

# Zero Greenhouse Gas Emission in High Productive Agriculture - Warmly Welcome

Professor Jørgen E. Olesen



# Conference background

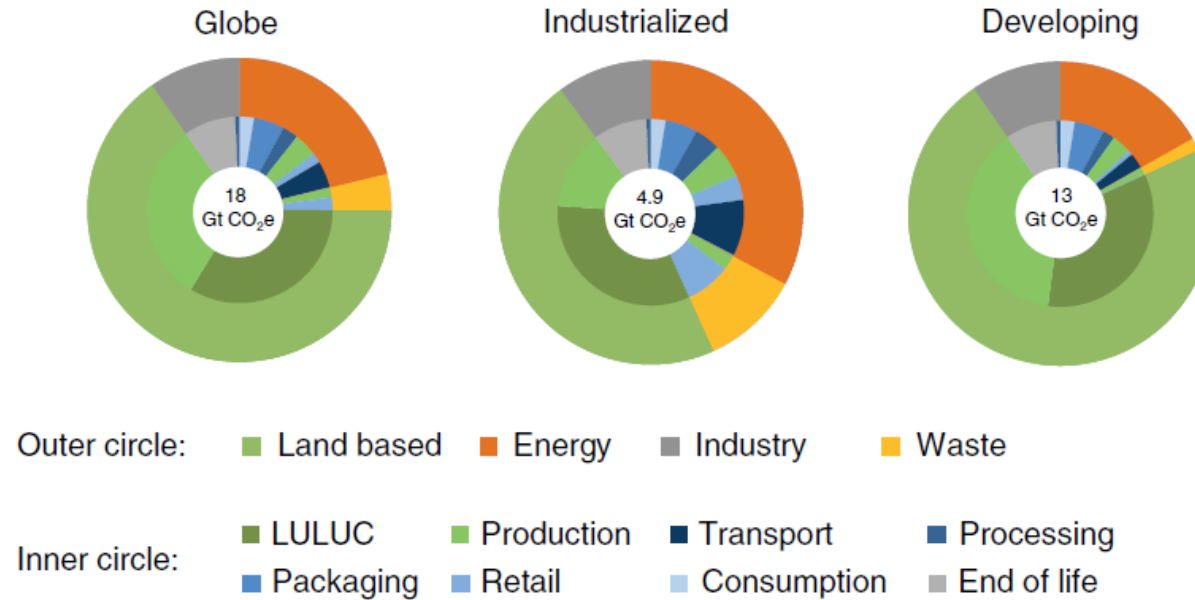
Greenhouse gas emissions from agriculture originate from livestock, manure, soils, land use and fossil fuels.

Society is increasingly successful in reducing emissions from non-agricultural sectors, and within a few years, agriculture will be the sector with the largest greenhouse gas emissions, unless new production systems and technologies are introduced.



# Food systems are responsible for a third of global anthropogenic GHG emissions

M. Crippa<sup>1</sup>✉, E. Solazzo<sup>1</sup>, D. Guizzardi<sup>1</sup>, F. Monforti-Ferrario<sup>1</sup>, F. N. Tubiello<sup>1,2</sup> and A. Leip<sup>1</sup>✉



