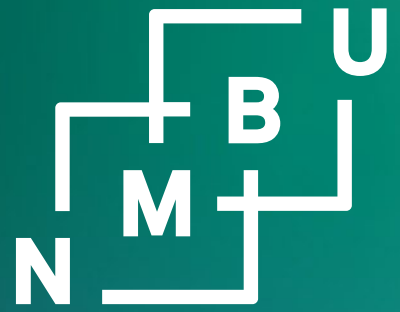


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# Assessing the climate impact of Norwegian dairy production

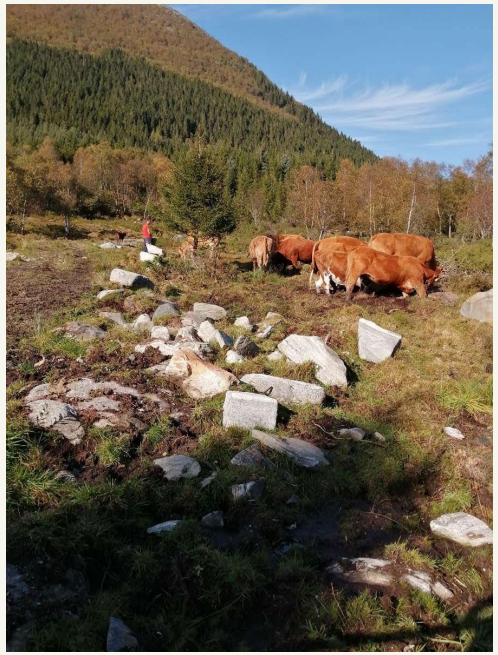
M. Olsen Wedaa, S. Samsonstuen, H. Bonesmo, B. Aspeholen Åby, E. Kjesbu, M. Bergfjord, R. Okstad, E. Gribbestad Gustafsson, J. Wiik, K. Gran Bergsholm

EAAP conference in Florence

Session 88, Abstract number 2216112

# Background

- Voluntary climate agreement between the farmers associations and the Norwegian government.
  - 2021 – 2030 = reduce 5 mil tons $CO_2$-eq.
- 1 of 9 initiatives = GHG-calculator and farm advisor.
  - Documentation and tool for farmers/advisors for Norwegian conditions.

# Climate smart agriculture

- 15 industry partners.
- #1 Develop a practical (FREE!) web-based tool for all production types and for farm advisors.
- #2 Calculate and document Norwegian carbon footprints.
- Ambitious digitalisation project.
  - Automatic data collection and GHG-calculations → GHG-calculator.

