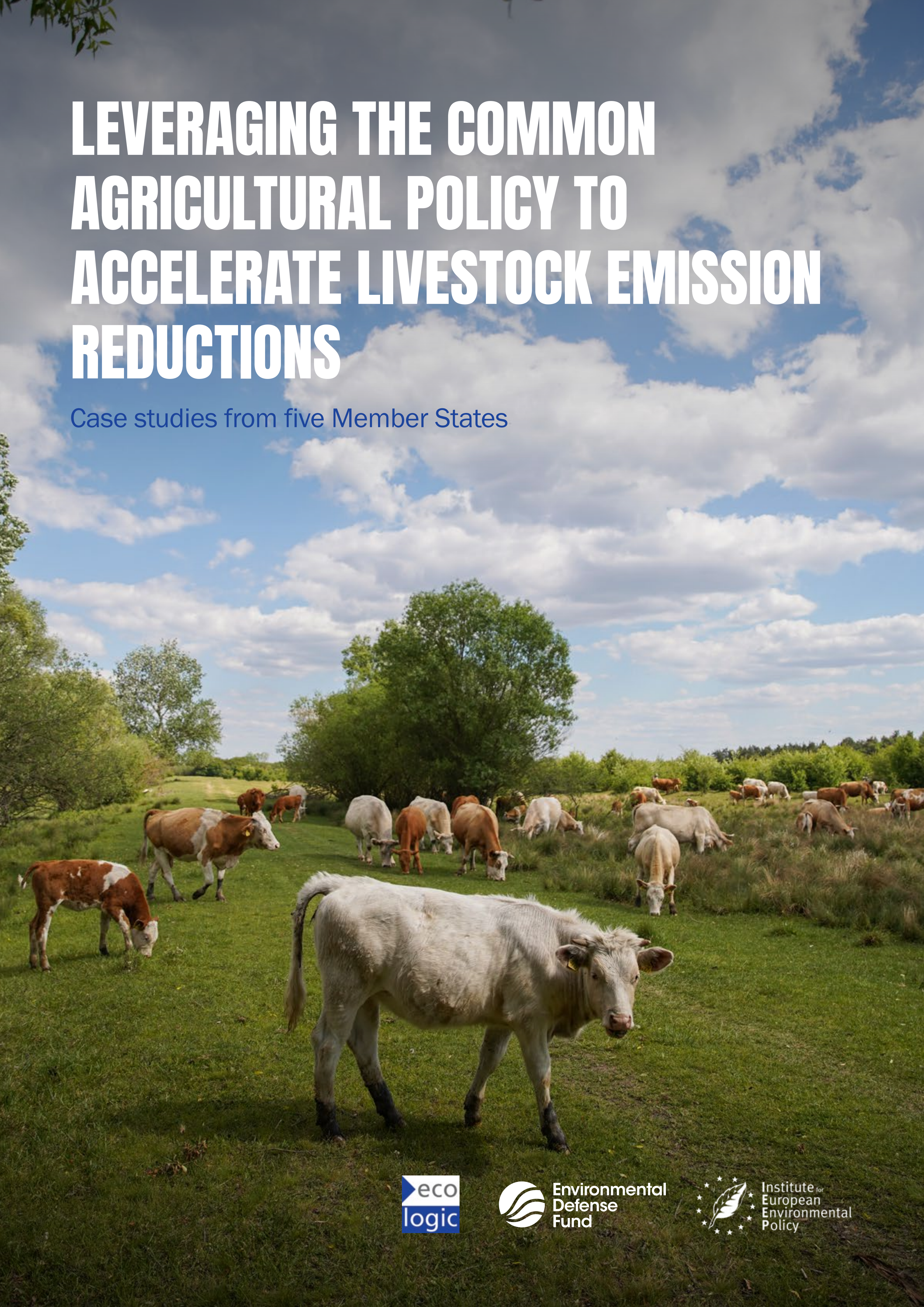
LEVERAGING THE COMMON AGRICULTURAL POLICY TO ACCELERATE LIVESTOCK EMISSION REDUCTIONS

Case studies from five Member States



eco logic

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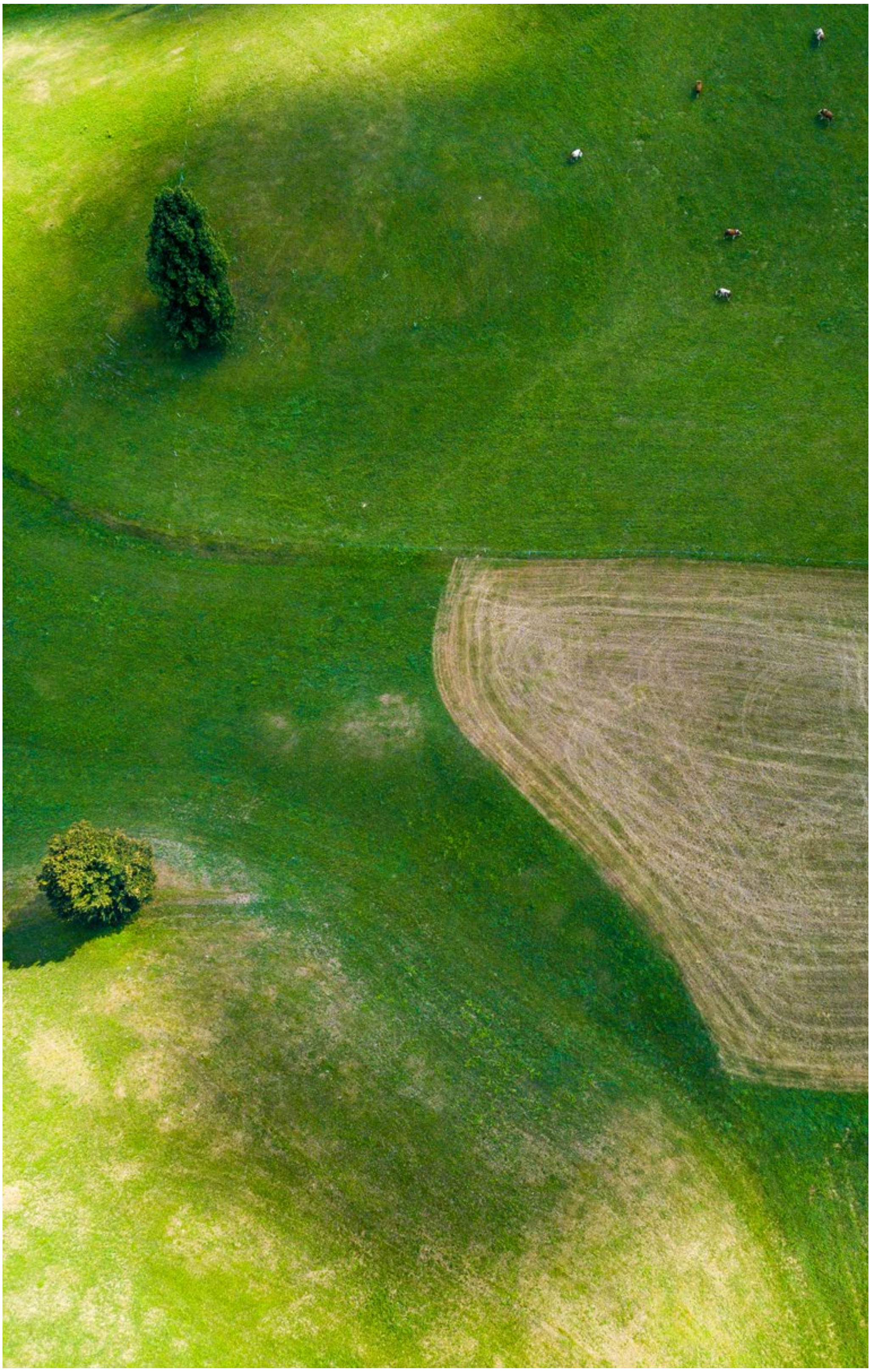
TABLE OF CONTENTS



EXECUTIVE SUMMARY

Livestock production is responsible for around 65% of the European Union's agricultural greenhouse gas (GHG) emissions, with methane from enteric fermentation and methane and nitrous oxide from manure management representing the primary sources. Despite the range of mitigation options available, emission reductions in this sector remain limited to date. Projections suggest that agriculture may become the EU's largest emitting sector by 2040. The Common Agricultural Policy (CAP), the EU's key agricultural policy instrument, holds significant untapped potential to support emission reductions in livestock. However, current implementation of the 2023–2027 CAP Strategic Plans across Member States shows limited ambition and insufficient targeting of support and action on livestock-related emissions.

This report analyses the extent to which Member States are leveraging the CAP via their CAP Strategic Plans (CSPs) to reduce emissions from the livestock sector focusing on ruminants. It assesses interventions that have the potential to contribute to emission reductions, examines barriers to their uptake, and identifies opportunities for improving the CAP's effectiveness in delivering emission reductions from livestock, focusing on five Member States: Belgium (Flanders), France, Hungary, Poland, and Spain.

The livestock sectors in the five Member States vary considerably in size, structure, and emission intensity. France has the largest cattle herd, while Hungary and Poland have smaller sectors but higher emissions per head of livestock. In Belgium-Flanders, livestock densities are among the highest in the EU, driven by intensive animal farming systems, while Spain and Hungary maintain more extensive systems in certain regions. In all countries, the number of livestock farms has declined, with a growing concentration in larger farm holdings. The diversity across Member States and the structural changes taking place highlight the importance of tailored, region-specific approaches to emission reductions in livestock systems.

A wide range of technological and on-farm management options is available to reduce direct emissions from livestock. These include feed additives, improved manure storage and management systems, anaerobic digestion, low-emission housing, and genetic improvements. Collectively, modelling suggests that such interventions could reduce emissions from livestock systems by around 25%, leaving 75% not addressed. These would require demand-side changes such as dietary shifts combined with the reduction of livestock numbers and food waste reduction. These aspects, however, fall outside the scope of the current CAP.

While the CAP provides funding through interventions such as eco-schemes, agri-environment-climate measures (AECMs), investment support, and coupled income support (CIS), their use in directly targeting livestock emissions has been limited. Of the 51 relevant interventions identified across the five countries, only four were identified as having the potential to have a direct positive impact on emissions, with 25 having the potential to contribute indirectly, and 12 CIS interventions having a potential negative

impact by providing direct support to livestock without requiring any mitigation of emissions. Budget allocations further reflect this imbalance with more than €9 billion allocated to coupled support for livestock, compared to less than €3 billion for interventions with potential mitigation benefits.

Among the few interventions with the potential to have a direct positive impact on emissions, some show promise but face significant implementation challenges. In Belgium-Flanders, an eco-scheme supports methane-reducing feed additives for cattle, in collaboration with up- and downstream value-chain actors sharing the financial burden. Nevertheless, uptake remains low due to inadequate financial coverage, bureaucratic complexity, and lack of buy-in from the private sector. In Hungary, investment support is available for upgrading manure management systems. Though strategically targeted, the programme has reached only a small number of farms and has been slowed by implementation delays. In Spain, regional investment support includes a wide array of low-emission infrastructure upgrades, such as feed mixing systems and manure treatment technologies, but uptake and funding vary substantially by region.

All five Member States have adopted interventions with a potential indirect link to livestock emissions. Spain seeks to prioritise extensive livestock systems through regional investment and support measures, often linked to stocking density controls and agroecological objectives. France focuses on broader farm-level climate assessments using carbon balance tools and relies partly on private sector initiatives to incentivise mitigation. One particularly innovative approach is France's "Transition of Practices" scheme, which provides substantial payments to farmers based on actual emission reductions. Despite its potential, participation has fallen short due to concerns about administrative complexity, financial risk, and the perception that support is insufficient to compensate for implementation costs.

National managing authorities face a number of persistent challenges in translating livestock mitigation opportunities into CAP interventions. These include varying and context-dependent mitigation potentials, difficulties in designing interventions that meet both CAP requirements and scientific criteria and a lack of coordination between different national managing authorities. Moreover, Member States often lack the necessary data to quantify the expected mitigation impacts of interventions, which limits their ability to prioritise and evaluate climate-relevant measures.

Farmers and land managers face several challenges to implement livestock emission reduction measures. These include economic viability and financial security associated with the upfront investment and additional running costs, a lack of trusted and accessible advisory services, and limited access to co-financing or private investment. In addition, agronomic capacity and limited awareness of available mitigation strategies among farmers can hinder the implementation of low-emission practices. Farmers' ability to invest in climate mitigation is constrained by their economic dependence on powerful supply chain actors who limit their financial autonomy and bargaining power. Competing regulatory demands and tight profit margins further restrict their capacity to adopt sustainable practices.

The report offers ten recommendations to steer the ruminant livestock sector towards lower emissions. Member States should exploit the on-farm mitigation potential currently available through their CSPs, setting out a clear intervention logic. Coupled income support should be redirected towards more targeted interventions or be made conditional on low-emission practices. Furthermore, attractive business opportunities should be developed through public–private partnerships that incentivise livestock emission reduction actions. The report highlights the need for better support from EU institutions to help Member States assess mitigation potentials and design effective interventions. Improving knowledge infrastructure is essential. Advisory services, training, and demonstration projects should be strengthened to build farmers' capacity and trust. Tools used to assess farm-level emissions should be simple, transparent, and suitable for both advisory and payment purposes. Stronger coordination across government departments is also necessary. Better integration of CAP interventions with other climate and environmental policies, would improve coherence and impact.

The EU's livestock sector has the potential to make a significant contribution to achieve climate neutrality in 2050. However, to do so will require a significant change in approach by Member States to focus on reducing emissions from livestock. This requires a broad set of measures, including financial incentives and business opportunities for farmers and the value chain, coherent climate policies, context-specific solutions and strengthened knowledge infrastructure for both managing authorities and farmers.