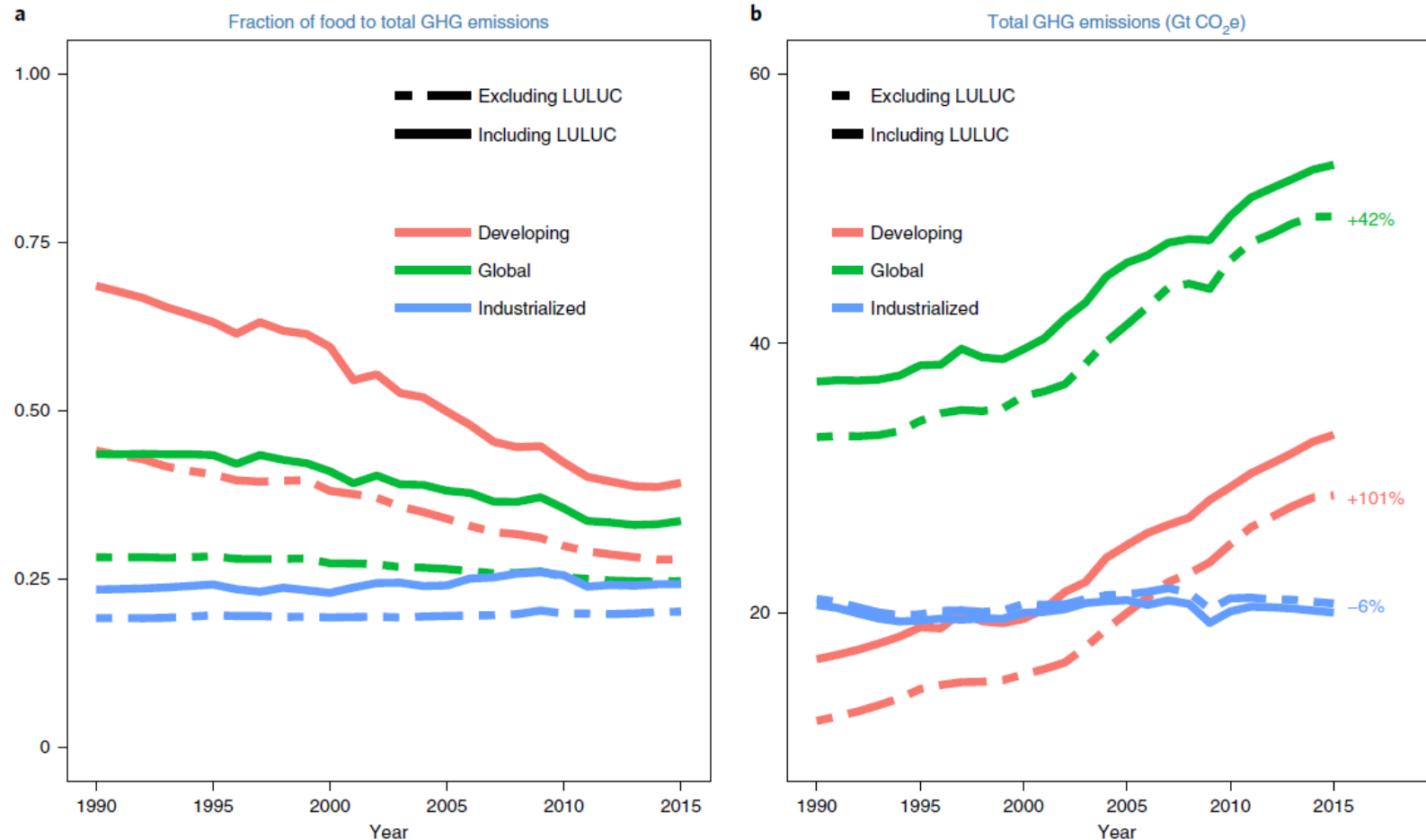
**Fig. 1 | GHG emissions from the food system in different sectors in 2015.**

Total GHG emissions (including CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and F-gases) are expressed as CO<sub>2</sub>e calculated using the GWP100 values used in the IPCC AR5, with a value of 28 for CH<sub>4</sub> and 265 for N<sub>2</sub>O.