Klimasmart Landbruk

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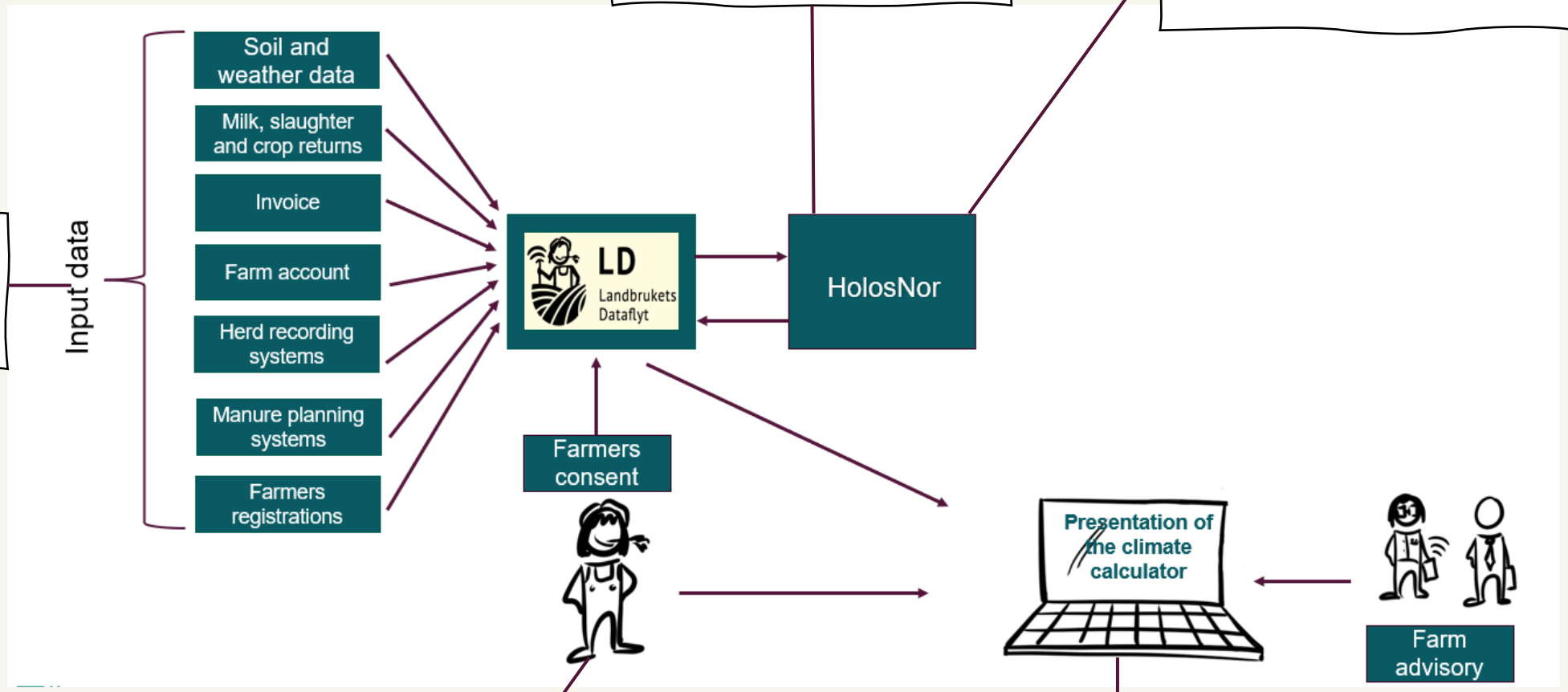
https://klimasmartlandbruk.no/

# GHG-calculator

Dairy cattle, beef cattle, sheep, poultry, swine, grain, grass and potato.

Published scientific models.
Cradle to farm gate.
IPPC guidelines.

