 1990-2008, but stagnation from 2008

  > main causes of decrease

  a) decreased energy use in greeneries and stables

  b) reduction of livestock

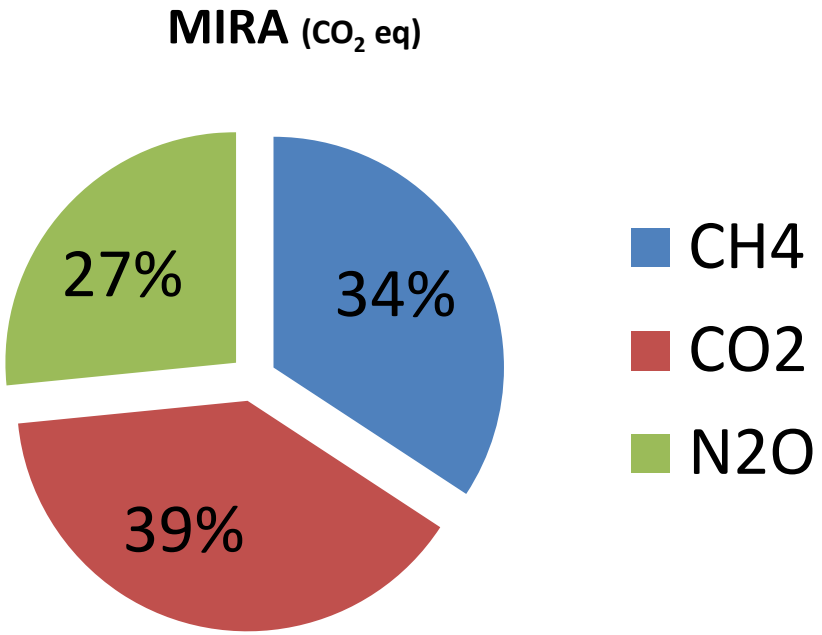
  c) adjusted fertilisation



European overall goal:
by 2030 40% reduction
by 2050 80% reduction

evolution of GHG Flanders agriculture (Vlaams Mitigatieplan, 2013)