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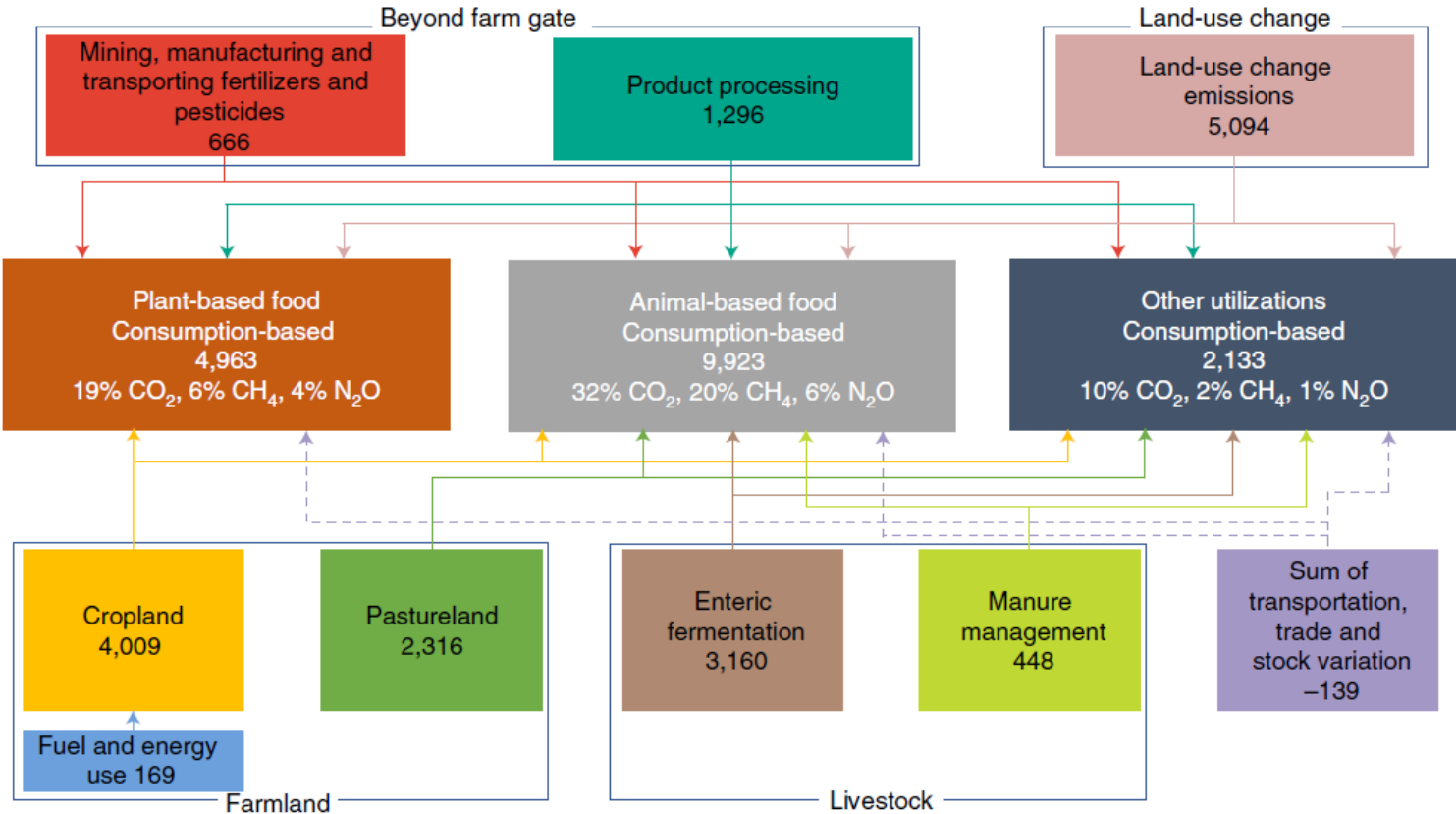
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**Fig. 2 | Total GHG emissions and food-system data globally, and in developing and industrialized countries. a,b** Fraction of food to total GHG emissions (a) and total GHG emissions from the food system (b) globally, in developing and industrialized countries. Non-CO<sub>2</sub> GHG emissions (CH<sub>4</sub>, N<sub>2</sub>O and F-gases) are expressed as CO<sub>2</sub> equivalent (CO<sub>2</sub>e) calculated using the GWP100 values used in the IPCC AR5, with a value of 28 for CH<sub>4</sub> and 265 for N<sub>2</sub>O.

# Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods

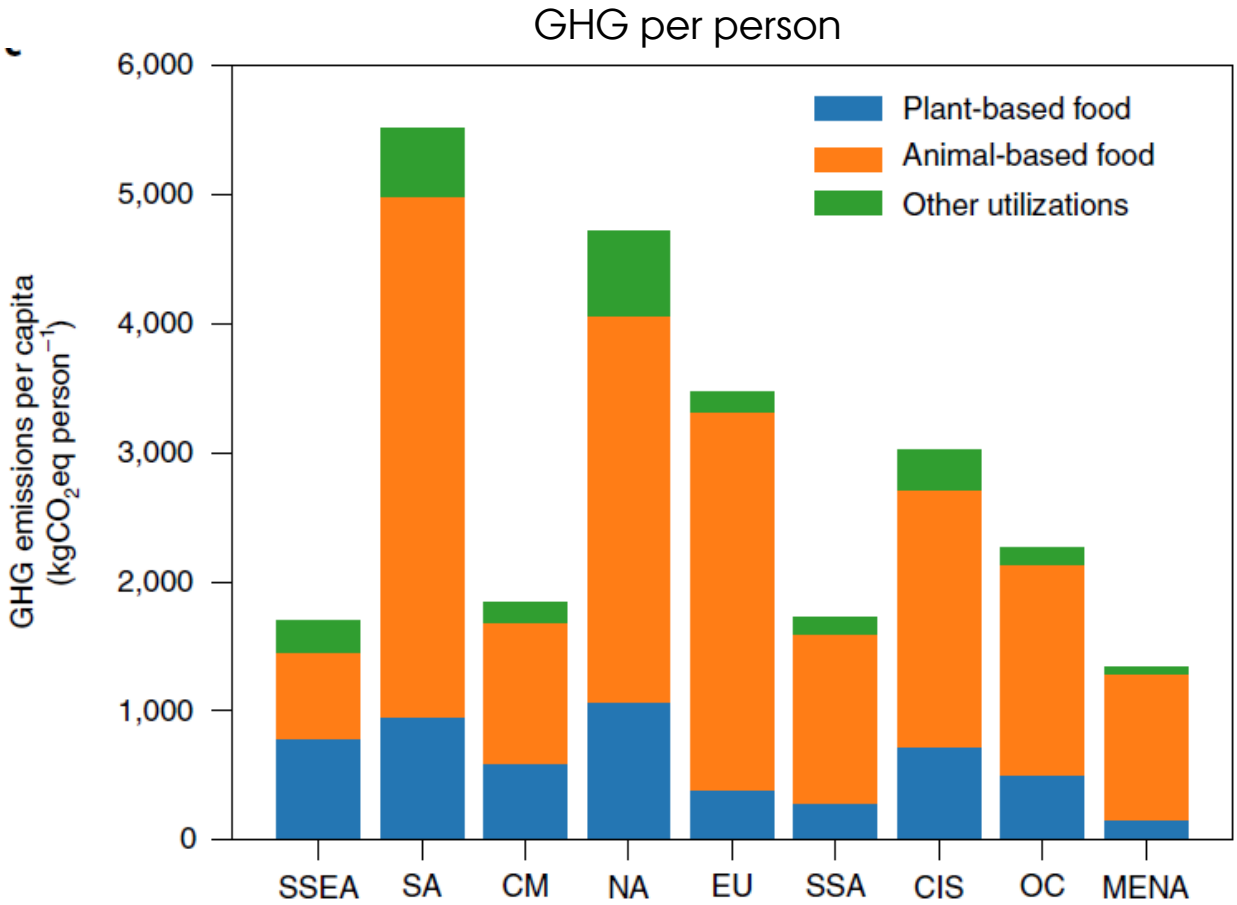
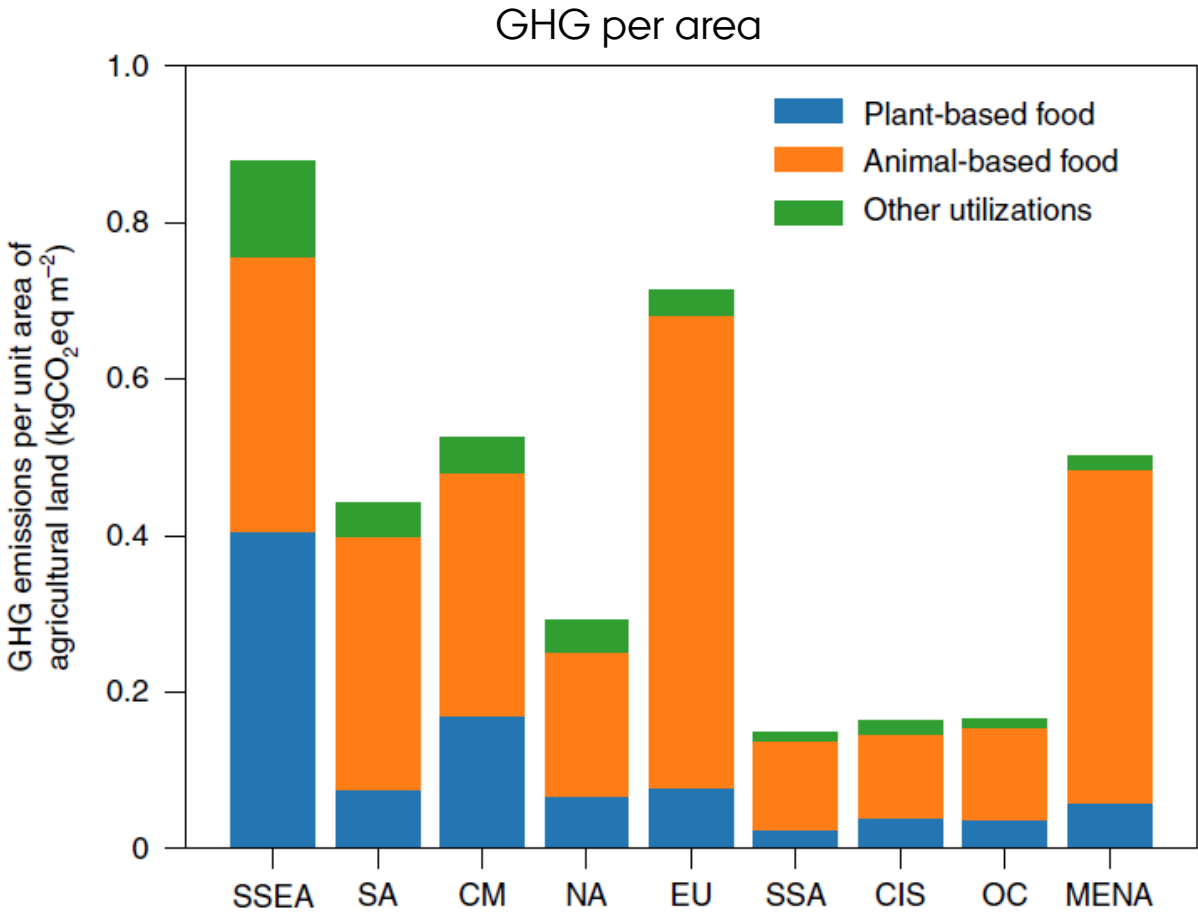
Xiaoming Xu<sup>1</sup>, Prateek Sharma<sup>1</sup>, Shijie Shu<sup>1</sup>, Tzu-Shun Lin<sup>1</sup>, Philippe Ciais<sup>2</sup>,  
Francesco N. Tubiello<sup>3</sup>, Pete Smith<sup>4</sup>, Nelson Campbell<sup>5</sup> and Atul K. Jain<sup>1</sup>✉