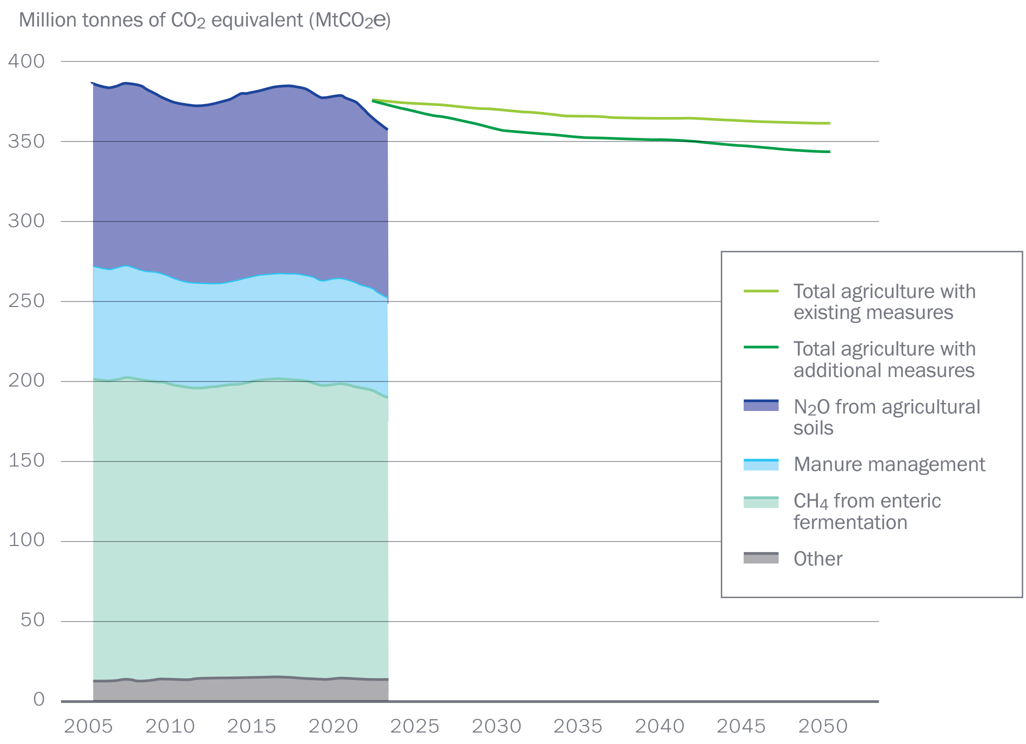
CHAPTER 1

INTRODUCTION

The agricultural sector accounts for 12.3% of EU emissions in 2023[1]. Of the sector's GHG emissions, livestock production accounts for a two-thirds (65%) (*also see Figure 1*): methane emissions (CH_4) from enteric fermentation are responsible for 49% of total agricultural emissions while methane and nitrous oxide (N_2O) emissions from manure management account for 17% (EEA 2024). The scenarios presented in the European Commission's 2024 impact assessment project that by 2040, agricultural emissions could account for between 33% and 76% of total greenhouse gas emissions (EC 2024), making agriculture become the sector with the highest GHG emissions in the future.

FIGURE 1:

EU agricultural emissions by source and projected emissions
(Source: EEA 2024)



Indirectly, the production of livestock relies on feedstuff production and significant levels of energy use, leading to indirect GHG emissions, especially from land use changes and fertiliser use in the context of the production of protein feed. Due to the complexity of the processes, drivers and sectors involved, indirect emissions are difficult to quantify.

It is clear that an acceleration in efforts to reduce agricultural emissions is required if the existing 2030 and 2050 as well as the proposed 2040 targets for climate are to be met, particularly since non-CO_2 emissions from agriculture have remained relatively stable between 2005-2021[2], compared to reductions in most other sectors (apart from buildings) that fall under the Effort Sharing Regulation (European Commission, 2023a). Based on the European Commission's own assessment, information provided by Member States in their National Environmental and Climate Plans (NECPs) has shown that emissions covered by the Effort Sharing Regulation, which includes agriculture, are expected to decrease by 38% in 2030 compared to 2005 levels, which is about two per cent short of the EU target of 40% (European Commission, 2025). There is a range of mitigation options that exist to reduce methane and nitrous oxide emissions from livestock in a cost-efficient way and estimates show that these could lead to a reduction of around 25% in livestock emissions (Pérez Domínguez et al. 2020). However, challenges remain since this leaves a residual of 75% of emissions from the livestock sector, To achieve further reductions requires demand side actions, combined with the reduction of livestock numbers and food waste reduction.

The Common Agricultural Policy (CAP) is one of the European Union's largest spending programmes and has significant potential to support the reduction of GHG emissions from livestock. The current CAP (2023-2027) includes a variety of funding mechanisms that can be used to incentivise the adoption of more environmentally- and climate-friendly practices in both CAP funds, through activities funded under eco-schemes, agri-environment-climate schemes and investments *inter alia*. However, despite these opportunities to incentivise the reduction of livestock emissions through CAP interventions, the CAP also includes support that is directly focused on supporting the maintenance of livestock numbers, for example through coupled income support. Overall, the recent study by the European Commission (2025b), highlights that the potential contribution of all CSPs to GHG emission reductions relating to enteric fermentation and manure management was estimated to be negligible. This raises questions about the CAP's long-term role in reducing emissions from agriculture and transforming farming systems (see for example, Kortleve et al., 2024).

Negotiations on the architecture and design of the CAP for the upcoming funding period from 2028 to 2035 are set to commence later in 2025. The CAP's design for this period will play a crucial role in determining its impact on achieving the 2040 climate target (Scheffler and Wiegmann, 2024). It is therefore timely to examine how the CAP funds in the current programming period are being implemented to either facilitate and/or disincentivise the reduction of livestock emissions.

The purpose of this report, therefore, is to determine the types and nature of the CAP interventions that Member States have put in place to support actions to accelerate the reduction of livestock emissions, with a focus on ruminants. It focuses on the approach taken in five Member States: Belgium-Flanders, France, Hungary, Poland and Spain, providing detailed examples of the interventions identified. These Member States have been chosen to illustrate different approaches in various geographical regions. The report also outlines the challenges faced by Member State authorities in putting in place these types of measures and the barriers faced by farmers in adopting them.

By focussing on the positive action being taken in Member States, the findings are intended to provide insights into the potential for the types of actions that could be funded via the CAP in the future as well as informing discussions on the role for additional policy or private financing beyond CAP support, given the necessary increase in climate ambition for the agricultural sector towards meeting the EU's 2040 climate target.

CHAPTER 2

METHODOLOGICAL APPROACH

The analysis in this report is drawn from a combination of a desk-based review of available data and literature, combined with targeted interviews with the authorities and advisory services in each of the five Member States that are a focus of the study. Details of the methods and data sources utilised are set out below.

Data to provide the **contextual information on the livestock sector** in the five Member States investigated was collated using a series of fiches developed for this purpose. These covered seven themes:

1. Number of livestock farms by NUTS2 region
2. Livestock population by NUTS2 region
3. Livestock density by NUTS2 region
4. Distribution of farms (% farms) by livestock size class in 2020
5. Socio-economic situation of the livestock sector
6. Economic situation of the sector
7. Historic and predicted emissions from the livestock sector (enteric fermentation and manure management)

The data sources used were those providing standardised EU data to allow for comparisons to be made between countries (*see Chapter 3*).

To identify the **CAP interventions** that had the potential to reduce livestock emissions in the five Member States, data was sourced from the European Commission's Catalogue of CAP Interventions[3]. For the eco-scheme, agri-environment-climate and investment interventions, the farm practice labels[4] relevant for livestock were applied, to create a long list of possible interventions (*see Box 1*). For Coupled Income Support, all interventions that were focused on livestock, as well as protein crops were selected. This led to a long list of 60 interventions with a potential to have an impact on livestock emissions (*see Annex 1*).

All relevant information on these interventions were downloaded, including the intervention description, eligibility criteria, planned budget (total public expenditure), the targets identified for planned uptake of the interventions (output indicators) and the CAP plan version.

BOX 1:

Farm practice labels used to identify the CAP interventions with a link to livestock

The classification scheme developed by the Joint Research Centre (JRC) categorizes farming practices into three tiers based on their level of detail and environmental impact:

- **Tier 1:** Contains 45 classes, providing a broad categorization of farm practices
- **Tier 2:** Contains 164 classes, offering more detailed classifications
- **Tier 3:** Contains 157 classes, with the highest level of specificity

To work effectively with this classification, we combined the different tiers, creating unique chains of agricultural practices that could be assessed without being limited to a single tier. Based on expert criteria from members of the EDF, Ecologic Institute and IEEP, farming practices most relevant to livestock emissions were identified. These practices were rated according to their potential impact on livestock-related emissions, to allow for targeted analysis as follows:

- **0** - no livestock emission impact
- **1** - indirect livestock emission impact
- **2** - direct livestock emission impact

46 farm practice labels were identified as having a potential direct impact on livestock emissions, drawn from the following classification sections: FX – Fertilisation and soil amendments; MX – Manure management; GX – Grassland and grazing; AX – Animals; WX – Water; BX – Bioeconomy, energy efficiency and production; DX – Assessment and management plans.

36 farm practice labels were identified as having a potential indirect impact on livestock emissions, drawn from the same classification sections as for the direct potential impact, as well as the following: ZX (specifically Z22 on the conservation of rare/local livestock breeds); EX – precision agriculture; OX – Organic Farming; LX – low input systems; and TX – Training.

In a second phase, further categorisation was carried out on the long list of 60 interventions identified during the first phase, based on a review of the intervention descriptions and eligibility criteria to create a short list of relevant interventions. Three categories were agreed as follows:

1. Direct impact on livestock emissions – interventions which directly relates to livestock and has the potential to influence methane or nitrous oxide emissions. This category was further broken down into:
    a. Positive direct impact – potential to lead to a decrease in emissions
    b. Negative direct impact – potential to lead to an increase in emissions
    c. No significant impact – no significant impact anticipated

2. Indirect impact on livestock emissions – interventions in which the focus is not the reduction of emissions related to livestock, but nevertheless, elements of the requirement could lead indirectly to GHG emission reductions (including CO_2 emissions) linked to livestock systems based on expert judgement. The sorts of practices identified under this category include:
    a. support for extensification or extensive grazing systems, combined with limits on the number of grazing livestock
    b. the promotion of protein crop production for feed to increase protein autonomy and reduce imports from abroad and therefore potentially reduce the sectors' global footprint
    c. the use of manure instead of chemical fertilisers
    d. the use of more agro-ecological practices
    e. improvements in animal welfare to reduce the number of unproductive animals.

3. Irrelevant – those interventions that, when reviewed in detail, had no link to livestock systems or livestock emissions.

Through this process, nine interventions were excluded from the analysis, leaving the list with 51 interventions, categorised as shown in Table 1.

TABLE 1:

Overview of the categorisation of identified interventions

	Eco-schemes	Agri-environment-climate (ENVCLIM)	Investments (INVEST)	Coupled Income Support (CIS)	Total
Direct – Positive	2	-	2	-	4
Direct – Negative	-	-		12	12
Direct – not significant				10	10
Indirect	4	14	1	6	25
Totals	6	14	3	28	51

Of the interventions identified and categorised, four were chosen to be **investigated in-depth**, including three with the potential to have a direct positive impact (in Belgium-Flanders, Hungary and Spain) and one with a potential indirect impact (France). This in-depth assessment was based on the information available within the CAP Strategic Plans, complemented by information derived from national scheme documentation and information extracted from semi-structured interviews (see below).

A **rapid literature review** was undertaken to provide a framework for understanding the barriers and enablers linked to the CAP and the livestock emissions, particularly from the perspective of national managing authorities and farm advisors in each of the five analysed countries and at European level. The review focused on peer-reviewed journal articles, policy reports, grey literature, and relevant databases published between 2015 and 2025. We identified sources through systematic keyword searches using Google and Google Scholar. Additionally, we applied the snowball method to identify further relevant sources by examining the reference lists of key articles and reports. This iterative process allowed us to build a more in-depth compilation of relevant literature. The keywords used were: CAP, Livestock, animal husbandry, GHG emissions, farmer uptake, beef farmers, dairy farmers, farm advisors, barriers, challenges, enablers, success factors, Common Agricultural Policy, risks, cattle, methane, CH_4, livestock emissions, success, animal, animal management, livestock farmer, society, social, Belgium-Flanders, France, Hungary, Poland, Spain, EU, Europe.

Semi-structured interviews were also carried out with stakeholders directly involved in CAP implementation, including national managing authorities responsible for CAP farming measures and farm advisors with direct experience in livestock systems in each of the five Member States. The focus of these interviews was to explore further the barriers and enablers identified in the literature review as well as to source information about the implementation of the schemes identified for the in-depth analysis (see above). The interviews focused on four main areas, with the questions shared in advance with the interviewees: 1) understanding livestock related CAP measures at the Member State level, especially for cattle, dairy, and small ruminants, 2) identifying possible additional relevant measures not included in our previous CAP categorisation, 3) evaluating the environmental impact of these measures, particularly on GHG emissions, and 4) identifying key barriers and enablers for developing and implementing these measures. Each interview lasted approximately 45–60 minutes and was conducted online. Eight interviews were conducted with a total of four individuals working in (or previously working in) Managing Authorities and seven farm advisors as follows:

- Belgium- Flanders: one interview - managing authority and two farm advisors
- France: two interviews - three farm advisors.
- Hungary: two interviews - managing authority and farm advisor.
- Poland: one interview - managing authority.
- Spain, two interviews – ex managing authority (now working as an academic) and farm advisor

Finally, the recommendations were tested with national experts on land use and climate issues, using the Think Sustainable Europe network of Think Tanks.

CHAPTER 3

CHARACTERISTICS OF THE LIVESTOCK SECTOR IN THE FIVE MEMBER STATES

In Europe, the importance of livestock farming varies greatly between Member States, their regions and livestock types. In this chapter we describe the livestock patterns[5], the impact on the climate and the socio-economic and economic situation of the sector in the five Member States Belgium-Flanders[6], France, Hungary, Poland and Spain. The analysis is based on the following key indicators:

- Livestock patterns: Number of livestock farms, its distribution by livestock size class, livestock population and its density,
- Impact on climate: GHG emissions from the livestock sector
- Socio-economic situation: Number of people working in the agricultural sector and the age structure of farm managers
- Economic situation: Value of agricultural output

The characteristics of the livestock sector in the five Member States are important to understand the approaches taken by the respective Member States through the national strategic plans.

3.1 Livestock patterns

3.1.1 Number of livestock farms and its distribution by livestock size class

Farms in the EU are numerous and diverse, varying in size, the types of crops grown or animals raised, management structures, and their locations across regions with different geologies, landscapes, and climates.

In 2020, the EU had 4.1 million agricultural holdings with livestock, representing 44.9% of the total 9.1 million farms (Eurostat 2023a). Generally, specialist livestock farms[7] are more prevalent in northwest Europe (Eurostat 2022a). The concentration of livestock farms varies greatly between Member States and its regions. For example, out of its eight regions Hungary’s livestock farming is most concentrated in Észak-Alföld and Dél-Alföld, which have both the highest number of ruminants (25,5% and 29,1%) and the highest share of holdings with livestock units in total (Eurostat 2024a). Among the five case study countries Belgium has the highest share of farm holdings with livestock (60.7%), followed by France, Hungary, Poland, and Spain (*see Figure 2*).

