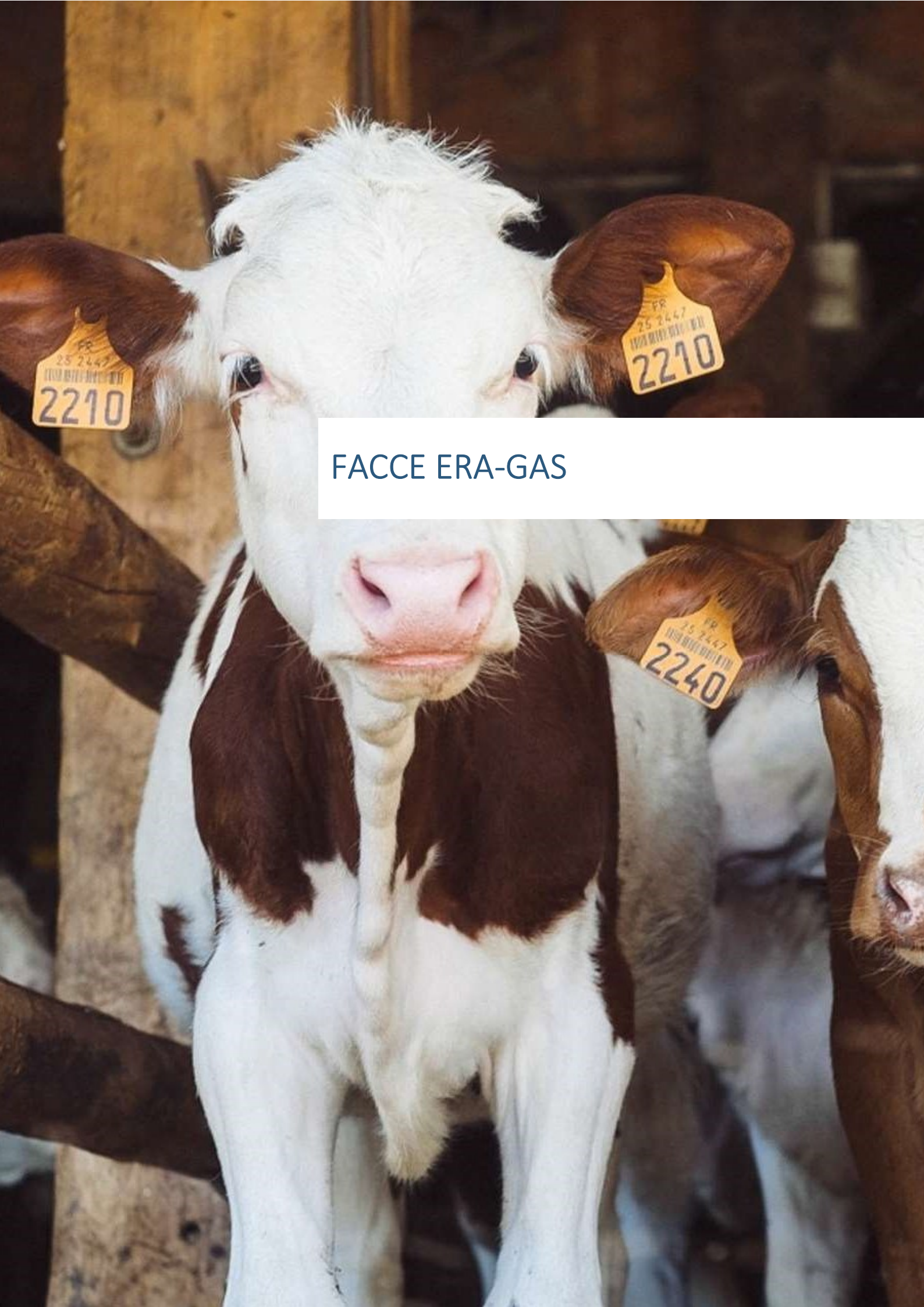

FACCE ERA-GAS

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Monitoring & Mitigation of Greenhouse Gases from Agri- and Silvi-Culture

About

FACCE ERA-GAS is the ERA-NET Cofund for monitoring and mitigation of greenhouse gases (GHGs) from agri- and silvi-culture. The ERA-NET consortium of FACCE ERA-GAS consists of 19 partner organisations from 13 countries.

Aim and objectives

The aim of FACCE ERA-GAS is to strengthen the transnational coordination of research programmes and provide added value to research and innovation on GHG mitigation in the European Research Area. ERA-GAS organises funding calls for transnational research projects that aim to develop enabling technologies and innovative solutions to improve GHG inventories, increase the GHG efficiency of food, feed and fuel production, enhance carbon sinks and develop circularity in agricultural systems. This is further reinforced by additional activities that support the work of the researchers and research projects (via training, workshops and webinars), and also contribute to better alignment and integration of national research programmes in the area, including internationally.

The expected impact of the ERA-NET Cofund is to provide solutions for the agricultural sector in Europe, which faces significant challenges in curbing GHG emissions while maintaining food security and sustainability in a changing climate. It also seeks to boost climate mitigation in the forestry sector. This transnational effort is urgently required to mitigate climate change, refine GHG reporting mechanisms and design policy instruments necessary to tackle this global environmental challenge.

A key priority of the FACCE ERA-GAS consortium is to ensure that the ERA-NET's activities help to achieve the FACCE–JPI Strategic Research Agenda (SRA) and FACCE–JPI objectives, notably those concerning the agricultural and forestry GHG monitoring and mitigation at present and in the future.