Agricultural emissions Flanders by GHG



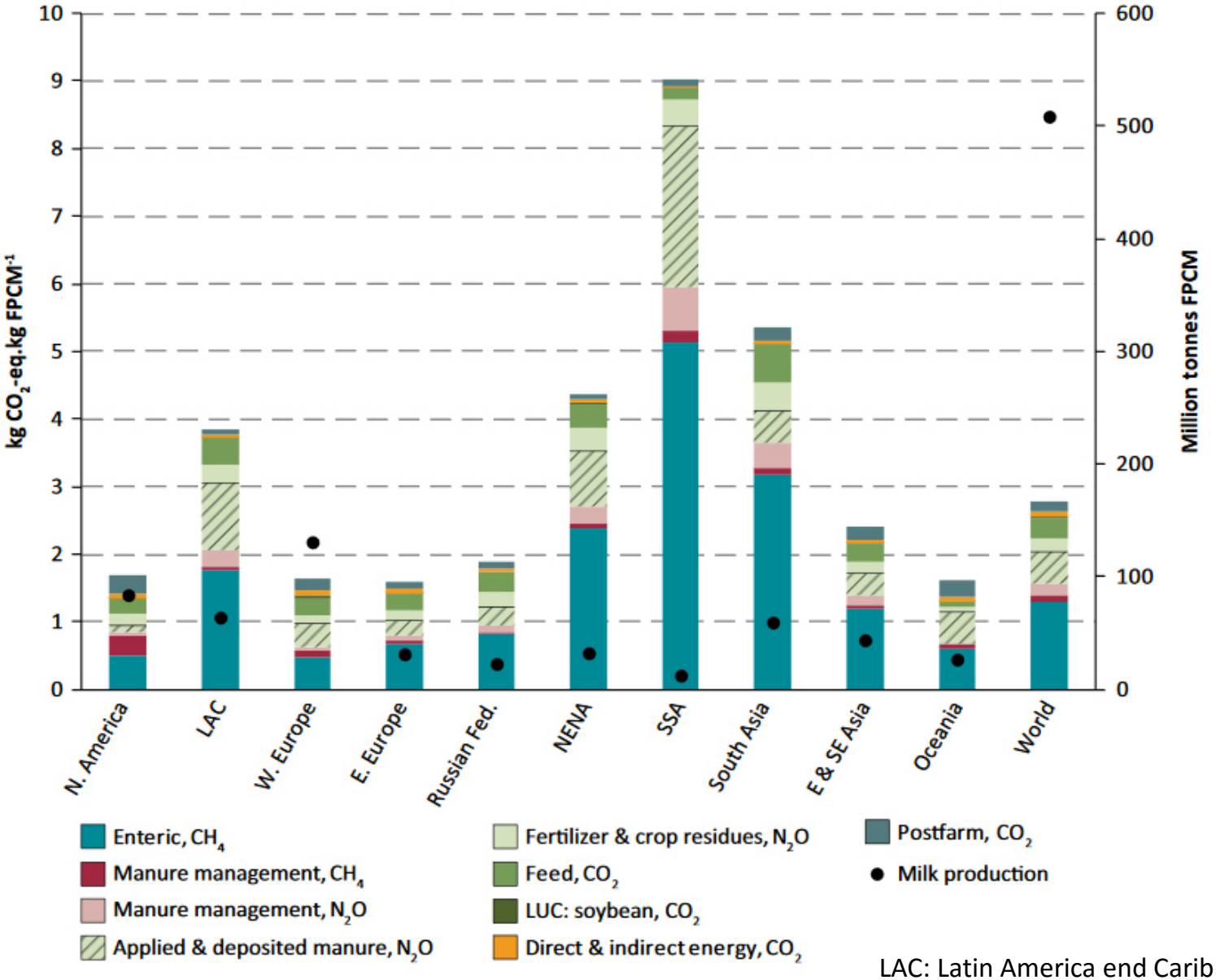
BKG		Jaar in atmosfeer	SAR (100)	AR5 (100)
Koofstofdioxide	CO_2	100-200	1	1
Methaan	CH_4	12	21	34
Lachgas	N_2O	121	310	298

CH_4 – basic facts

- The main sources of CH_4 in agriculture are the fermentation in the rumen (49%) and manure storage (44%) (pigs 38% - cattle 6%)
- A dairy cow produces 200 to 500 g of methane per day. This corresponds to 6-10% of the gross energy intake.
- The micro-organisms (methanogens), not the cow forms methane from H_2 and CO_2, which are formed during the anaerobic degradation of the feed.
- 90-95% CH_4 originates from the rumen and 5-10% is formed in the colon. The methane is then excreted through regurgitation (eating, ruminating), breathing and (very limited) by rectal excretion

Point of attention 1: mitigation measures may induce shifts

FIGURE 9. Regional variation in cattle milk production and GHG emission intensities



Source: GLEAM.