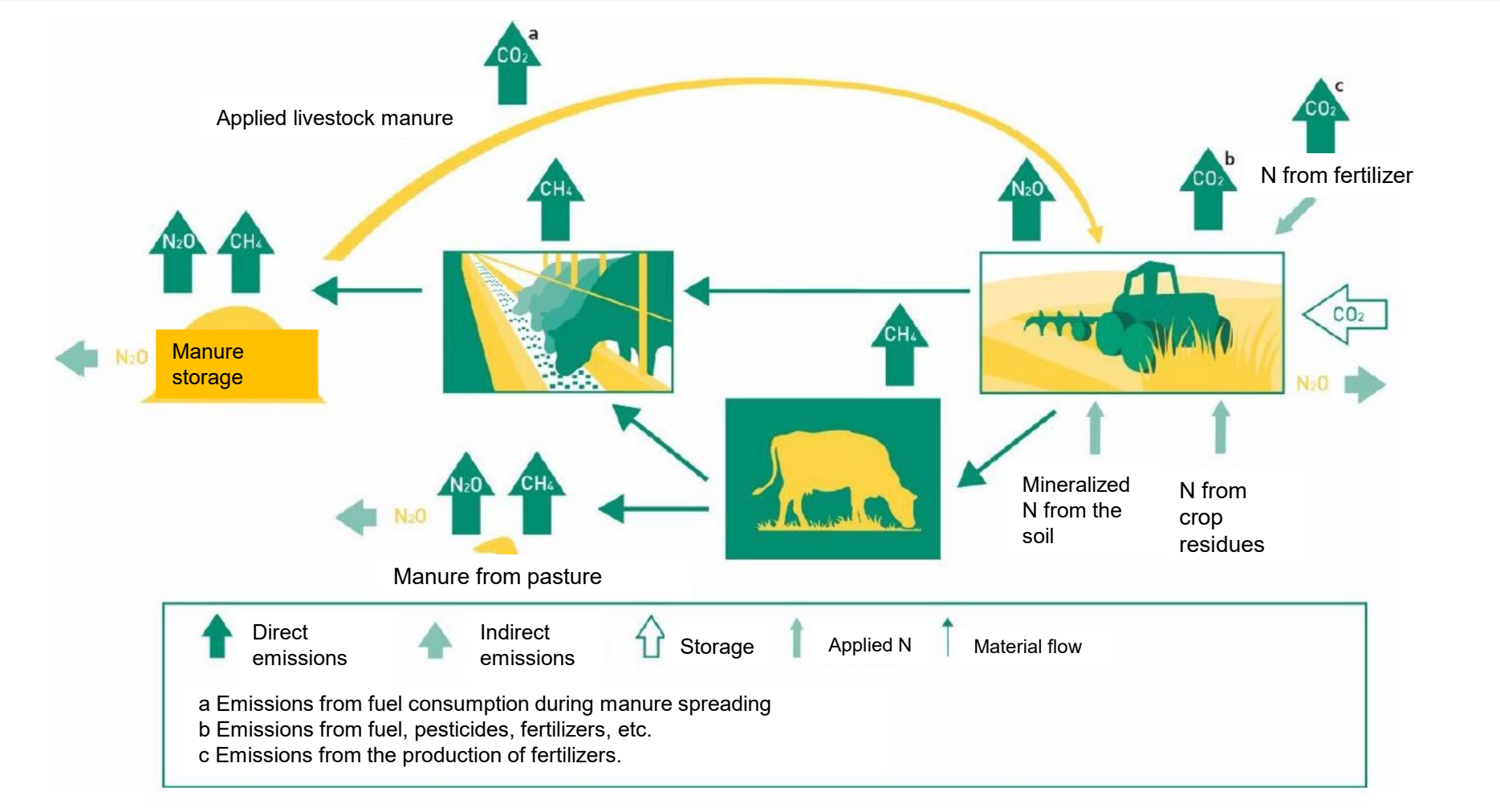
Automatically collected.




Ca.9000 farms.
70% dairy production.

Emission intensities:
Kg $CO_2$-eq per unit product.
Kg $CO_2$-eq in total.