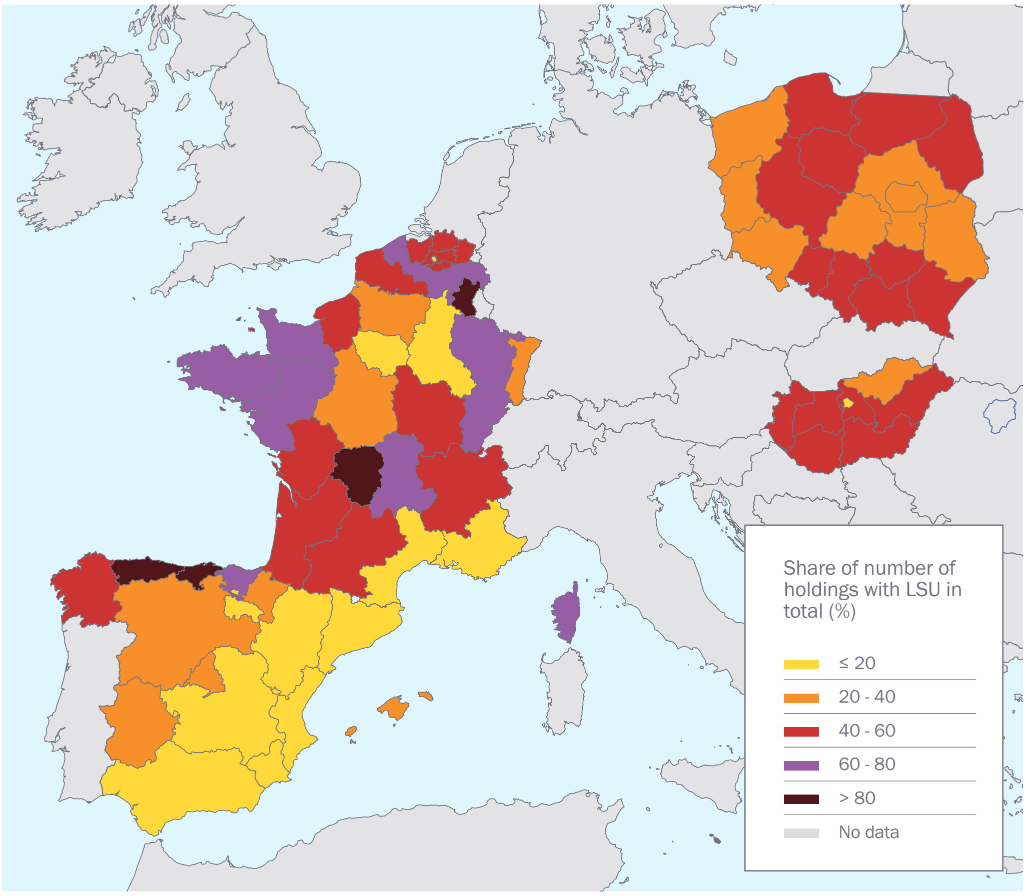
Between 2010 and 2020 there was a significant decline of 2.6 million livestock farms (or 39.3%) and the rate of decline in farms with livestock was faster than the rate for all farms as a whole in most EU countries. Among the five case study countries, Hungary experienced the sharpest decline of livestock farms by -70.6% (Eurostat 2023b). This indicates that the livestock sector is highly vulnerable to internal and external conditions and trends (e.g.

land use change, competitiveness, shift in dietary patterns). While the number of farms in the EU has been in steep decline, the amount of land used for production has remained steady, which indicates that the size of the farms increased (Eurostat 2022).

FIGURE 2:

Share of number of holdings with LSU in total, 2020

(Source: Eurostat 2020)



In 2020, approximately 93% of farms in the EU were classified as family farms, meaning that at least 50% of the agricultural labour on these farms was carried out by family members. This indicates that most of the EU's farms are small in nature[8] (Eurostat 2024).

The distribution of farms (% farms) by livestock size class in 2020 varies greatly across Member States. Among the five case study countries, farms with a livestock class between 100 and 499.9 LSU were the most common in Belgium and France, accounting for above 30% of all farms. In Poland, Hungary and Spain Farms with a livestock class between 0 and 5 LSU were the most common. In Hungary these farms are by far the majority with around 85% (*see Table 2*).

TABLE 2:

Distribution of farms (% farms) by livestock size class in 2020 split by the five Member States

(Source: European Commission 2020)

Livestock size class	Belgium-Flanders	France	Hungary	Poland	Spain
Over 0 to less than 5 LSU	9%	13%	85%	61%	29%
From 5 to 9.9 LSU	6%	7%	5%	11%	10%
From 10 to 14.9 LSU	4%	5%	2%	7%	6%
From 15 to 19.9 LSU	4%	4%	1%	4%	5%
From 20 to 49.9 LSU	15%	17%	3%	11%	18%
From 50 to 99.9 LSU	18%	21%	1%	4%	12%
From 100 to 499.9 LSU	38%	31%	1%	2%	15%
500 LSU or over	7%	2%	1%	0%	4%

3.1.2 **Livestock population and density**

In 2023, there were 74 million head of bovine animals and 68 million head of sheep and goats. A majority of the EU's livestock is held in just a few of the Member States. Among the five case study countries, France has the highest share of bovine animals with around 22% of the total population in the EU (Eurostat 2024c). Table 3 gives an overview of the livestock population split between dairy, non-dairy and small ruminants in 2024 for the five Member States.

During the past two decades, livestock population have shrunk across the EU, with bovine numbers decreasing approximately 9% between 2002 and 2022 (*see Figure 3*).

TABLE 3:

Total livestock population split between dairy, non-dairy and small ruminants (in thousand heads) in 2024 for the five case study countries

(Source: Eurostat 2025)

	2024			
Region	Dairy cows (A2300F)	Non-dairy cows (A2300G)	Live sheep (A4100)	Live goat (A4200)
Belgium	518.36	343.38	-	-
France	3075.18	3679.48	6607.11	1275.21
Hungary	268.3	141.30	846.80	31.30
Poland	1960.28	140.87	-	-
Spain	774.01	2011.04	13476.03	2360.95

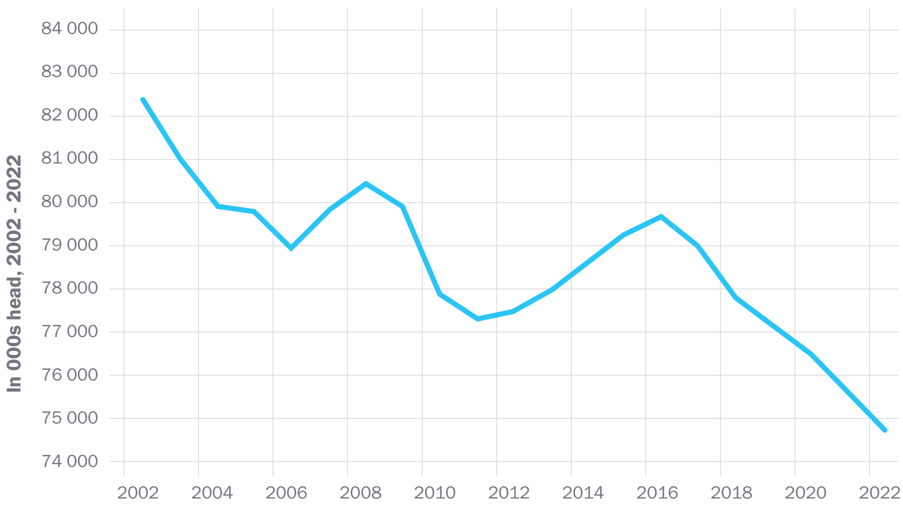
Note: Definitions of the livestock codes are as follows and sourced from European Commission (2023): Dairy cows (A2300F): Heads of female bovines (including buffalo) that have already calved and are primarily kept for milk production. Includes cull dairy cows removed from milk production, even if fattened before slaughter. Non-dairy cows (A2300G): Heads of female bovines that have calved and are primarily kept for producing calves or for work. Includes draught cows and cull cows not used for dairy. Live sheep (A4100): Heads of domestic sheep of the species Ovis aries L. Live goat (A4200): Heads of domestic goats of the subspecies Capra aegagrus hircus L.

The decrease in the number of both livestock farms and livestock population was part of a significant restructuring of the sector, with many small dairy farms shifting away from milk production and turning to beef production instead, while medium- to large-sized farms responded by expanding their dairy cattle herds. For example, Poland saw a shift from dairy to non-dairy cattle, resulting in a 17% increase in the total number of bovine animals from 2012-2022. (Levasseur 2023).

FIGURE 3:

Developments of cattle livestock in the EU

(Source: Levasseur 2023)



In addition, livestock density varies greatly between Member States and their regions (*see Figure 4*). Overall, the livestock density in the EU was 0.7 livestock units (LSU) per hectare of utilised agricultural area (UAA), in 2020 (Eurostat 2023b). Among the five case study countries Belgium is far beyond the EU average with 2.7 LSU/ha (*see Table 4*). Regionally, both, Belgium and France have so-called hotspot regions with a high density of LSU per hectare. In Belgium-Flanders, especially West-Vlaanderen (6.15 LSU/ha) and Antwerpen (6.06 LSU/ha), indicating intensive farming. Oost-Vlaanderen (3.54 LSU/ha) and Limburg (2.69 LSU/ha) also have significant densities. In France, the region of Brittany has the highest values with 2.42 LSU/ha (Eurostat 2020).

FIGURE 4:

LSU density index measured in LSU/ha, 2020

(Source: Eurostat 2020)

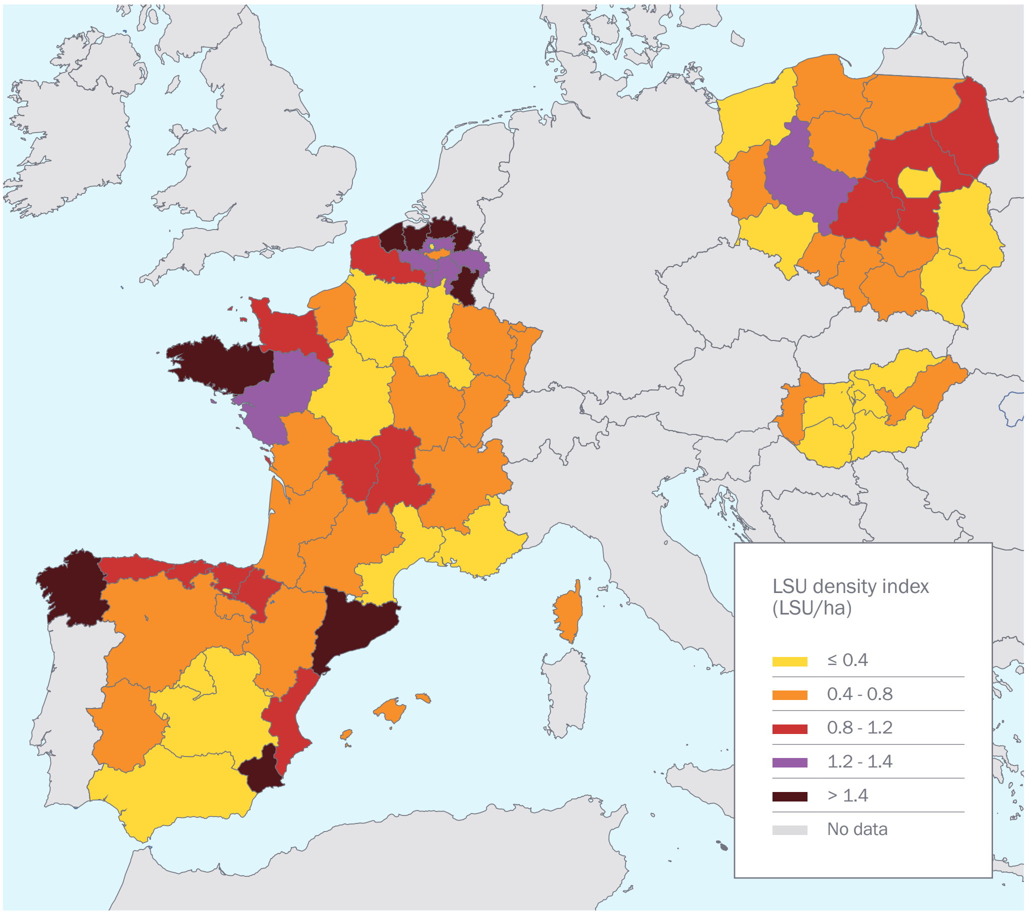


TABLE 4:

National average of livestock density (livestock units per ha of UAA) for the five case study countries

(Source: European Commission 2020)

Region	National average Livestock density (livestock units per ha of UAA)
Belgium	2.7
France	0.32
Hungary	0.4
Poland	0.7
Spain	0.7

3.2 GHG emissions from the livestock sector

The livestock sector in the EU contributes to climate change mainly by emitting methane and nitrous oxide through enteric fermentation and manure management dominating the emissions from the agricultural sector, making up 65% of total emissions coming from agriculture.

3.2.1 Enteric fermentation

Enteric fermentation is a natural digestive process that occurs in ruminant animals like cattle, sheep and goats. During this process, microbes in the rumen (a part of the digestive system) break down and ferment food, resulting in methane being released as a by-product. Methane emissions from enteric fermentation are influenced by a range of often complex factors, including age, weight, feed intake, type of diet (grazing or feed trough), purpose (milk production or fattening), breed, and more. Generally dairy cattle emit significantly more methane—about 2.5 to 3 times more—than non-dairy cattle (Levasseur 2023). On average, a dairy cow in the EU emits 132.8 kg of methane per year, compared to 47.9 kg for a non-dairy cow (*see Table 5*) (Levasseur 2023). This difference is primarily attributed to the higher feed intake required for milk production (Li et al., 2018).

Differences in methane emissions from enteric fermentation are observed across the EU. Generally, dairy cattle in northeastern EU countries emit considerably more methane compared to those in oceanic or temperate regions, where grazing is more prevalent. This pattern is less pronounced for non-dairy cattle. A range of complex factors contribute to these cross-country differences, including variations in cattle breeds, production systems, and, to some extent, climatic conditions.

TABLE 5:

Total direct GHG emissions per head of EU cattle

(Source: Levasseur 2023)

In kg of gas/head/year, 2021	Enteric fermentation	Manure management		Total
	CH_4	CH_4	N_2O	Equiv. CO_2*
Dairy cattle	132.8	21.43	0.62	4483
Non-dairy cattle	47.9	5.3	0.26	1559
Ratio Dairy/Non-dairy	2.8	4	2.4	2.9
In % of equiv. CO_2				
Dairy cattle	82.9%	13.4%	3.7%	100.0%
Non-dairy cattle	86.1%	9.5%	4.4%	100.0%

* Emissions of CH_4 and N_2O are expressed in CO_2-equivalent, taking into account a global warming potential of 28 and 265 for CH_4 and N_2O over a 100-year timescale (values used by Eurostat).