LAC: Latin America end Caribbean
NENA: NE and N africa
SSA: Sub Saharan Africa

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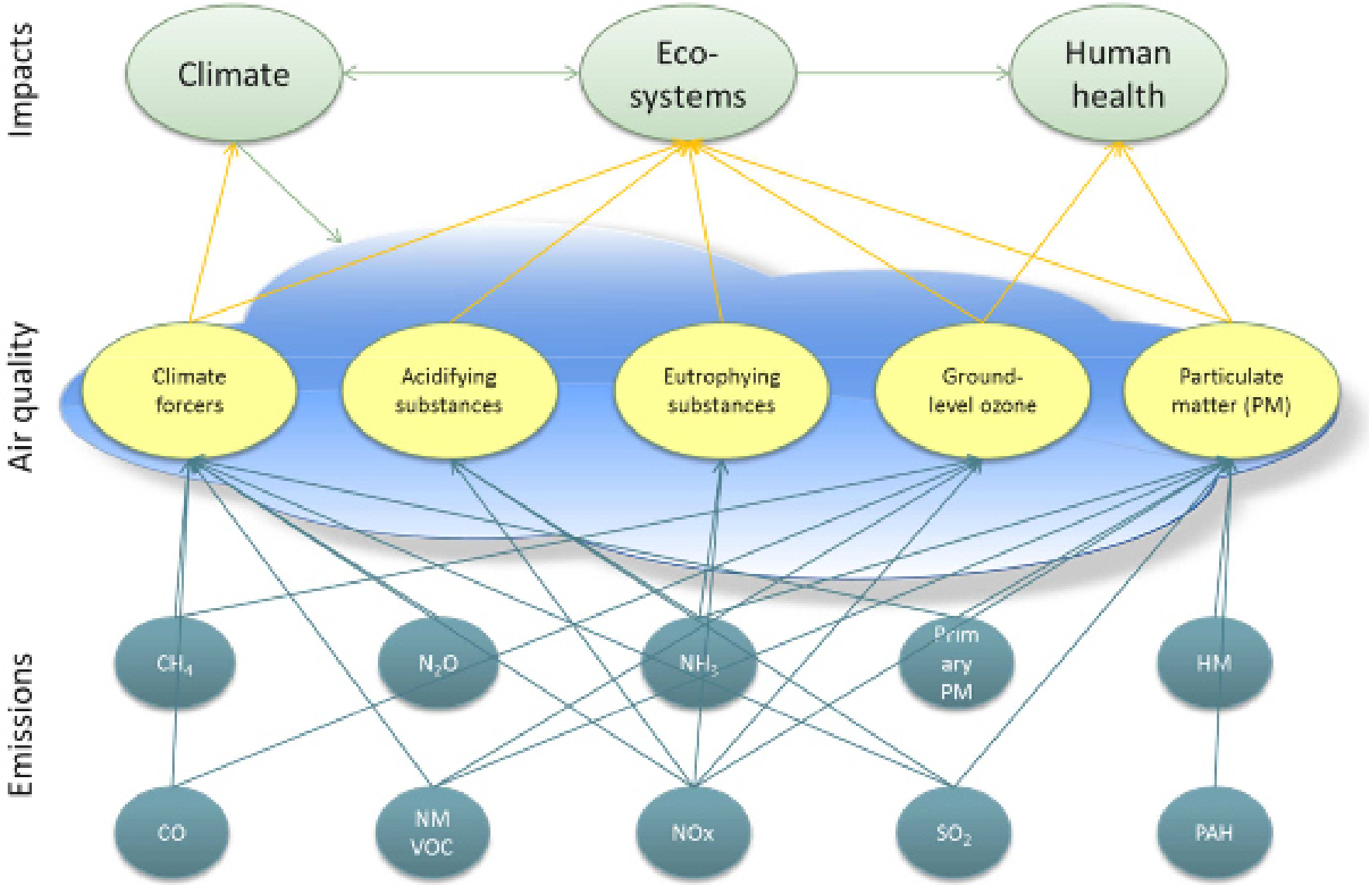
Point of attention 2: strong links with other environmental problems