# HolosNor – model description

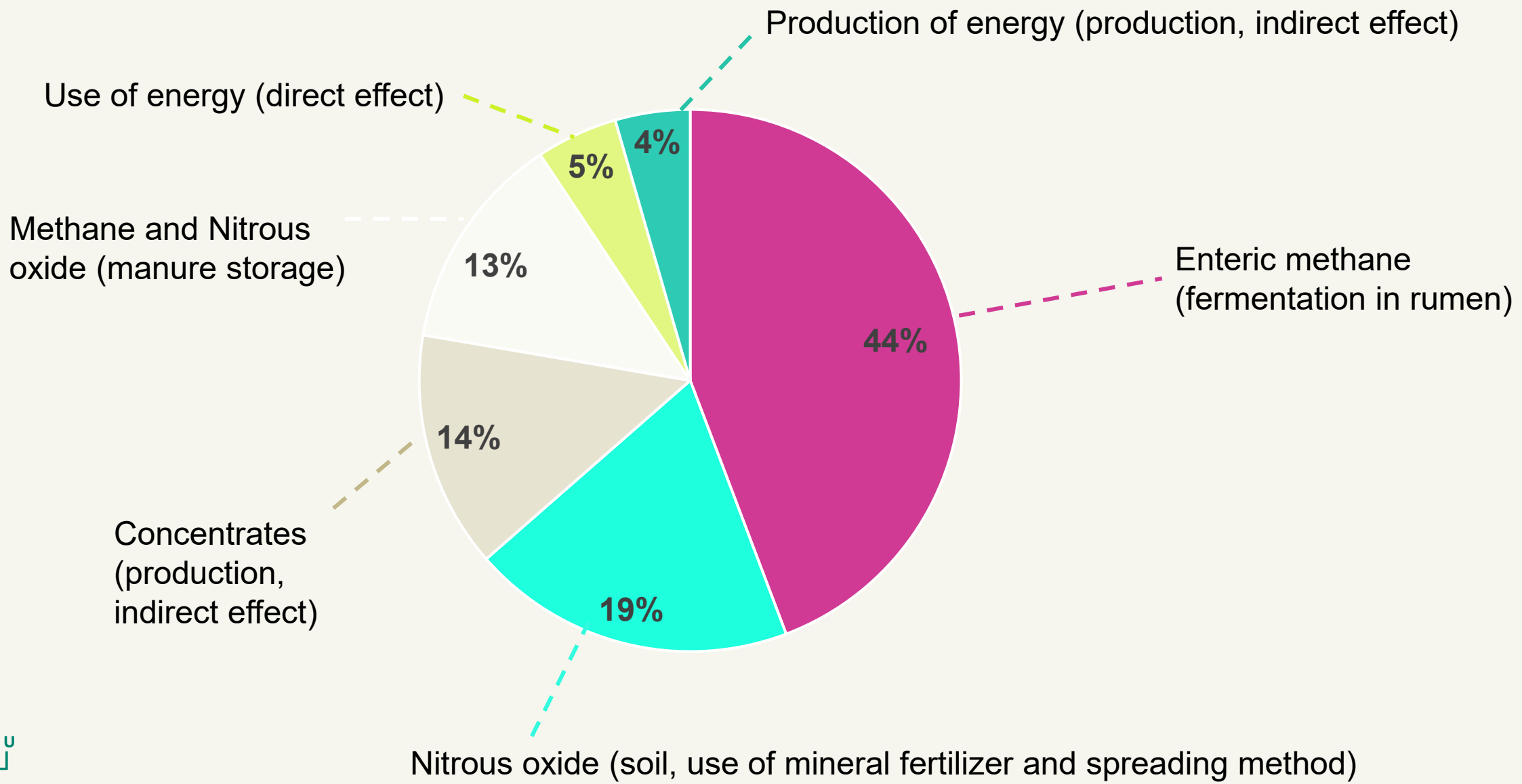



Bonesmo et al., 2013

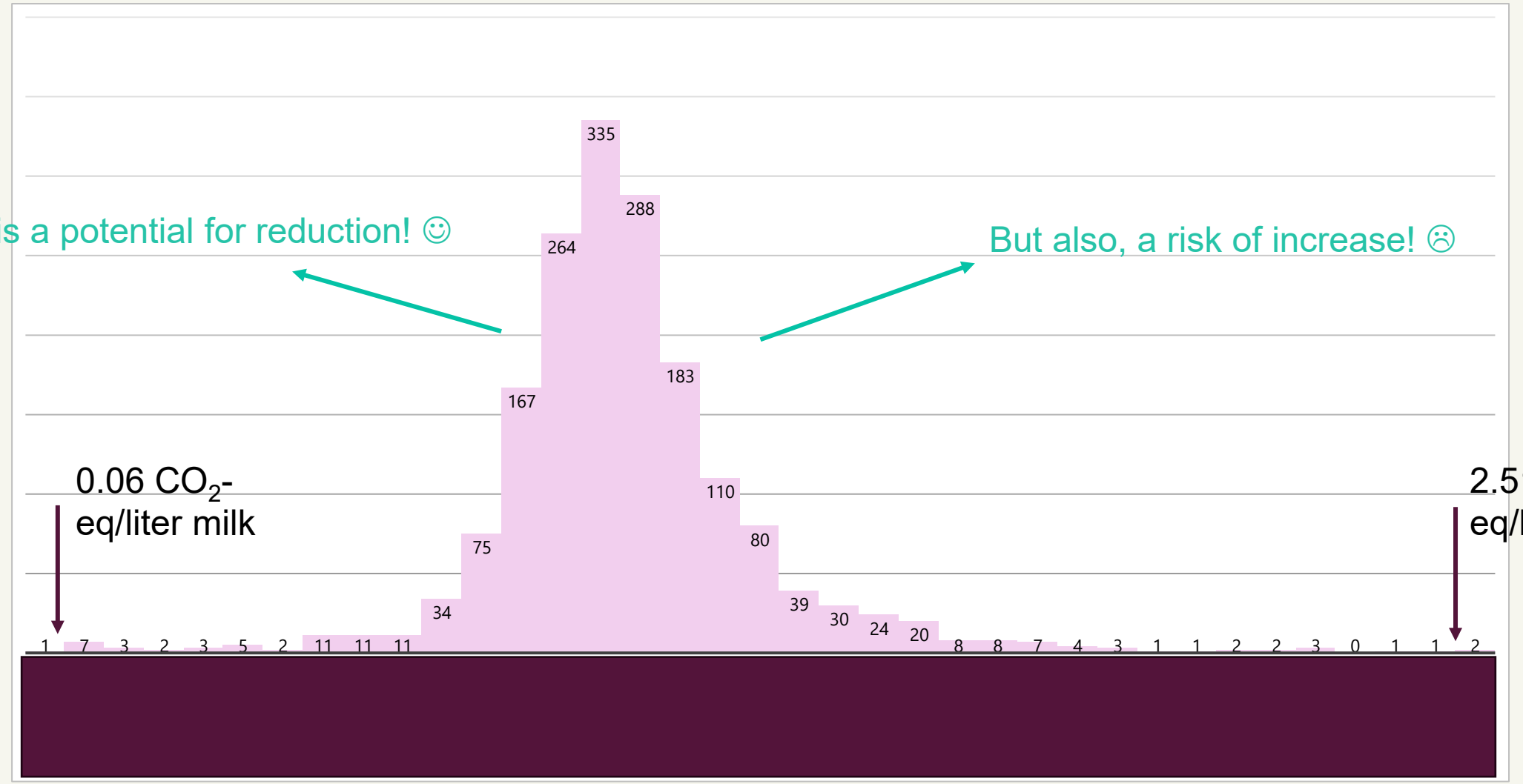
# The first analysis of the large-scale dataset from the GHG-calculator

- Quality control gave dataset of N = 1000 dairy farms.
- 2023 – data.
- Results are preliminary.
- Goal of analysis:
  - Which GHG-emissions are main sources?
  - Is there any variation in the emission intensities?