3.2.2 **Manure Management**

Manure management—which encompasses the storage and treatment of manure before it is utilised as fertiliser or fuel—is another key source of greenhouse gas emissions related to livestock. These emissions are heavily influenced by the method of manure storage. Under anaerobic conditions, such as in liquid-based systems (e.g., lagoons or slurry), methane is the primary gas emitted. In contrast, dry manure systems mainly produce nitrous oxide (FAO, 2023). The extent of CH_4 and N_2O emissions is shaped by local management practices and climate, both of which vary significantly across regions and countries. Specifically, longer storage periods and higher temperatures tend to increase methane emissions. For N_2O, emissions rise with higher nitrogen intake from feed (including certain amino acids), extended storage time, elevated temperatures, and greater aeration (Moeletsi and Tongwane, 2015).

Dairy cattle emit much more methane (around 4 times more) and nitrous oxide (around 2.4 times more) emissions through its manure than non-dairy (*see Table 5*). There are several factors explaining differences across countries in terms of methane emissions from manure management such as climate, husbandry of the animals and feed diet (Levasseur 2023).

3.2.3 **Comparison between the five Member States**

Among the five case study countries, France has the highest methane emissions from enteric fermentation and manure management produced by both dairy and non-dairy cattle which is mainly due to the high number of dairy and non-dairy cattle in the country. Whereas Hungary has the lowest methane emissions from enteric fermentation and manure management produced by dairy and non-dairy (UNFCCC 2023). Considering the emissions per head, among the five case study countries Hungary has the highest methane emissions from enteric fermentation and manure management produced by both dairy and non-dairy cattle (*see Figure 5* & *Figure 7*). This shows that, despite the low numbers of dairy and non-dairy cattle in Hungary compared to a much bigger country like France, the direct methane emissions per head are quite sizeable which can be linked to several factors mentioned above (i.e. production system based on age, weight, feed intake, type of diet (grazing or feed trough), breed, management practice for manure). A similar picture appears, concerning N_2O emissions from manure management, with France having the highest N_2O emissions for dairy and non-dairy (National Inventory Submissions 2023). In contrast, Hungary has the highest N_2O emissions per head per year for dairy cattle and Belgium the highest for non-dairy cattle (*see Figure 6* & *Figure 8*).

FIGURE 5:

Methane emissions from enteric fermentation and manure for dairy cattle

(Source: UNFCCC 2023, Levasseur 2023; adapted by the authors)

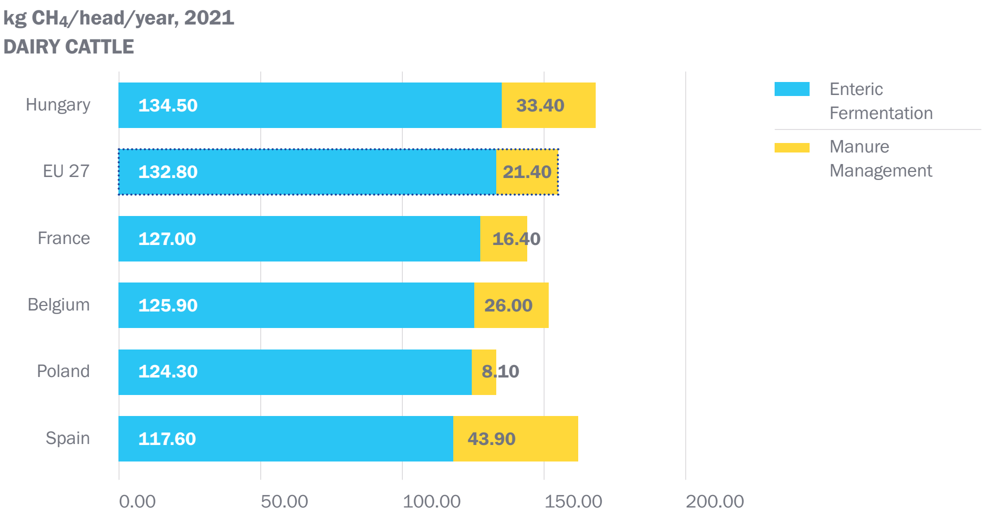


FIGURE 6:

Nitrous oxide emissions from manure management for dairy cattle

(Source: UNFCCC 2023, Levasseur 2023; adapted by the authors)

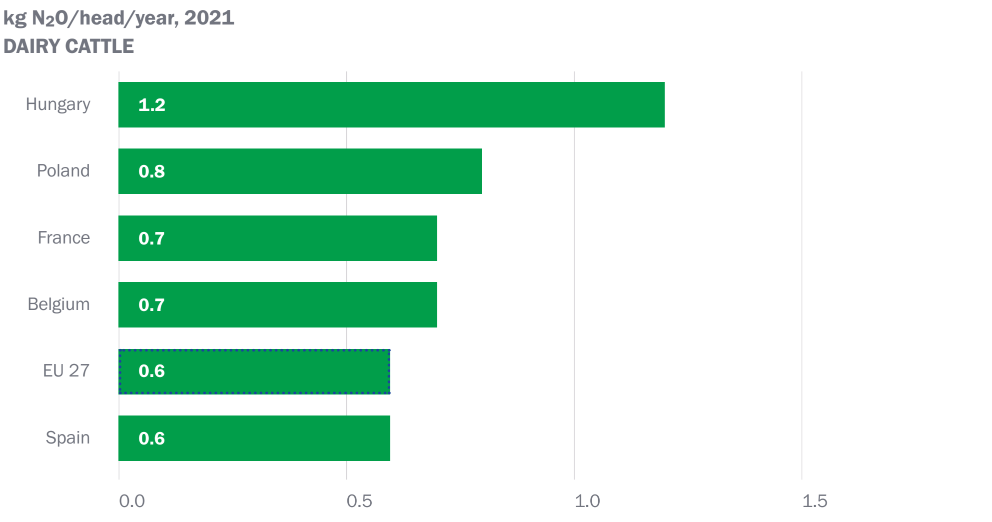


FIGURE 7:

Methane emissions from enteric fermentation and manure for non-dairy cattle

(Source: UNFCCC 2023, Levasseur 2023; adapted by the authors)

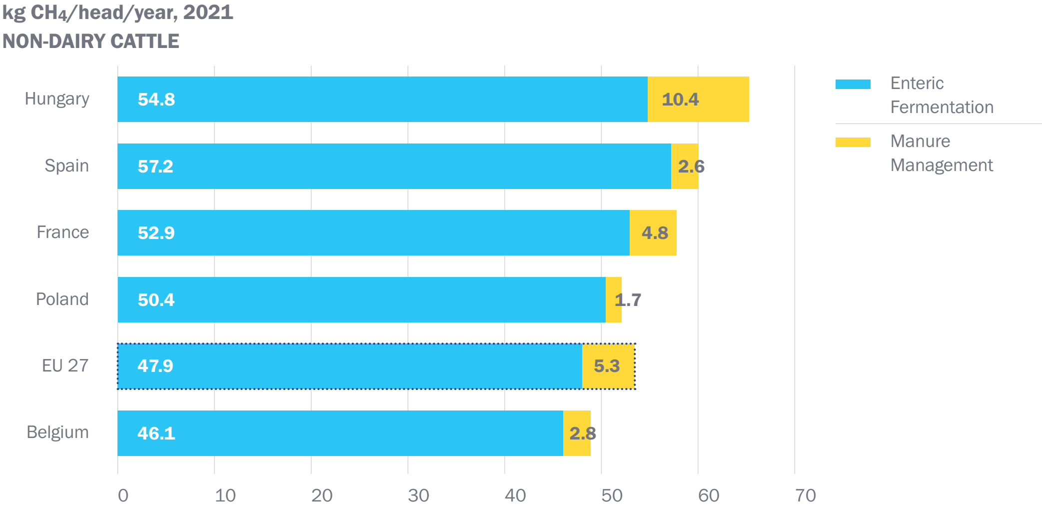
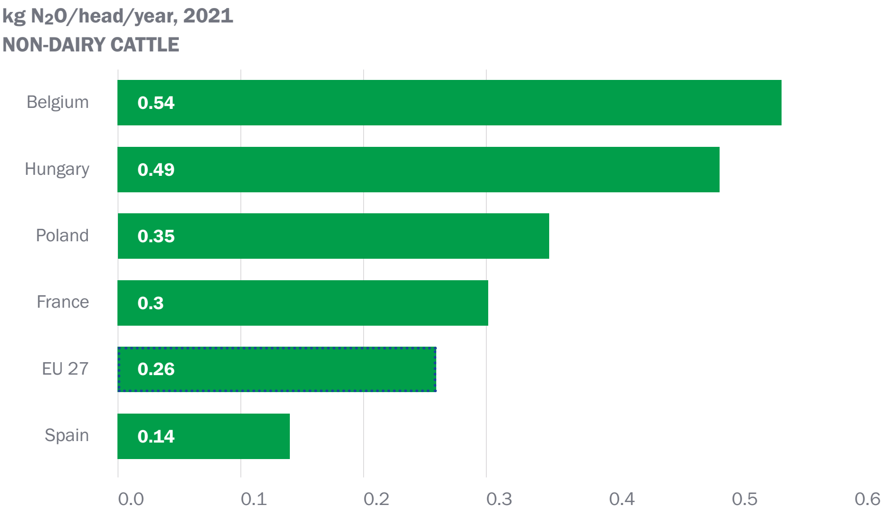


FIGURE 8:

Nitrous oxide emissions from manure management for non-dairy cattle

(Source: UNFCCC 2023, Levasseur 2023; adapted by the authors)



3.2.4 **GHG projections for the agricultural sector**

Non-CO_2 greenhouse gas emission reductions from the EU agriculture sector are covered by national targets under the Effort Sharing Regulation (ESR). Between 2005 and 2022 they only fell by 5%. Estimates indicate that these emissions fell by a further 2% between 2022 and 2023 (EEA 2024). The European Environment Agency (EEA) outlines two key scenarios: one reflecting existing measures (WEM) and another incorporating additional measures (WAM), both based on projections from Member States under the assumption of a continued current policy framework[9]. The projections indicate that, in the absence of new policies or measures, agricultural emissions are expected to rise from current levels through to 2030 (WEM). This would result in total EU agricultural emissions in 2030 being just 4% lower than the 2005 baseline. If the additional measures currently planned by Member States are fully implemented (WAM), the projected reduction would reach 7% below 2005 levels, indicating the need for further action to reduce livestock emissions (EEA 2024).

Among the five case study countries, Belgium has the highest project agricultural emission reductions with additional measures at around -24%, followed by Spain (around -19%) and France (around -7%). In Poland (+12%) and Hungary (+19%) emissions would still increase until 2030, even if additional measures are introduced (EEA 2024) (*see Figure 9*).

FIGURE 9:

Agricultural emissions and projected emissions by EU Member State

(Source: EEA 2024)

Note: The figure was adapted from the original, using boxes to highlight the member states considered by the authors.

3.3 Socio-economic situation of the sector

3.3.1 Number of people working in the agricultural sector

Agriculture accounts for around 4.2% of total employment in the EU in 2020, with an estimate of 8.7 million people employed in the sector (Eurostat 2022b). However, the share of employment differs across EU Member States. Among the five case study countries Poland has the highest share of employment in the agricultural sector compared to total employment in the country with 8% of the employees working in the agricultural sector; followed by Hungary (3.9%), Spain (3.5%), France (2.3%) and Belgium (0.8)[10].

3.3.2 Age structure of farm managers

Demographics show that in 2020 the majority (57.6 %) of farm managers were at least 55 years of age. Young farmers under the age of 40 only make up 11.9% of the farm managers (Eurostat 2022b). In the period 2005-2020, the share of young farmers in the total farming population declined in the EU[11]. Among the five case study countries Spain has the highest number of farmers over 55 years (66.6%) followed by Hungary (59.9%), Belgium (54.9%), Poland (49.5%) and France (46.3%) [12]. In contrast, Poland has the highest number of farmers under the age of 35 (11%), followed by France (9.7%), Belgium (6.3%), Hungary (4.9%) and Spain (3.9%))[13].

3.3.3 Economic Situation of the sector

Agricultural output is an important indicator to understand the economic situation of the of the agricultural sector within a Member State. The value of agricultural output includes both crop and animal production, excluding the output from agricultural services. Roughly half of the EU's total agricultural output value comes from crops and approximately two-fifths of the total output is derived from animals and animal products, with dairy and pigs accounting for the largest share. The contribution and proportion of animal and crop products vary considerably among Member States, reflecting differences in production volumes, market prices, and the types of crops cultivated, animals raised, and animal products collected[14]). Among the five case study countries France (16.2%) and Spain (14.1%) have the highest share of agricultural output in the EU, followed by Poland (7.3%), Belgium (2.4%) and Hungary (2.1%). The share of the livestock sector (excluding pigs, poultry and eggs) contributing to the agricultural output differs significantly among those five countries with around 30% in Belgium and France, and between 15% to 20% in Poland, Hungary and Spain[15].

