Needs

The agriculture sector, in particular livestock housing, contributes substantially to the emission of various greenhouse gases (GHG) within the EU including 93% of EU ammonia (NH_3), 48 % of Methane (CH_4) and 72% of nitrous oxide (N_2O) emissions. Further, emissions of NH_3 cause formation of fine aerosol particles, acidification and eutrophication of the environment and can be transformed to N_2O.

The EU Green Deal seeks to reduce GHG emissions for the agriculture by 55% of the 1990 level by 2030 and to reduce N losses by at least 50 %.

As a result, the uncertainties in emission inventories (up to 300%), in deposition of NH_3 release from livestock housing and in N_2O production processes in biogeochemical models all need to be reduced. Low-cost emission monitoring solutions such as sensors that are traceable and validated are required.

It is thus essential to develop a coordinated European metrology infrastructure to improve the NH_3 and GHG measurements and to reduce the uncertainties of emission data for a better understanding the emissions of GHG and reactive N in agriculture.

Project Organisation

WP1

Towards SI-traceable reference methods for livestock emissions factors

- Improved **wet ammonia reference gas**,
- **New comparisons directly in stables** (reduction of the uncertainties),
- **SI characterization, validation and comparison** of the sophisticated emission calculation methods and other simplified models,
- **Uncertainty assessment** of the methods and the emissions factors.

WP leader: METAS Federal Office of Metrology

WP2

New sensors and measurement techniques: development, laboratory testing and demonstration in the field

- Development and characterization of **new complementary sensors**,
- Two **field comparison** campaigns
- Precise **instruction for farmers** to use the new sensors

WP leader: KIT Karlsruher Institut für Technologie

WP3

Beyond livestock buildings: Reducing the uncertainties of N2O inventories and improving the quantification of NH3 deposition

- Determination of **NH_3 deposition** close to livestock housings,
- **Intercomparison of measurement techniques for determination of field NH_3 fluxes,**
- Determination of **N_2O source** processes in the field based on **isotope ratios in N_2O**,
- **Improvement of biogeochemical models** based on isotope measurements.

WP leader: VTT

WP4

Dissemination and communication

- **Contribution to missions inventory reports** under the UNFCCC,
- Provision of **guidelines** to facilitate the establishment of decision matrices mitigation measures by policy makers,
- Providing farmers access to **reliable methods** for identifying efficient mitigation strategies and provide quantitative GHG emissions at farm level.

WP leader: LGC

WP5

Management and coordination

WP leader: LABORATOIRE NATIONAL DE MÉTROLOGIE ET D'ESSAIS LNE

Contact details
Project coordinator: Axel Fouqueau (LNE) axel.fouqueau@lne.fr

Project objectives

Develop traceable techniques for quantifying NH_3 and CH_4 emissions from selected livestock housings

Develop and characterise CO_2, NH_3 and CH_4 monitoring techniques for enhanced spatial/temporal coverage

Identify key-indicators and improve emission models for increasing the representativeness of emission estimations.

To develop simple-to-use farm-monitoring systems and provide management tools to farmers

Reduce uncertainty associated with up-scaling GHG emissions and nitrogen loss from soils.

To improve methods for quantifying NH_3 deposition from livestock housing and tracing N in managed soils.

To facilitate the dissemination and uptake of the technology and measurement infrastructure

Consortium

LABORATOIRE NATIONAL DE MÉTROLOGIE ET D'ESSAIS – LNE

PTB

CZECH METROLOGY INSTITUTE

LGC

GASERA

Agroscope

VTT

Empa
Materials Science and Technology

IMT Nord Europe
École Mines-Télécom
IMT-Université de Lille

Luke
NATURAL RESOURCES INSTITUTE FINLAND

KIT
Karlsruher Institut für Technologie

Senseair

THÜNEN

WAGENINGEN
UNIVERSITY & RESEARCH

TNO

INRAE

METAS
Federal Office of Metrology

VSL

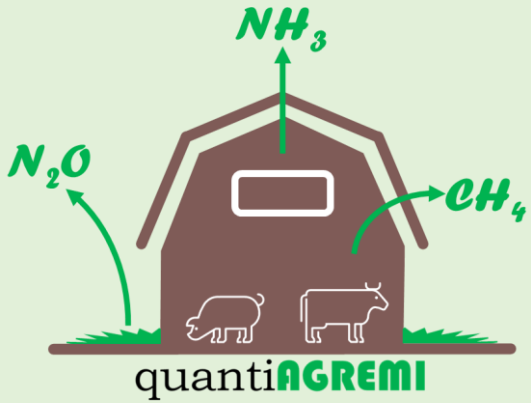
TÜBİTAK

VAISALA

UK Centre for Ecology & Hydrology

quantiAGREMI

On farm quantification of ammonia and greenhouse gas emissions from livestock production



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