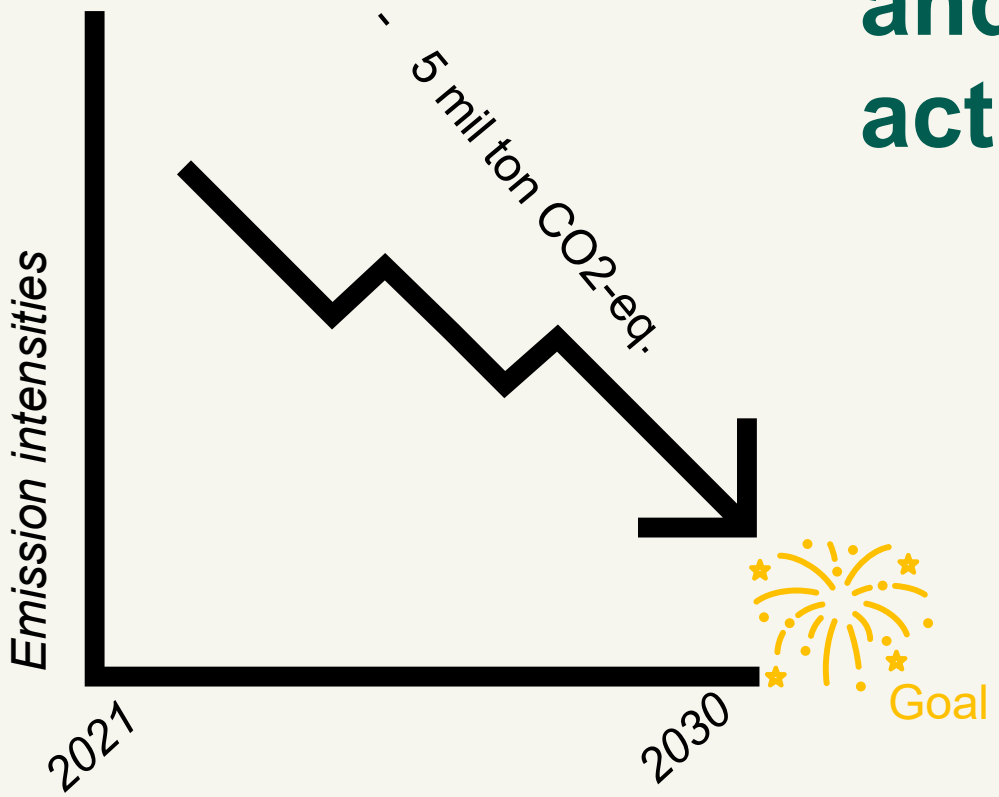
# GHG-emissions sources



# Variation in emission intensities



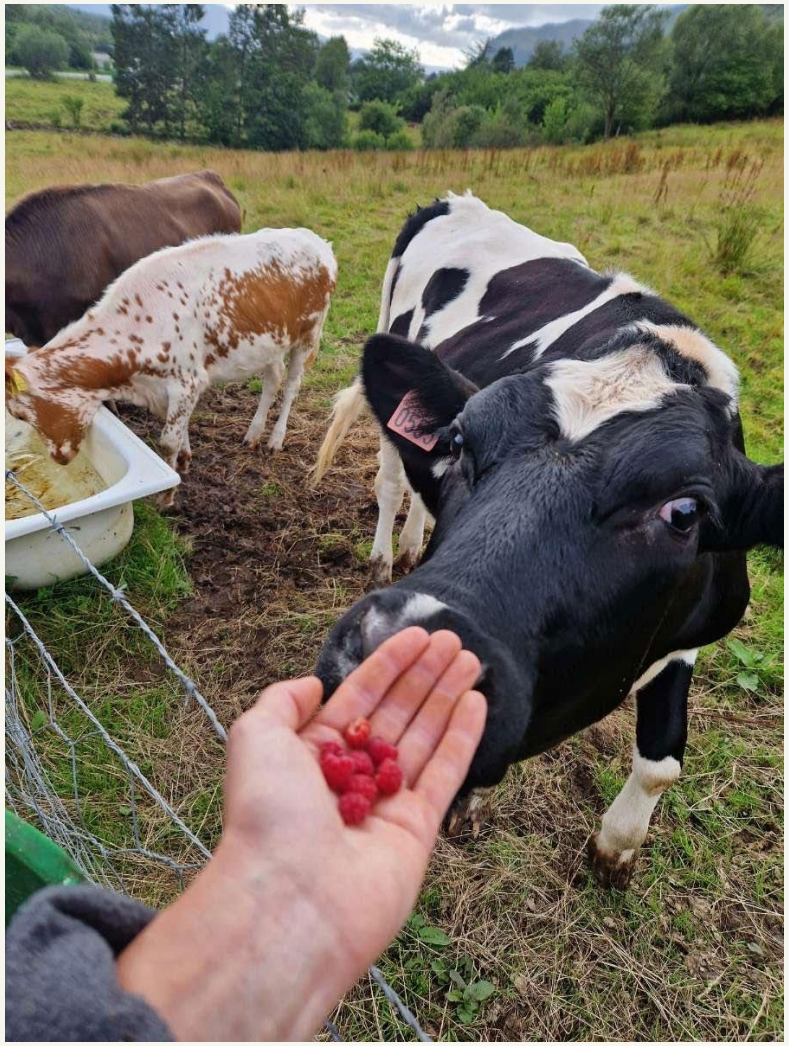

*numbers on bins is N




**Once we understand the current status, we can track and measure the effects of our actions over time.**

# Discussion

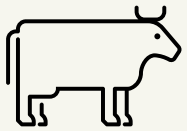
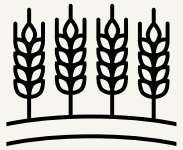
- Large range of variation → differences in management → mitigation options.
- Enteric methane largest source.
  - Optimal feeding.
  - Feed efficiency.
  - Feed additives.
  - Good health/animal welfare.
- Nitrogen oxide from soil second largest source.