CHAPTER 4

OPTIONS FOR REDUCING LIVESTOCK EMISSIONS FOR DAIRY AND NON-DAIRY

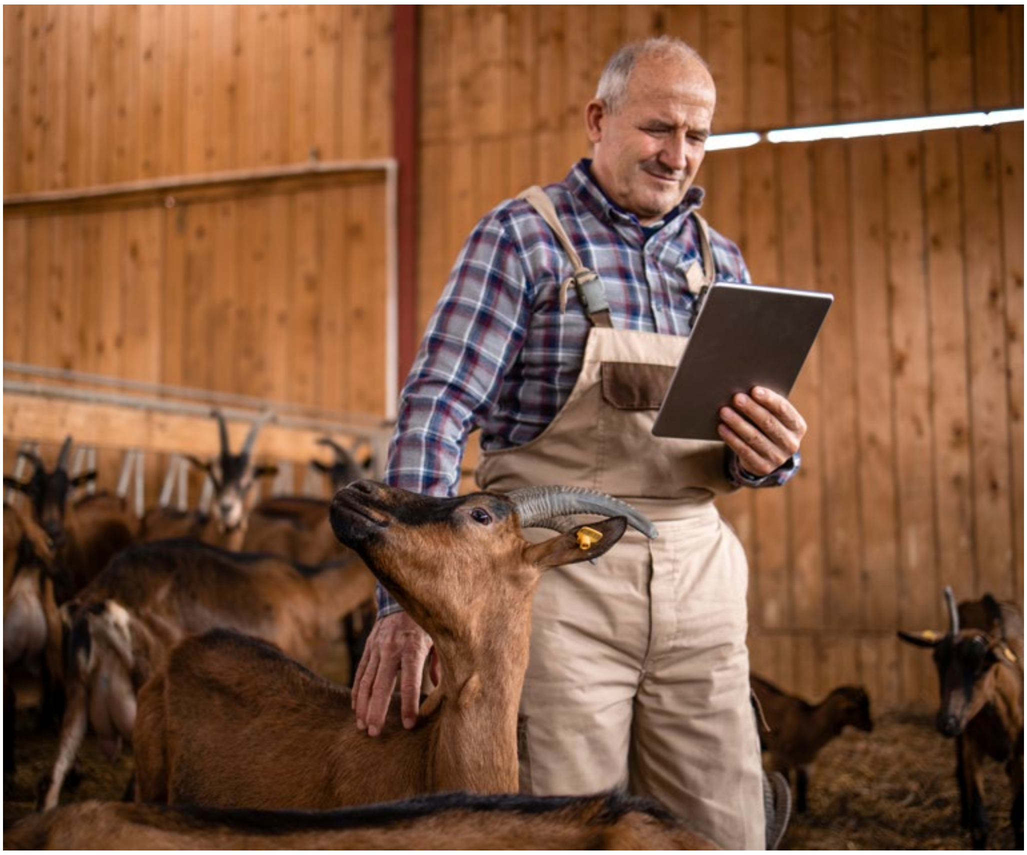
There is a range of agricultural measures to directly reduce CH_4 and N_2O emissions from the livestock sector with differing abatement potentials, effectiveness and levels of application described in the following chapter. For some of the practices involved, the measurement of GHGs and evaluating the effectiveness of livestock abatement options remain challenging due to the complexity of the biological processes involved and the need for comprehensive and detailed farm-level data. Dietary changes towards plant-based foods and reductions in food waste are among the most effective interventions for lowering emissions along the agri-food value chain (Clark et al. 2020), which are also shown by the EU scenario analyses (EC 2024; ESABCC 2023). Demand-side changes and food efficiency through waste reduction are usually not directly addressed through the CAP and the national CAP Strategic Plans (CSPs) and therefore not taken into consideration as part of this report.

4.1 Technological and management options for mitigating livestock emissions

There are limited but feasible technological and management options available to address emissions from the livestock sector (Scheffler and Wiegmann 2024). The technical report of the Joint Research Centre of the European Commission from 2020 (Pérez Domínguez et al. 2020) outlines the abatement potential for different mitigation measures compared to a reference scenario. According to the report, technological mitigation options in the livestock sector include anaerobic digestion, low-nitrogen feed, the use of feed additives, genetic improvements to enhance production efficiency, as well as vaccination against methanogenic bacteria in the rumen.

Anaerobic digestion: A biochemical process in which microorganisms break down organic material in the absence of oxygen. When carried out in a sealed environment—an anaerobic digester—this process produces biogas, a mixture typically composed of methane, carbon dioxide (CO_2), and traces of other gases. Biogas can be used as a source of electricity, heat, or vehicle fuel. The process also yields digestate, a nutrient-rich by-product commonly used as a substitute for synthetic fertilizers (Pérez Domínguez et al. 2020).

Low nitrogen feed: A technological mitigation strategy designed to reduce crude protein (CRPR) intake in livestock, thereby lowering ammonia (NH_3) emissions with positive co-benefits on N_2O and CH_4. By decreasing the nitrogen content in animal feed, nitrogen excretion by the animals is reduced, directly resulting in lower NH_3 emissions (Pérez Domínguez et al. 2020).



Feed additives: Supplementing animal feed with lipids or nitrates offer promising options for reducing methane (CH_4) emissions from livestock. Lipids, particularly linseed, can improve feed efficiency by enhancing energy utilization and reducing dry matter intake, leading to lower CH_4 emissions. However, their effectiveness depends on the overall feed composition, and excessive use may negatively affect digestibility. Similarly, adding nitrates to feed can significantly reduce CH_4 production by altering rumen microbial activity. While effective, nitrate use must be carefully managed to avoid potential health risks to animals (Pérez Domínguez et al. 2020).

Genetic improvements: There are different mitigation options available with regards to improved breeding. These are breeding for lower CH_4 emissions, breeding for higher milk yields and increasing ruminant feed efficiency.

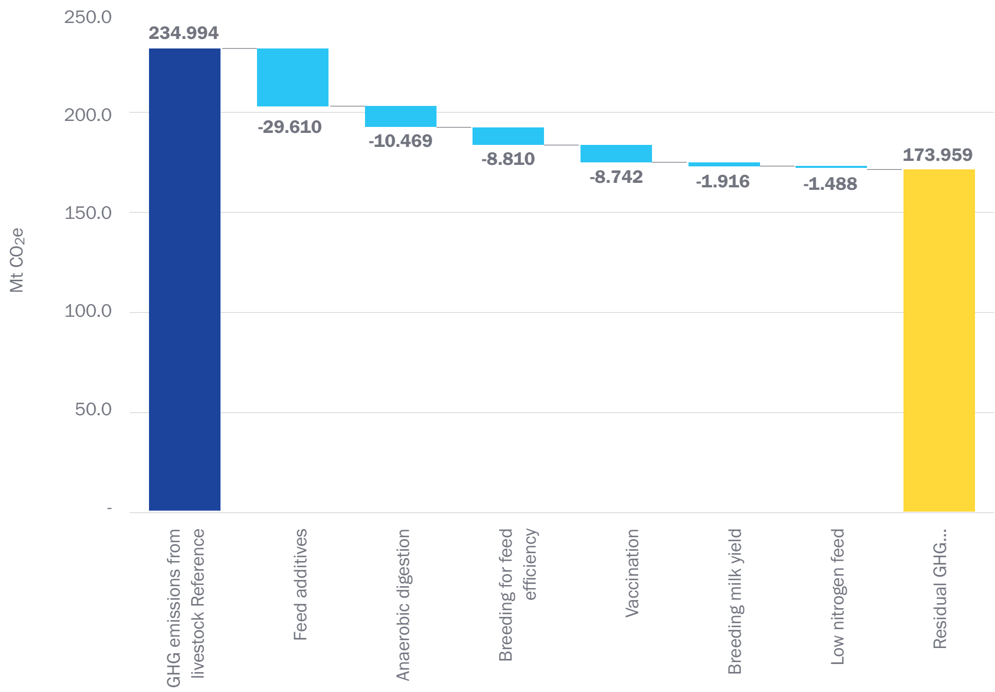
Vaccination: This mitigation technology involves developing vaccines that target methane-producing methanogens in the rumen, which are still under development.

Figure 10 illustrates the maximum technical mitigation potential based on the assumptions used in the CAPRI framework (Pérez Domínguez et al. 2020). Emission reductions are scenario assumptions on maximum feasible implementation and mitigation potential of the technical measures. This is in some cases not 100% of the technical potential, but includes already an assumption on what is feasible, e.g. only farms with more than 200 livestock units are eligible for anaerobic digestion of manure in biogas plants. Implementing these mitigation strategies could enable a reduction of around 25% in direct livestock emissions. However, approximately 75% of greenhouse gas emissions would not be addressed through the technical measures highlighted above.

FIGURE 10:

Mitigation potential for direct emissions from the livestock sector

(Source: Scheffler and Wiegmann 2024, based on Pérez Domínguez et al. (2020).



Note: Only direct CH_4 emissions from enteric fermentation and CH_4 and direct N_2O emissions from manure management are included.

In addition, there are a number of on-farm management practices aimed at improving nitrogen use efficiency, optimised feeding strategies (see also technological options) and extending calving intervals. However, evaluating the effectiveness of these measures remains challenging, largely due to the need for comprehensive and detailed farm-level data (Scheffler and Wiegmann 2024).

A number of farm infrastructure investment measures also exist that can contribute to emission reductions in the agricultural sector. These include investments in low-emission livestock housing, slurry covers, biogas plants for anaerobic manure digestion (for anaerobic digestion see above), energy-efficient heating systems, and advanced farm machinery such as low-emission slurry spreading technologies. However, such investments may carry the risk of lock-in effects, especially given uncertainties surrounding future emission trajectories and environmental conditions (Scheffler and Wiegmann 2024).

One of the most effective and straightforward measures to reduce GHG emissions from livestock is the reduction of livestock numbers, combined with dietary shifts away from animal-based proteins. According to the scenarios developed by Scheffler and Wiegmann (2024), reducing livestock numbers in combination with demand-side measures, is the only way to reduce the overall share of the agricultural emissions addressing the remaining 75% of greenhouse gas emissions not addressed by technological measures. The authors conclude that defining 'unavoidable residual emissions' in the agricultural sector is challenging due to the absence of clear targets, limited technical mitigation options, and the significant but underutilised potential of demand-side measures.

CHAPTER 5

CAP INTERVENTIONS IDENTIFIED TO REDUCE GHG EMISSIONS FROM LIVESTOCK

The 2023-27 CAP gives Member States considerable flexibility in the way they design their CSPs, using a mix of conditionality (basic requirements) and measures to provide financial support to farmers (interventions). The CAP[16] contains a number of interventions that Member States can use to address emissions from livestock. These include support for investments in infrastructure as well as area-based payments (eco-schemes and agri-environment-climate interventions). Technological options, such as improving feeding regimes and genetic breeding can be funded through both eco-schemes and agri-environment-climate interventions, while infrastructure improvements in manure management and storage are largely funded through the investment intervention.

Area-based interventions can also be used to influence livestock emissions indirectly through support provided to maintain extensive systems (e.g. via eco-schemes, agri-environment-climate interventions, support for Areas with Natural Constraints (ANC) and compensation payments to farms in Areas of Specific Disadvantage (ASD).

However, the CAP also provides income support to farmers that is coupled to specific types of production (coupled income support – CIS). Approximately 70% of all CIS is targeted to livestock (beef and veal; sheep and goat meat; milk and milk products), totalling €15.98 billion out of a total of €23.03 billion[17]. The justification provided by Member States for providing CIS for livestock is the lower income and/or profitability of the sectors supported (European Commission, 2023b). This approach has been criticised for distorting markets (OECD, 2017) and reinforcing greenhouse gas-intensive practices such as intensive livestock farming (Pe'er et al., 2017, 2020). In some Member States CIS are focused specifically at maintaining extensive systems, but eligibility criteria and safeguards for entry to the scheme (such as stocking densities) are only put in place in very few Member States (Catalogue of CAP Interventions, Frelih-Larsen et al., 2024). This type of support is therefore maintaining livestock numbers above the level at which they would be without support.

This chapter examines the potential available within the current CAP (2023-2027) to reduce GHG emissions from livestock. To do this it focuses on five Member States in particular: Belgium-Flanders, France, Hungary, Poland and Spain and looks at what CAP interventions they have programmed within their CAP Strategic Plans (CSPs) with a specific focus on livestock emissions, using the information available on the European Commission's catalogue of CAP interventions, and categorising the interventions using the farm practice classification (*see methodology in chapter 2*). It then delves into more depth on three interventions designed to reduce livestock emissions in Belgium-Flanders, Hungary and Spain and one intervention with more of an indirect focus on livestock emissions in France.

5.1 **Context in selected Member States**

To inform the drafting of their CSPs, The European Commission provided all Member States with a Staff Working Document containing recommendations for the needs and priorities to be addressed[18.] Reducing emissions from the livestock sector was a priority identified for all five of the countries examined in detail in this report.

Once Member States had submitted their draft CSPs for approval, these were reviewed by the European Commission and an observation letter was sent to each Member State setting out inter alia areas for improvement. For all five countries that are the focus of this report, concerns were raised about the lack of sufficient focus on emissions resulting from livestock production, both in relation to enteric fermentation and manure management (*see Table 6*). Member States were asked to respond to these, by making changes in their CSPs and/or justifying how the combination of interventions programmed would address the concerns identified.

TABLE 6:

Overview of the recommendations from the European Commission Staff Working document addressing the livestock sector

Country	Recommendations from the European Commission Staff Working document
Belgium-Flanders	Reducing non-CO_2 emissions from the livestock sector […]. Among other things, CAP interventions should support the shift to lower emission livestock production systems by also considering sustainable manure management in line with the Methane Strategy.
France	Strengthening efforts to reduce GHG emissions […]. Recommended actions include supporting relevant farm and agri-food investments, strengthening advisory services and promoting on-farm GHG assessment tools to improve energy and climate performance.
Hungary	Promote climate mitigation practices […] for instance by […] improving feed and manure management to decrease methane emissions (in line with the Methane Strategy) […].
Poland	Continuing efforts to reduce net emissions from agriculture by focusing on reducing emissions related to […] better livestock management (ruminants), especially by adapting feeding strategies so that to reduce emissions from enteric fermentation in line with the EU Methane Strategy.
Spain	Mitigating climate change and reducing GHG emissions from agriculture, through an appropriate mix of suitable tools under the new Green architecture […]. These interventions shall support […] improvement of manure management. Particular attention needs to be paid on reducing GHG emissions from enteric fermentation in line with the Methane Strategy, by providing support for advice, innovation, land management practices, biogas production (anaerobic digestion), as well as adoption of low emission feeding strategies.

However, it has become evident that emissions from enteric fermentation and manure management remain areas that are not well addressed through the CSPs, as highlighted below.

The European Commission's overview of CSP implementation in 2023-24 (European Commission, 2025a) identified a few CSPs which had included a specific focus on reducing livestock-related emissions (11 of 28 CSPs), mainly methane from ruminants, and GHG and ammonia from manure management, however it highlights that these measures only target two percent of all EU livestock units (LU)[19].

The limited focus on livestock emissions is further reinforced by a recent study (European Commission, 2025b) which showed that the potential contribution of all CSPs to GHG emission reductions relating to enteric fermentation and manure management was estimated to be negligible (17 kt CO_2e annually compared to the 35 Mt CO_2e estimate per year on average over the 2023-2027 period for all CSPs). There are two main reasons for the limited potential identified by the study. First the fact that very few CSP interventions were identified that specifically target the relevant practices and second, the lack of available data to establish the values for mitigation potential[20] for several of the relevant farming practices. The report notes that "(t)his is particularly notable given that emissions from livestock represent a significant share of nonCO_2 emissions of the agricultural sector in some Member States, and accounting for 66% of emissions reported on average over the 2018-2022 period in CRF sector 3 (agriculture)." The report stresses that this finding relates only to the contribution of CSPs – it does not consider the effects of other policies or initiatives in Member States that may focus on reducing emissions from livestock.