**Fig. 1 | GHG emissions from different subsectors of plant- and animal-based food production/consumption.** The contributions of individual GHGs provided are the percentage of the total emissions. Solid arrows indicate production-based emissions, and solid and dashed arrows combined are consumption-based emissions. The values in the boxes are mean values for 2007–2013, which may slightly differ from the median values of 10,000 Monte Carlo simulations in the text. Values are expressed in TgCO<sub>2</sub>eq.

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NA, North America; SA, South America; EU, European Union; MENA, Middle East and North Africa; SSA, sub-Saharan Africa; CIS, Commonwealth of Independent States; CM, China and Mongolia; SSEA, South and Southeast Asia; OC, Oceania and other East Asia



# Food system changes are required to constrain climate change

- Food systems currently contribute one-third to global warming
- Many different changes in both food demand, production and processing are required to meet targets

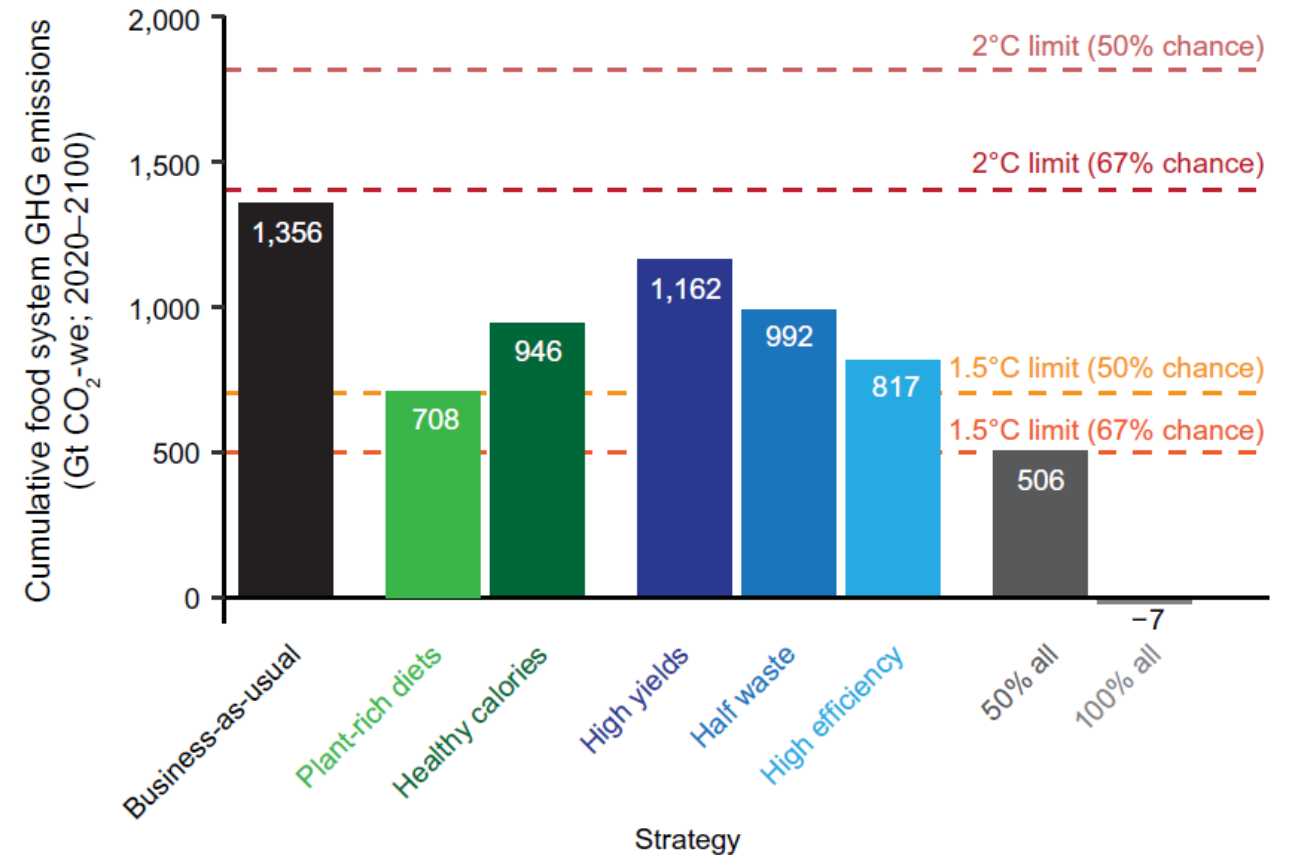


Fig. 1. Projected cumulative 2020 to 2100 GHG emissions solely from the global food system for business-as-usual emissions and for various food system changes that lead to emission reductions.

# Conference objectives

A forum to present novel technologies and management practices with a potential to reduce agricultural greenhouse gas emission, and to discuss and present this in the context of the overall policy targets.

The outcome will be improved understanding among scientists and end-users about how novel technologies and management of agricultural systems will affect emissions at farm and landscape scales.





# Conference themes

- Livestock
- Manure and fertilizers
- Mitigating GHG emissions in crop production systems
- Carbon storage in crop production systems
- Effect of land use on GHG emissions
- Monitoring, reporting and verification
- System analyses



# Practicalities – presenters

- Oral
  - Leave 5 minutes for discussion
- Flash talks
  - 2 minutes (2 slides max)
- Posters
  - Lounge area
  - Organized according to sessions
  - Poster prize (end of conference)



# Enjoy the conference

- Use breaks for networking and posters
- Conference dinner Tuesday
- The conference topics will be illustrated by Niels Roland and presented at the end of the conference
- Acknowledge funding by the Novo Nordisk Foundation





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