  - Precision farming.
  - Spreading method of manure.



# Summary

- The GHG-calculator is implemented for Norwegian farmers and advisory services.
- This is the first analysis of a large-scale dataset from the GHG-calculator.
- Methane and nitrogen oxide from soil is the most important emission sources.
- There is a large variation in the emission intensities.

→ GHG-calculator is an adapted tool to reduce GHG-emissions from farms.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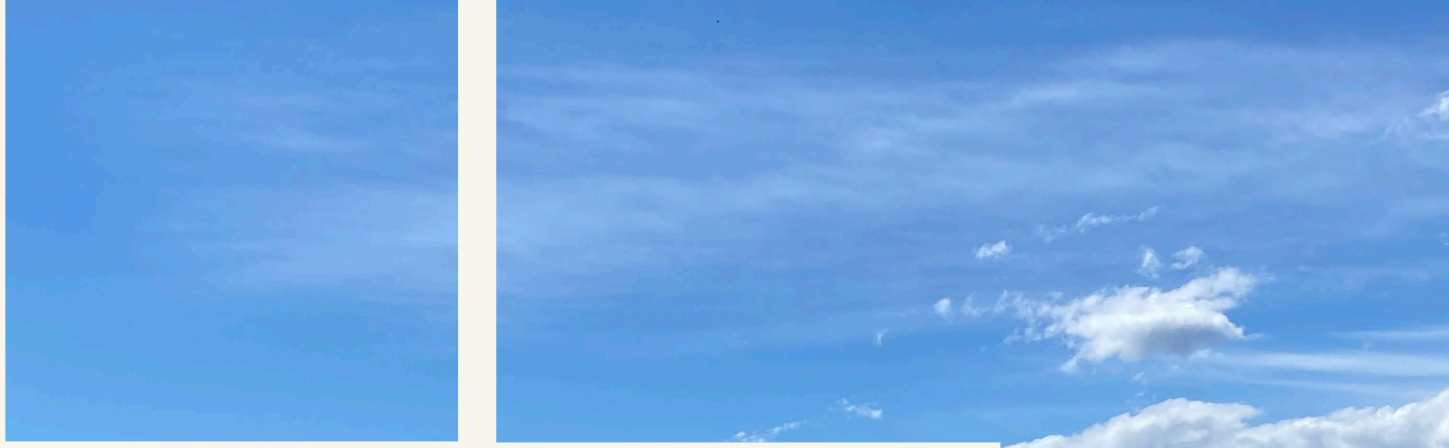

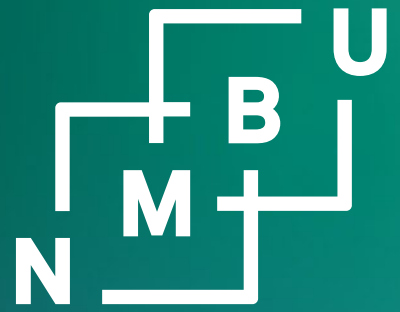


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