The following sections examine what interventions have been put in place in five Member States to address emissions from livestock and explore the rationale for the choices made. Examples of the interventions used are set out in more detail the sections below to serve as inspiration for the sort of measures that could be adopted in other countries in the future.

5.2 Interventions identified to reduce livestock emissions

In order to identify the CSP interventions focusing on reducing emissions from livestock, the JRC's farm practice classification was used as explained in chapter 2 outlining the methodological approach.

Based on this analysis, only four interventions were identified that were directly focussed on reducing GHG emissions from livestock as follows:

- **Two eco-schemes** in Belgium-Flanders and Poland. The Flemish scheme aims to incentivise cattle farmers to implement changes in feeding strategies to reduce enteric methane emissions from cattle; and the Polish scheme 'carbon farming and nutrient management' includes options for mixing solid manure on arable land within 12 hours of its application and using liquid manure with methods other than splashing.
- **Two Investment measures** in Hungary and Spain, both including the possibility for support in relation to improving manure storage and management activities; and in Spain also allowing for investments in low-emission feeding systems.

Three of these interventions, considered to have the greatest potential for emission reductions, were chosen for a more in-depth review and are described in more detail in section 5.3.

In terms of budget allocations, the amounts allocated to the interventions identified as having a potentially direct positive impact on emissions related to livestock in the five countries amounts (total public expenditure) over the whole programming period are shown in Table 7). However the total figures for the Spanish and Polish interventions cover a wide range of actions that are not all linked to reducing livestock emissions (e.g. irrigation in Spain, or winter catch crops in Poland)

TABLE 7:

Budget allocations for interventions with a potential direct positive impact on livestock emissions

(in Million Euros).

	BE-Flanders	ES	FR	HU	PL	Total
Eco-scheme	€ 7.8	€ -	€ -	€ -	€ 2,777	€ 2,785
ENVCLIM	€ -	€ -	€ -	€ -	€ -	€ -
INVEST	€ -	€ 129.2	€ -	€ 8.1	€ -	€ 137.4
CIS	€ -	€ -	€ -	€ -	€ -	€ -
Total	€ 7.8	€ 175.4	€ -	€ 8.1	€ 2,777	€ 2,968

To put these figures in context, in Belgium-Flanders, the budget for this particular eco-scheme (feed management in cattle) comprises 3% of the total eco-scheme budget in Flanders and 0.02% of the total CSP budget (EU and national funding). In Poland the carbon farming and nutrient management eco-scheme budget allocation is much higher at 64% of the total eco-scheme budget and 6% of the total CSP budget, however it should be noted that this eco-scheme comprises a number of sub-options, not all of which are directly related to livestock emissions.

In Hungary, the budget allocation for the investment measure (farm development to reduce ammonia emissions) comprises 1.3% of the total funding allocated to the investment intervention, equivalent to 0.02% of the total CSP budget. Finally, the allocation to the investment measure in Spain (Aid for productive investments on agricultural holdings linked to contributing to climate change mitigation/adaptation, efficient use of natural resources and animal welfare) is slightly higher, at 4.8% of the total funding allocated to investment support, equating to 0.35% of the total CSP budget. For both these investment interventions, only a proportion of the budget can be attributed to livestock emissions. For example, in the case of Spain, investments can also be made for improving energy efficiency and producing green energy; investments for efficient management of water, soil and air resources; to improve animal welfare as well as for biosecurity measures on agricultural holding.

A greater number of potentially harmful livestock interventions were identified. These comprised coupled income support (CIS) payments targeted at livestock where no eligibility criteria were evident (most CIS in France and Poland and all CIS in Hungary). The CIS in Spain and a few in France and Poland were identified as having 'no significant' impact due to the fact that eligibility criteria have been put in place to limit the number, type or density of livestock that could receive support.

The budget allocated to supporting ruminant livestock through CIS (categorised as having both a negative and no significant effect) totals €9 billion for the five countries (€4.4 billion for those categorised as having no significant impact and €4.6 billion for those with the potential to have a negative impact). Table 8 compares the budget for the interventions with a potentially direct impact on livestock emissions against the budget targeted at livestock under CIS. In Hungary the budget allocated to livestock related CIS payments is 76 times higher than that allocated to interventions with a potentially direct positive impact on livestock emissions, and in Spain the CIS budget is 21 times higher. The percentage for Spain would be even higher if only the expenditure linked to actions directly affecting livestock emissions were considered (e.g. the actions for manure management or low feeding techniques[21]). In Poland, the converse is true, with the planned budget for the eco-scheme is 1.5 times higher than the livestock related CIS budget, however only part of the eco-scheme budget is identified as having the potential to reduce livestock emissions. The calculations were not possible for the other two Member States.

TABLE 8:

Comparison between budget allocations for CIS and interventions with a potentially positive direct impact on reducing livestock emissions

	Budget for intervention(s) with a potentially positive direct impact on livestock emissions (A) – million euros	Budget for CIS supporting ruminant livestock (B) – million euros	Percentage (A/B)
BE-Flanders	€ 7.8	None identified	n/a
France	No interventions identified	€ 3,941	0%
Hungary	€ 8.1	€ 638	1.3%
Poland	€ 2,778	€ 1,711	162%
Spain	€ 129	€ 2,716	4.7%

5.3 Detailed examples of CAP interventions with a direct focus on reducing GHG emissions from livestock

This chapter provides further detail on the four interventions identified as having the potential to have a direct impact on reducing emissions from livestock in Hungary, Flanders (Belgium), Spain and France.

5.3.1 Belgium-Flanders – Eco-scheme: Feed management in cattle

The eco-scheme "Adjustments to farm level feed management in cattle to reduce greenhouse gas emissions" (abbreviated: Feed management in cattle) (1.17) supports the use of methane-reducing feeding strategies in cattle farming. It is part of Flanders' 2023–2027 CSP and contributes to climate objectives by targeting enteric methane (CH_4) emissions from both dairy and beef cattle.

The scheme is embedded within a broader emissions reduction strategy outlined in the Flemish Energy and Climate Plan, which aims to reduce enteric emissions by 0.44 Mton CO_2-eq by 2030, equivalent to a 19% cut from 2005 levels (Vlaamse Regering, 2022). In addition to CAP-funded measures such as eco-scheme 1.17, the plan foresees a wider set of initiatives under the *Enteric Emissions Cattle 2019–2030* convention. These include further research and implementation of feed efficiency improvements, use of food additives, genetic strategies, and cattle longevity, all coordinated with sector actors. Beyond enteric emissions, the plan also outlines complementary actions such as small-scale manure fermentation, improved manure storage, and precision spreading, some of which are supported via national and regional funding instruments outside the CAP[22].

The eco-scheme's implementation is linked to the "Enteric Emissions Cattle 2019–2030" covenant, which combines market-driven approaches with public incentives (Departement Landbouw & Visserij, 2019). While this collaboration seems to be a cornerstone of the scheme's design, it is not explicitly detailed in the CSP. This covenant was designed to share the mitigation burden between public authorities and industry stakeholders, including dairy and meat processors and the feed industry. However, despite its broad eligibility and adaptive design, uptake remains lower than expected, with just 70 farms participating in 2023, and 183 applications by May 2025 (information provided by the interviewees). Factors for low uptake are limited cost coverage, administrative burden, practical constraints on feed administration, and inconsistent industry co-financing. Interviewees confirm that only a few processors are contributing financially, and many farmers are left to shoulder a significant portion of the cost (BE authority interview).

The intervention seeks to reduce emissions from cattle by incentivising the use of feed additives that limit methane production during digestion. It directly supports CAP Specific Objective 4 (SO4), which focuses on *climate change mitigation and adaptation*, in particular by reducing greenhouse gas emissions from agriculture. The measure does not target a specific Flemish region or farm size. It is open to both dairy and beef systems. The broad eligibility allows participation across a wide range of cattle operations, although the design may favour more intensive systems where feed management is more easily controlled (Vlaamse Regering, 2022).

Participating farmers are required to implement one or more scientifically approved feed strategies that reduce methane emissions from the rumen, the first stomach chamber in ruminants where fermentation occurs. The emission reduction potentials of these measures are provided per animal per year and are expressed as percentage reductions in enteric methane (CH_4) compared to standard rations. The available options include:

- the addition of extruded/expanded linseed (approx. 9% CH_4 reduction in dairy cattle);
- nitrate supplementation (10% in dairy and 8% in beef);
- 3-NOP (3-Nitrooxypropanol), an enzyme inhibitor that can reduce methane by up to 26% depending on dosage; rapeseed fat (5% reduction in dairy); and
- brewers' grains with rapeseed meal (8% in dairy, discontinued after 2023).

From 2024 onwards, only individual applications of linseed, nitrate, and 3-NOP, as well as combinations of linseed + nitrate and nitrate + rapeseed fat, are permitted. However, no specific methane reduction figures are provided for these combinations (Vlaamse Regering, 2022).

However, implementation is not always straightforward. Feed additives must be carefully integrated into diets, sometimes replacing other ration components, which typically requires support from a feed advisor employed by the feed industry (BE authority interview). The intervention requires an adjustment of protein content when supplementing nitrate (Vlaamse Regering, 2022). While nitrate supplementation is recognised for its methane-reducing potential, it carries risks if not properly managed. Improper balancing of nitrate with dietary protein levels can lead to increased nitrogen excretion in manure (see Feng et al., 2022). This excess nitrogen can result in elevated emissions of nitrous oxide, thereby potentially offsetting the climate benefits achieved through methane reduction.

The decision to discontinue support for brewers' grains and rapeseed meal is not detailed in the CSP, but due to its common use in Flemish cattle feed, this may limit the potential to demonstrate additional methane savings. The scheme is designed to be adaptive, with new measures and combinations potentially added over time, based on advice from a dedicated steering committee (Vlaamse Regering, 2022). According to the interviewees, details of each approved measure, including eligibility conditions and dosage, are made publicly available in technical fiches to guide implementation.

Eligible participants must be active cattle farmers operating in the Flemish Region. Key entry requirements include accurate registration of bovine animals and annual feed ration calculations. Organic farms are excluded from the scheme, as none of the additives are authorised for organic use (BE authority interview). Generally, at least one approved feed measure must be applied in line with the intervention's technical guidelines. No specific training or advisory participation is required, and there are no restrictions based on farm size or structure (Vlaamse Regering, 2022).

Support is provided in the form of fixed daily payments per animal, based on the additional cost of using methane-reducing feed measures. The payment rates vary by measure and are capped annually. For example, linseed receives €0.08 per animal per day (up to 200 days/year), nitrate €0.04/day (up to 355 days/year for dairy and 365 for beef), and 3-NOP €0.07/day (up to 355 days/year). These rates cover approximately 27–57% of the estimated additional feed costs, with total feed measure costs ranging between €0.12 and €0.30 per animal per day, depending on the additive used. Uptake has been further hindered by the lack of standardised financial contributions from processors (BE authority interview). Although some dairy companies provide top-up payments or directly finance specific additives like 3-NOP, this remains the exception, not the norm (BE authority interview). As a result, many farmers do not see a strong economic case for participation, particularly in light of the administrative burden of tracking livestock units and feed application (BE authority interview). Payments are only granted if all regulatory conditions, including ration composition, are met (Vlaamse Regering, 2022).

The scheme targets an annual average uptake of 60,530 livestock units, varying between 2024 and 2028, for a total of 302,650 LU over the CAP period. For comparison, Flanders had 343,840 dairy cows in 2020 (≈343,840 LU), and a total bovine population of 1.27 million heads, or approximately 886,000 LU assuming an average LU factor of 0.7 (Eurostat, 2025). This suggests that the measure could reach up to 88% of the dairy herd, or about 34% of total bovine LU, indicating a moderate level of coverage. Despite being in its third year, the measure has not reached its annual uptake target. As of 2023, only 70 farms had applied, and uptake among beef farmers is particularly low, with fewer than 10 participants (BE authority interview). The reasons for the low level of uptake are varied, including the payment level as well as the limitations resulting from the scheme requirements (see above). However, perceptions also play a role. For example, some farmers associate methane-reducing additives with reduced milk yields or negative health impacts, although these concerns are largely anecdotal (BE authority interview). Interviewees also confirmed that stronger industry participation, particularly from dairy processors, is key to increasing adoption, but so far this has not materialised at the necessary scale (BE authority interview).

The total budget for the intervention is €7.8 million over five years. This is based on an average annual payment of €28 per livestock unit (LU), within a fixed range of €20 to €40. This payment level reflects the estimated average cost of eligible measures, which vary between €14.20 and €24.85 per LU per year. To accommodate cost fluctuations, a flexibility band between €18 and €24 is provided. In line with Article 102(2) of Regulation (EU) 2021/2115, regional mechanisms are in place to adjust financial allocations in case of over- or underutilisation.

To summarise, the measure is estimated to contribute directly to the Flemish climate target of reducing enteric methane emissions by 0.44 Mton CO_2-eq by 2030 (Vlaamse Regering, 2022). While limited in its overall sectoral coverage, it targets key mitigation points in cattle production and offers potential for measurable reductions in CH_4 emissions, particularly in dairy systems, if issues surrounding uptake can be overcome:

- **Limited cost coverage:** the payments cover only 27–57% of the actual feed additive costs;
- **Administrative burden:** Farmers must register bovine animals and calculate rations annually;
- **Application constraints:** Some measures, especially 3-NOP, require controlled and frequent administration, limiting use in pasture-based systems;
- **Industry support gaps:** Only a few dairy processors co-finance; others do not uphold their side of the agreement.
- **Farmer perceptions:** Some believe the additives may reduce milk yield or affect animal health (according to interviewees).

5.3.2 **Hungary – Investments: Farm development to reduce ammonia emissions**

The intervention "Farm development to reduce ammonia emissions" (RD01d_EO1_FRM_73) is an investment measure under Article 73 of Hungary's 2023–2027 CSP. It supports technological upgrades to manure management systems in order to reduce ammonia (NH_3) emissions from livestock holdings. The roll-out of the intervention is planned for autumn 2025 (HU authority interview). The reason it has not yet started is to avoid overlap with related measures under the previous CAP programming period that were still operating.

While not explicitly identified as a livestock GHG mitigation measure, it contributes to climate objectives through the actions also leading to reductions in nitrous oxide (N_2O) and potentially methane (CH_4) emissions. With a planned output of 154 supported investment operations and a total budget of €8.14 million (catalogue of CAP interventions), the measure takes a targeted approach focused on high-value investments, rather than wide-scale adoption. Its overall mitigation impact on livestock emissions will depend on the general uptake and choice of supported investment types.