EIP -AGRI Focus Group, Reducing emissions from cattle farming
STARTING PAPER

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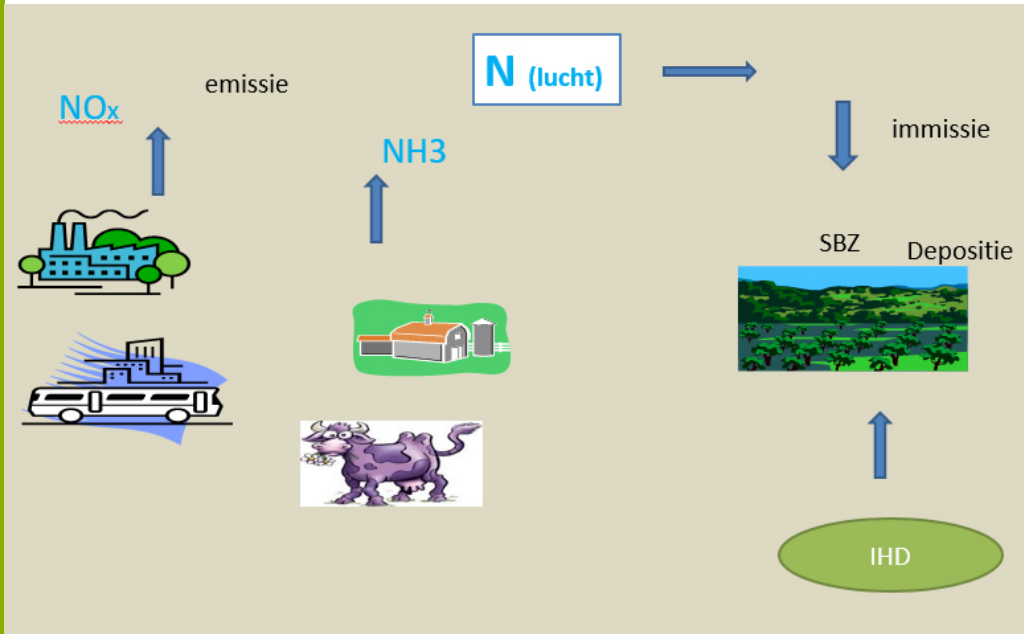
Interrelated environmental concerns

NH_3 - PAS

Local problem

Emissions from manure

Acidification / eutrophication

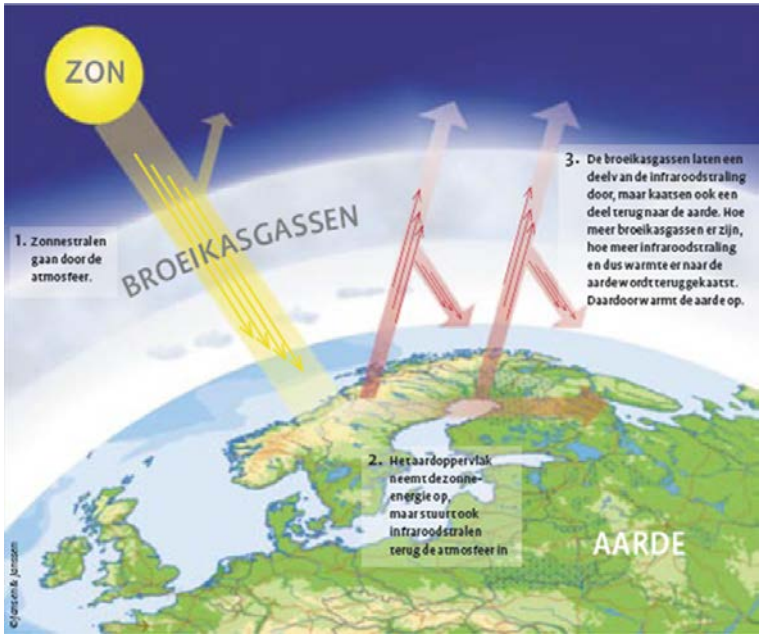


CH_4 - climate

World wide problem

Enteric + manure emissions

Global warming



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Overview projects delivering data or input

Running projects:

SMART melken (IWT) www.ilvo.vlaanderen.be/smartmelken
"Nutritional steering towards an economical and ecological sustainable farm: focus on methane and nitrogen efficiency"
partner: Innovatiesteunpunt
(today only methane aspect)

Rumen stability (EU-FACCE)
"Understanding the development and control of stability in the rumen microbiome as a basis for new strategies to reduce methanogenesis"
partner: Lanupro Ugent

GA genomics (ILVO) www.ilvogenomics.be
"Deep diving in the genomic diversity of populations"

Different smaller ILVO-research trials (ILVO)

Finished project:

SMEthane (EU) www.smethane.eu
"Technological platform to develop nutritional additives to reduce methane emissions from ruminants"
partners: Lanupro Ugent + partners from UK, Spain, France, Switserland