The specific objectives of this ERA-NET are to:

- Design, coordinate and implement a joint co-funded call between Member States/Associated Countries, international third countries and the European Commission aimed at improved monitoring and mitigation of agricultural and forestry GHGs
- Enhance research and innovation capacity in the area of GHG mitigation by promoting cooperation and coordination across nations
- Establish new networking structures and reinforce existing partnerships and initiatives focussed on GHG mitigation in the AFOLU (Agriculture, Forestry and Land Use) sector
- Reduce fragmentation and duplication of research activities and identify international best practices
- Develop enabling technologies and innovative solutions to improve inventories, increase the GHG efficiency of food, feed and fuel production and enhance carbon sinks

Promote the systematic exchange of knowledge between multidisciplinary research and innovation actors and increase engagement with stakeholder communities.

Challenges

Underpinning the ERA-GAS research agenda are the challenges arising from European climate and land management policies and associated GHG emission targets. In 2015, when the proposal for ERA-GAS was written, the 2030 policy proposals required a 40% reduction in emissions, while primary production was to remain steady or even increase output. In 2019, the European Parliament declared a global "climate and environmental emergency" and the new European Commission President, Ursula von der Leyen, committed to leading the fight against the existential threat posed by climate change. The new Commission set as its headline ambition to become the world's first climate-neutral continent by 2050 and followed with a suite of proposals to meet this objective under the European Green Deal.

The European Climate Law from 2021 writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels. Climate neutrality by 2050 means achieving net zero GHG emissions for EU countries as a whole, mainly by cutting emissions, investing in green technologies and protecting the natural environment.

Within this renewed political context, the importance of land-based primary production systems in achieving core European policy objectives has never been so high. According to a study conducted by the European Commission's Joint Research Centre, food systems are responsible for a third of global anthropogenic GHG emissions, with over 70% of these emissions arising from agriculture and land use/land-use change activities. Agriculture therefore represents a pivotal sector for implementing GHG emission reduction and carbon storage measures. Forestry remains a crucial component of EU climate, energy, bioeconomy and environmental policy and carries a weight of expectation to provide critical carbon sequestration and carbon removals (e.g. storage in long-lived wood products) in order for climate-neutrality to be achieved. Furthermore, sustainable land management can contribute to reducing the negative impacts of multiple stressors, including climate change, on ecosystems and societies.

Scope, goals and research topics

ERA-GAS covers monitoring and mitigation of GHGs from agriculture and silviculture, including such aspects as reducing uncertainties and improving national GHG inventories, the role of climatic variability and agricultural and forestry practices in regulating GHG emissions, the technical and economic potential of methane and nitrous oxide mitigation options, carbon sequestration and economic and policy measures, including barriers to implementation.

The original scope of ERA-GAS at the start of the network included four main research themes:

1. Improving national GHG inventories and monitoring, reporting and verification of emissions
2. Refining and facilitating the implementation of GHG mitigation technologies
3. State-of-the-art production systems that are profitable and improve food and forest biomass production while reducing GHG emissions
4. Assessment of policy and economic measures to support emissions reductions across the farm-to-fork and forest-to-consumer chain

The 2020 FACCE-JPI SRA provides the framework for further developing the ERA-GAS strategy on agricultural and forestry GHG monitoring and mitigation. The work of ERA-GAS contributes especially to Core Theme 1 "An agricultural sector that contributes to climate neutrality". The Key Areas in Core Theme 1 "An agricultural sector that contributes to climate neutrality" cover the following:

KA1. Carbon-neutrality of sustainable food systems
KA2. Deployment of carbon farming solutions
KA3. Reducing carbon footprints through circular biomass chains
KA4. Strategies to reduce GHG emissions based on improving understanding of the microbiome of soils and animals
KA5. Optimising carbon neutrality through digital technologies
KA6. Protection and enhancement of landscape carbon stocks

KA 1, 3, 4 and 5 have been addressed comprehensively by ERA-GAS in recent years. The focus in these areas should therefore be on continuing critical work and aligning with and informing other relevant on-going or planned initiatives. KA 2 and 6 were addressed by the first call in 2016 and are important components of both the European Joint Programme on Agricultural Soil Management (EJP Soil) and the EU Mission 'A Soil Deal for Europe'. A cross-cutting issue deserving attention is the multi-functionality of land-based systems. A more holistic view of sustainable land management is needed to see the linkages between climate regulation and other land functions, as well as across land uses. Another critical cross-cutting issue is addressing trade-offs and co-benefits, as highlighted by Core Theme 4 of the FACCE-JPI SRA 2020 (Trade-offs and synergies between food production, ecosystems and climate). Achieving climate objectives should not have major detrimental impacts for food and nutrition security or for ecosystems. Therefore, solutions for agriculture and forestry production systems that maximise their contribution to multiple policy objectives, such as creating co-benefits for both climate and biodiversity, could be supported through Member State actions. Continued global cooperation and leadership in the area of GHG mitigation and monitoring is also of paramount importance in addressing such an immense shared challenge.

Some important 'game changers' (actors, technologies, trends, events) were identified under Core Theme 1, which could also have relevance to the scope of ERA-GAS:

- Functional biodiversity to sustain high productivity, low external inputs and carbon neutrality
- Manipulation of microbial functions to reduce the level of GHG emissions
- Digital technologies that substantially improve the capacity of monitoring and predicting the behaviour of agricultural systems and provide a foundation for financially rewarding net emission reductions.
- Societal push for less livestock products;
- Bio-refining technologies that reduce waste, save energy and enhance carbon retention of soils
- Co-development and demonstration of technologies and production systems to enhance implementation of carbon-neutral practices by farmers.