The intervention aligns with Hungary's commitment under the NEC Directive (Directive 2016/2284/EU) to reduce NH_3 emissions by 32% by 2030, relative to 2005 levels. Given that approximately 92% of Hungary's ammonia emissions originate from agriculture, the measure targets one of the country's key environmental challenges. The intervention is not targeted by sector (e.g. pigs or dairy) or by region (Magyarország Kormánya, 2023), but is naturally suited to intensive livestock producers, where emission abatement potential is highest (HU authority interview).

Support under this intervention will be awarded through a competitive, project-based application process. Applicants must first meet a set of eligibility conditions to be accepted. However, being eligible does not guarantee funding. Only projects that score favourably against the defined selection criteria, covering environmental, technical, social, and economic aspects, are ultimately approved (Magyarország Kormánya, 2023). From a climate perspective, several selection criteria are particularly relevant to mitigate emissions from livestock. These include[23]:

- Improving input-use efficiency, such as reducing nitrogen losses from manure or fertiliser use; and
- Lowering emissions per unit of output.

The intervention supports a range of capital investments to modernise manure management systems and reduce emissions (Magyarország Kormánya, 2023). Eligible actions include:

- Modern manure application technologies such as injection and immediate incorporation, which reduce NH_3 volatilisation and indirectly N_2O.
- Upgrading manure treatment infrastructure both inside and outside barns, including systems for aeration, separation, and pre-storage conditioning.
- Barn-level infrastructure improvements like flooring upgrades, roof insulation, drip-free drinkers, and air scrubbers, which help reduce CH_4 emissions.
- Construction or retrofitting of covered manure storage facilities, which is explicitly highlighted in the CSP as a key emission reduction action.

Other eligible costs include the modernisation of facilities, machinery purchases, digital technologies, consulting services, feasibility studies, and intangible assets such as software and licences. Real estate acquisition is eligible within certain limits (5–10% of total costs). All investments must go beyond minimum legal requirements, including those under the Nitrates Directive (91/676/EEC) and relevant national decrees.

Beneficiaries must report annually on technology use and NH_3 emissions and are subject to a five-year maintenance obligation (Magyarország Kormánya, 2023).

To be eligible, applicants must be active agricultural producers, either as individuals or legal entities. They must have achieved a minimum standard output[24] of €10,000 from agricultural production in the previous business year and demonstrate that at least 40% of their total revenue is derived from agricultural activity (Magyarország Kormánya, 2023). These conditions apply to individual farmers, producer cooperatives, and consortia, with all members of a consortium required to meet the thresholds. Cooperatives may also qualify if at least 40% of their members individually meet the standard output requirement. A wide range of legal forms is accepted, including natural persons (i.e. individual farmers), companies, cooperatives (including social cooperatives), and non-profit organisations such as foundations or church-affiliated legal entities. Additionally, recognised partnerships and enterprises involved in the processing or marketing of medicinal plants are also eligible, even if they do not meet the income thresholds (Magyarország Kormánya, 2023). There are no requirements for prior training or advisory service participation as a condition for entry.

The scheme operates on a cost reimbursement basis (Magyarország Kormánya, 2023). Financial support ranges from 50% to 80% of eligible investment costs. Additional support is available for beneficiaries using institutional guarantee services at a reduced rate (additional 5%), and as interest support for investments involving financial loans (additional 10%). The maximum grant per project is capped at €8 million. There are no differentiated payment rates by action type, farm type, or location.

The intervention is expected to support 154 new investment operations over the 2023–2029 period (Catalogue of CAP interventions). The annual distribution is as follows:

- 2023–2024: 0 operations
- 2025: 22 operations
- 2026: 0 operations
- 2027–2029: 44 operations per year

This distribution suggests a phased roll-out, with the majority of implementation occurring in the second half of the programming period.

The total public budget allocated to the intervention over the 2023–2029 period is €8,139,535, of which €3,500,000 (43%) is provided through EU co-financing, and the remaining €4,639,535 (57%) is financed from national funds (catalogue of CAP interventions). Although the full budget is administratively allocated to the years 2025 and 2026, actual disbursement will occur progressively over time, as the measure operates on a cost-reimbursement basis, following the completion of investment activities. The funding is distributed evenly across the two years, with approximately €4.07 million allocated each year (Magyarország Kormánya, 2023). While the maximum grant per project is capped at €8 million, the planned support of 154 individual investment operations over the programme period suggests that Hungary intends to distribute funding across a wide base of beneficiaries rather than concentrating it in a few large-scale projects. However, the interviewee from the Hungarian ministry expects that larger projects will apply.

The CSP does not provide a quantified GHG abatement estimate for this measure (Magyarország Kormánya, 2023). No relevant modelling or interview-based data were available at the time of writing.

5.3.3 Spain – Investment: Aid for productive investments on agricultural holdings linked to contributing to climate change mitigation and adaptation, efficient use of natural resources and animal welfare

The intervention *'Aid for productive investments on agricultural holdings linked to contributing to climate change mitigation - adaptation, efficient use of natural resources and animal welfare'* (6841.1) is part of the Spanish CSP and linked to three strategic objectives, including SO4 for climate change adaptation and mitigation[25]. The intervention is an investment measure that supports the reduction of GHG emissions by reimbursing farmers up to 80% of the costs that they incur for eligible investments. The intervention is quite broad in its remit, covering climate change mitigation and/or adaptation; improving energy efficiency and producing green energy; investments for efficient management of water, soil and air resources; and investments to improve animal welfare as well as for biosecurity measures on agricultural holding.

In relation to reducing emissions from livestock, the most relevant types of actions that can be funded include: investments to improve manure management or other investments that help reduce GHG emissions from enteric fermentation in line with the 'EU Methane Strategy', providing support for investment in innovation as well as in the low-emission feeding strategy, by developing on-farm feed mixes that contribute to this objective. Other possibilities with more of a potential indirect effect on livestock emissions is support for switching to endangered livestock breeds which are better adapted to future climatic conditions. Actions to improve animal welfare may also help reduce livestock emissions, by reducing the number of unproductive animals, but only if this does not lead to an increase in livestock numbers overall.

The intervention has a basic set of eligibility criteria making it available to all farmers, however, the investments measures do need to comply with specific criteria in order to be reimbursed. Young farmers are prioritised for support. The intervention is national in scope, but, as with all interventions programmed under EAFRD, the regions have flexibility in how the intervention is applied. It is applied in 10 of the 17 Spanish regions: as follows: Galicia, Madrid, Extremadura, Navarra, Murcia, Cantabria, Andalucía, Asturias, Castilla y León and Cataluña. The total planned output for all regions covered is 3,841 operations, 682 projects and 282 investment units although this includes investments in all categories with a total budget of €129.2 million over the whole period.

The flexibility that regions have in designing this investment intervention, means that regions can decide whether or not to make the intervention available to farmers and if they do, the type of support offered can vary, particularly since this is such a wide-ranging intervention. Of the ten regions using the intervention, five explicitly provide support under the climate mitigation and adaptation theme (*see Table 9*). It has not been possible to ascertain the precise focus of this support in all regions in which it is available. However, the description of the intervention in the CSP provides a non-exhaustive list of the types of investment that could be eligible. Of this list, some of those that would be relevant for reducing livestock emissions are:

- Investments in feed mixing equipment, which allow for the reduction of livestock effluents.
- Tangible and intangible investments which improve the overall performance, competitiveness or viability of holdings. In particular: manure storage and the improvement of the ventilation and isolation systems of livestock farms.

In Cataluña, for example, the eligible actions relevant for reducing livestock emissions include:

- the acquisition and installation of livestock manure treatment technologies[26] on the livestock holding and for treating manure produced on the holding;
- other investments on farms that lead to a reduction in greenhouse gas or ammonia emissions;
- encouragement of the installation of new low-emission feeding systems in case of intensive livestock farming: automatic feeding systems, wet-dry feeding systems, liquid feeding systems; electronic feeding systems, or precision feeding systems.

For the intervention more generally, the CSP identifies separate eligibility criteria depending on how funds are used, however these are particularly focused on irrigation related investments and none identified that focus on investments for climate mitigation purposes.

Farmers who receive support under this intervention have their costs incurred reimbursed. This reimbursement cannot exceed 80% (85% for small farmers) of the original cost of the measure implemented and is reimbursed either as Unit Costs, Lump sums, and/or Flat rate financing. These percentages are fixed nationally; however, the regions have the flexibility to define the form and intensity of their aid. Including the minimum costs that can be reimbursed and to some extent specific eligibility criteria. For example, in the region of Andalusia the basic aid rate is set at 50%, which can be increased to 80% depending on the personal and working characteristics of the beneficiary, the productive orientation of his holding or location, or the type of investment supported.

A breakdown of the planned number of investments relating to the climate mitigation and adaptation category by regions, including the average unit amount per investment is set out in Table 9. This was only possible for a selection of regions as not all regions break down their investments by theme. It was not possible to identify figures on uptake since this information are only available at the regional level.

Of the total planned outputs identified above, the data in Table 9 suggests that at least 2,271 operations (59%), no projects and 5 investment units (1.8%) are related to climate mitigation and adaptation. The majority (81%) of these operations are identified in Cataluña.

TABLE 9:

Planned number of on-farm investments under Investment intervention 6841.1 linked to climate change mitigation and adaptation

Spanish Region	Planned number of supported on-farm investments related to climate change mitigation or adaptation (Output Indicator 20)	Planned unit amount (average)
Andalucía (ES61)	373 operations	€51,000 (average)
Asturias (ES12)	Unclear as not broken down by theme	
Cantabria (ES13)	2 options available: 1 (CAN68411_04) – 10 operations 2 (CAN68411_05) – 15 operations	Differ by option: 1 - €30,000 2 - €60,000
Cataluña (ES51)	1,850 'mitigation investments' (operations)	€20,000 (average)
Castilla y León (ES41)	Unclear as not broken down by theme	
Extremadura (ES43)	5 investment units	€100,000 (average)
Galicia (ES11)	Unclear as not broken down by theme	
Madrid (ES30)	Different options available: 1 (MAD68411_03): 6 operations 2 (MAD68411_04): 17 operations	Differ by option: 1 - €10,000 (average) 2 - €200,000 (average)
Murcia (ES62)	None focused on climate mitigation/adaptation	
Navarra (ES22)	Unclear as not broken down by theme	

The total budget allocated to this intervention between 2023-2029 is €129.2 million.

5.4 Interventions identified with the potential to influence livestock emissions indirectly

In addition to those interventions that had a direct link to livestock emissions, a further category was identified comprising interventions with a potential indirect link to livestock emissions. These were interventions whose main focus was not the reduction of GHG emissions related to livestock, but where elements of the requirements had the potential to affect livestock emissions indirectly. These types of interventions were identified in all five Member States and related, for example, to:

- support for maintaining extensive grazing systems, often combined with limits on stocking densities;
- support for promoting protein crop production for feed to increase protein autonomy. and reduce imports from abroad, therefore potentially reducing the sectors' global footprint;.
- promotion of the use of organic fertiliser rather than chemical inputs;
- support for transitioning towards more agro-ecological practices (in France specifically);
- Support for improving animal welfare to increase the productive lifespan of ruminants and reduce the number of unproductive animals;

A total of 25 interventions with a potential indirect impact on livestock emissions were identified in the five Member States (*see Annex 2*), including four eco-schemes (Belgium-Flanders, Poland and Spain), 14 agri-environment-climate measures (all countries), one investment intervention (Belgium-Flanders) and six instances of Coupled Income Support (all but Spain).

In light of the interviews carried out in all Member States, the French Agri-environment scheme to promote a transition towards agro-ecological approaches is also considered in more detail (*see section 5.4.3*) since part of the scheme encourages farmers to improve the farm carbon balance, which can include actions to address livestock emissions.

In terms of budget, in total €7.25 billion is allocated to these 25 interventions that have the potential to contribute indirectly to reducing emissions from ruminant livestock, with the majority allocated to eco-schemes and agri-environment-climate interventions (*see Table 10:*). As a proportion of the total CSP budget in Member States, this remains minimal – between 0.1% and 3% (*see Table 11*).

TABLE 10:

Budget allocations for interventions with a potential indirect impact on reducing livestock emissions

(in Million Euros)

	BE-Flanders	ES	FR	HU	PL	Total
Eco-scheme	€ 26	€ 1,095	€ -	€ -	€ 1,270	€ 2,392
ENVCLIM	€ 47.9	€ 1,177	€ 1,650	€ 1,231	€ 23.2	€ 4,129
INVEST	€ 14.6	€ -	€ -	€ -	€ -	€ 14.6
CIS	€ 83.6	€ -	€ 91.2	€ 132.7	€ 410.9	€ 718.4
Total	€ 172.2	€ 2,123	€ 1,741	€ 1,364	€ 1,704	€ 7,253

TABLE 11:

Percentage of the total CSP budget committed to interventions with a potential Indirect effect on livestock emissions

(total public expenditure)

	BE-Flanders	ES	FR	HU	PL
Eco-scheme	0.1%	2.4%	0.0%	0.0%	2.8%
ENVCLIM	0.1%	2.2%	3.0%	2.3%	0.0%
INVEST	0.0%	0.0%	0.0%	0.0%	0.0%
CIS	0.4%	0.0%	0.4%	0.6%	1.8%

As highlighted above, the 2023-27 CAP gives Member States considerable flexibility in the design of their CSPs. Both France and Spain have no eco-schemes or ENVCLIM interventions focused directly on reducing livestock emissions. However, both countries have made policy design choices to address livestock emissions through indirect support, disincentives and using tools outside of the CAP. The strategic choices made are described below, based on interviews with advisers and policy experts close to the Spanish and French CSPs.

5.4.1 Strategic shifts in Spain's CSP: Balancing budget constraints and livestock sustainability

In Spain, the design of the CSP was guided by three overarching considerations: 1) how to make the most of a reduced budget in real terms, 2) how to divide responsibilities between the national government and regional authorities, and 3) how to address the contrasting dynamics within the livestock sector. While intensive sectors such as pigs and dairy continued to grow in production intensity, extensive systems faced a decline in both farmer numbers and average farm income.

To address these challenges, several key principles shaped the design of the CSP in relation to livestock systems. Support was directed toward extensive systems, including the introduction of minimum and maximum stocking rates within eco-schemes. Coupled support was used to offset income losses resulting from the continued convergence of direct payment rates to a smaller number of regions, with modelling indicating that dairy farms would be more negatively impacted than beef or sheep farms[27]. Furthermore, regional governments were given the responsibility and flexibility to tailor the rural development interventions[28] to specific needs, such as emission reduction measures through dietary adjustments or support for manure storage infrastructure.

Although investment aid is available in a number of regions with the aim of reducing livestock emissions (*see Spanish example in section 5.3.3*), the overall CSP framework introduces changes which have modified the way that livestock farms can access funding. These include a reduction in support for intensive systems while maintaining or increasing support for extensive systems. For example, in the previous programming period, all dairy farmers received full direct payments, including basic income support, coupled support, and greening payments. Under the new CSP however, with the greening payments having been largely subsumed into conditionality, those with the highest stocking densities are no longer eligible for eco-scheme payments unless they meet specific criteria, such as ensuring part-time outdoor grazing accompanied by appropriate documentation. Additionally, coupled support has been reoriented to further favour extensive livestock systems, reinforcing the CSP's broader strategic shift toward more sustainable and regionally adapted agricultural practices.

5.4.2 **France's indirect and voluntary approach to reducing livestock emissions outside of the CAP**

Interviews with French stakeholders revealed two main reasons for the omission of specific interventions targeting livestock emissions within the CSP. First, the rationale behind the design of CAP support in France is to ensure broad accessibility across the majority of farms. Second, the preference for an holistic strategy for addressing greenhouse gas emissions, prioritising reductions in overall farm-level carbon footprints rather than focusing solely on methane or nitrous oxide.

This broader approach encompasses not only livestock emissions, but also carbon removals and efforts to reduce dependency on imported feed through increased protein crop production. Given France's diverse agricultural landscape—ranging from mountainous and mixed systems to intensive operations—the emission reduction measures required differ considerably across farm types and local conditions.

The CAP2er tool[29], adapted for both livestock and crop systems, is the most commonly used method for calculating farm-level carbon footprints. However, actions to reduce emissions are not driven by CAP incentives (with the exception of one potentially relevant results-based agri-environment-climate measure supporting agroecological transitions – *see section 5.4.3 below*). Instead, France relies on voluntary farmer participation, incentivised by supply chain incentives. Companies along the value chain such as Danone and Nestlé offer price premiums contingent on carbon-footprint assessments and subsequent mitigation actions. This approach has seen greatest uptake in the dairy sector, with more limited engagement in beef, sheep, and goat production. The most frequent mitigation action involves improving herd management by reducing the number of unproductive animals (interview, advisory body).

5.4.3 **'Transition of practices' intervention in France: flat rate, results-based agri-environment-climate scheme**

Intervention 70.27 is a broad-based results-based agri-environmental measure available in mainland France aimed at supporting farms in transitioning toward more sustainable practices over a five-year period. It is not exclusively focused on livestock but encompasses three optional pathways: plant health strategy, farm carbon balance, and protein autonomy in livestock systems. Among these, the farm carbon balance pathway directly aims to support farms in transitioning towards a greater use of practices that reduce GHG emissions by focussing on reducing the farm's carbon footprint. This could include practices to maintain and sequester carbon as well as reducing livestock emissions. The protein autonomy option has the potential to address livestock emissions indirectly by encouraging the sourcing of local feed and reduced reliance on imported protein.

The intervention is available to all types of farms, including both livestock and non-livestock holdings, across all French mainland regions, although each region may selectively activate specific thematic areas and define region-specific implementation rules. However, those that are already committed to other agri-environment-climate interventions and/or receiving support under organic conversion schemes are not eligible to avoid the risk of double funding. More detailed eligibility rules can be set by each region. For example, in Bourgogne-Franche-Comté, farmers who have already completed a Level 1 Cap'2ER diagnostic under the AgriCarbone programme (coordinated by the Chambers of Agriculture) may still qualify, while young farmers who have received support for a carbon tool like 'Bon Bilan Carbone' might be excluded.

The intervention is designed to support agroecological transitions at farm level through a flexible, results-based framework. It is centred around a step-by-step, customised approach that helps guide farmers from an initial state (ascertained through an initial environmental diagnosis) to a more sustainable condition (evaluated through a further assessment at the end of the project). Regions may specify the formal diagnostic tool that should be used. For example, in Brittany, it is specified that the two assessments have to be carried out with the Level 2 Cap'2ER methodology, with a certified operator. An action plan, based on the initial assessment, must be development within six months of entering the scheme. This plan may include recommendations for changes in farm practices, investments, and training, and the farmer is required to document progress in a logbook throughout the duration of the project. Payments are linked to actual progress made, based on the achievement of results.

The core design requires measurable improvements over five years, with a 15% improvement in the carbon balance over the five years being required to receive the full payment under the carbon pathway. Full payment consists of a flat-rate payment of €18,000 per farm, in the majority of regions. The payment is typically disbursed either as an annual payment or as split payments with one or two advances followed by a final balance. The final balance may be a reduced amount if the target has not been fully achieved. The exact amounts and payment schedules are defined in regional implementation documents. This intervention can also benefit from enhanced payments through HSIGC (High Support for Investments Generating Climate Services), depending on regional decisions and the nature of the actions.

Examples of regional payment rules:

- **Bourgogne-Franche-Comté**[30] offers a flat-rate grant of €18,000 over a 5-year commitment. Payments are made in two payments of 50% each: the first after submitting a positive farm diagnostic and the second at the end of the engagement period. The final payment is proportional to the achievement of the target: If less than 50% of the objective is met, the full aid must be repaid and if more than 50% is met, payment is proportional to the level achieved (e.g., 80% target met equals 80% payment). Exceptions are made in cases of force majeure or exceptional circumstances.
- **Nouvelle-Aquitaine**[31] also offers a flat-rate amount of €18,000 over 5 years. If the 15% improvement in carbon balance is not fully achieved, a tolerance down to 10% improvement is accepted. The final payment will be reduced accordingly based on the actual improvement achieved, as specified in the project call documents.
- **Auvergne Rhone-Alpes**[32] offers a flat-rate amount of €18,000 over 5 years. If the emissions reduction meets less than 60% of the objective, the full aid must be repaid. Between 60 and 80%, half of the sum is paid. Above 80%, the payment is proportional to the objective met.
- **Bretagne**[33] offers a flat-rate amount of €18,000 over 5 years. The payment is made annually (€3,600 per year) and subject to the same penalty grid as Auvergne Rhone Alpes. The intervention is compatible with the "Agri Bas carbone" scheme.

The target uptake for the intervention is set at 5.2% of French agricultural holdings to be participating in the scheme by the end of the programming period, with the output indicator identifying that over the 2023-29 period, there would be 7,902 farms signed up to the intervention (Catalogue of CAP interventions). However, data show that uptake to date is limited. As of May 2025, only 47 applications for the carbon-pathway element had been submitted in Auvergne Rhône-Alpes, with just 15% of the region's total intervention (70.27) budget (across all three themes) used by the end of 2024. In Bourgogne Franche-Comté, only eight applications for the carbon pathway were submitted in 2023–2024, and just 14 in total for the entire measure, compared to a regional target of over 650. Nouvelle-Aquitaine saw 20 carbon-related applications in 2023, versus an annual target of nearly 200. In regions like Bretagne and Centre Val-de-Loire, 2024 was the first year in which farmers could apply for the carbon pathway, and no data on applications are yet available. Other regions such as Grand Est, Hauts-de-France, and Normandie have not yet reported specific uptake figures (Adviser Interview).

A key barrier to adoption seems to be farmers' reluctance to risk non-compliance with the 15% carbon improvement target and the potential need to pay back part of the payment if the 15% target is not met. Additionally, the flat-rate payment of €18,000 over five years is seen as relatively low by beneficiaries especially when weighed against the risk of potentially not receiving the full payment if the targets are not met (interviews with advisers). Moreover, the scheme does not allow double funding with similar agri-environmental schemes, which further narrows its appeal (study interviews with advisers and regional documents – footnoted above).

The primary result indicator for intervention 70.27 ("Transition des pratiques, pathway carbon balance) is R16: Investments linked to climate, although it is not possible to identify the value of the target for this result indicator that is allocated to this intervention. The total public expenditure for the whole intervention is 135 295 731 EUR.

CHAPTER 6

KEY CHALLENGES FOR FARMERS AND MANAGING AUTHORITIES

The previous chapter identified a very limited number of interventions currently in place that directly influence the reduction of livestock emissions. Even where interventions are in place, uptake by farmers is low. To understand better the reasons for this, this chapter examines the main challenges facing Member States for putting in place measures with positive impacts and the barriers for farmers adopting them in practice. It also considers what enabling factors could be put in place to improve the situation.

6.1 Key challenges for national managing authorities designing effective CAP interventions for reducing livestock emission

Managing authorities in the EU Member States face several challenges to design and implement CAP interventions that effectively mitigate greenhouse gas emissions from livestock production. These challenges arise from a combination of varying mitigation potentials, cultural resistance, and governance constraints and will be discussed in the following paragraphs.

A central issue is the varying and context-dependent mitigation potential of technical solutions aimed at reducing emissions from livestock systems. While several promising technologies exist—such as feed additives to reduce enteric methane emissions—their overall effectiveness is context-dependent, making it difficult for managing authorities to justify large-scale adoption within the CAP framework.

As a result, knowledge about viable mitigation options remains limited among policymakers and managing authorities while the latter reports difficulties in identifying appropriate technological measures that both align with CAP requirements and contribute meaningfully to emission reductions. For instance, a managing authority in Belgium-Flanders noted that the implementation of a feed management interventions was the only livestock mitigation option they could translate into a CAP measure (Interview, BE-FL). Similarly, an official in Poland stated that it was difficult for them to design a feed management measure that reduces enteric methane emissions through the CAP Strategic Plan (Interview, PL).

In addition, there is limited institutional capacity for managing authorities to support and sustain transition pathways. Especially in central eastern European countries this is repeatedly being reported by the publication of Frelih-Larsen et al. 2024. In Hungary, for example, delays in intervention rollouts due to programming period overlaps have impeded progress. Concretely, an investment measure aimed at reducing ammonia emissions was planned and budgeted but had not yet been launched because activities from the previous funding period had not concluded (Interview, HU authority). This delay reflects a broader issue of programming rigidity that limits responsiveness by authorities to emerging priorities.

Structural challenges in the livestock sector are difficult to halt or reverse through national CAP policy design. CAP support and market-driven strategies have contributed to both sectoral and territorial specialisation in farming, driving structural changes that undermine on-farm autonomy and flexibility (Ryschawy et al., 2019). These structural shifts, once established, are difficult to reverse through policy intervention alone. Territorial specialisation—particularly the spatial separation of crop and livestock production—further hampers the development of integrated and circular agricultural systems at the local level (Haut Conseil pour le Climat, 2024).

The low social acceptability and questions around the efficiency of technological interventions—especially feed additives—presents an additional barrier. This comes along with food safety concerns associated with feed additives that have been raised by managing authorities in Poland and France, further complicating efforts to promote these technologies (Interview PL/FR). Even when scientifically sound solutions are available, cultural perceptions and farmer scepticism can deter uptake. This reluctance makes it challenging for managing authorities to design CAP interventions that include such measures, despite their potential benefits (Interview FR/PL).

The implementation of livestock-related measures within the CAP is further hindered by bureaucratic hurdles. The “one-year rule” is a case in point: if the planned budget of an Eco-scheme is underutilised, Member States must return the unspent funds to the European Commission. Conversely, overbooking leads to lower payment rates for applicants, rendering the intervention less attractive and reducing uptake. Moreover, administrative requirements imposed by the EU Commission limit the design flexibility of CAP measures. For instance, Eco-schemes and agri-environment-climate measures (AECMs) may only offer payments per hectare or livestock unit, while payments per kilogram of feed additive used—are not permitted. This restriction creates excessive bureaucratic burdens for both farmers and managing authorities, who must verify quantities used without a straightforward mechanism in place (Interview PL/BE-FL).

Gaps in impact assessment undermine evidence-based design of CSP interventions. Despite GHG emissions being a declared policy priority, Hungary does not currently conduct separate impact assessments for livestock interventions. Evaluations are only planned for 2025–2026, creating a lag in evidence-based planning and reducing opportunities for timely course correction (Interview, HU).

Governance and responsibilities for different CAP interventions remain fragmented both at EU-level and MS level. Both in Hungary and France the institutional silos that may impede integrated climate action were problematized. In Hungary the managing authority mentioned that they could only speak to rural development and investment measures, while separate teams manage direct payments (Interview HU). In France the responsibility for climate goals sits with the Environment Ministry, while the responsibility for the CAP is with the Agriculture Ministry leading to a lack of coordination between the two. Specifically, recommendations from ecological planning authorities[34] were not fully integrated into explicit measures in the CSP (Haut Conseil pour le Climat, 2024; Cour des Comptes, 2023)[35].

6.2 Key challenges for farmers implementing measures for reducing livestock emissions

Farmers and land managers in the EU face several challenges to implement farm measures that effectively mitigate greenhouse gas emissions from livestock production. These challenges arise from a combination of economic and financial considerations, structural risks, awareness and knowledge, administrative and agronomic capacity, cultural and social dynamics, technical limitations, existing market structures and competing investment demands and will be discussed in detail in the following paragraphs. Some of these challenges are driven by underlying factors in the livestock sector characterized in chapter 3.

Economic viability and financial security remain a critical determinant for farmers considering the adoption of climate mitigation measures in livestock production. Clear economic advantages and a cost/benefit balance are detrimental for farmers before making far-reaching management decisions. While certain actions—such as those that improve animal health, reducing feed costs, minimising nitrogen excretion—may indirectly enhance income by increasing productivity (e.g., higher milk yields) or reducing costs (Eory et al., 2024), not all mitigation practices directly deliver such co-benefits. Where economic benefits are delayed, uncertain, or carry risks, farmers often remain unwilling to make changes, even when financial incentives are provided (Martineau et al., 2016).

Financial insecurity—driven by volatile market prices, high levels of debt, and substantial upfront investment costs—limits farmers' willingness to engage with new technologies or practices that could reduce emissions (Adam et al., 2024). Especially livestock feeding or housing techniques entail significant up-front investment and ongoing implementation costs. Farmers may also face opportunity costs, such as reduced yields or foregone revenue in the early years of transition, which further discourage adoption (Haut Conseil pour le Climat, 2024). Administrative and informational transaction costs compound these economic barriers. Farmers frequently spend considerable time and resources on learning new techniques, gathering necessary data, and navigating increasingly complex compliance requirements. In some cases, these transaction costs can match or even exceed the cost of implementing the climate mitigation measures themselves (Haut Conseil pour le Climat, 2024). Non-adopters of emissions-reducing livestock measures consistently cite high costs, low anticipated returns, and small farm size as the primary deterrents (Eory et al., 2024). When operating under these economic and financial uncertainty, many farmers prioritise short-term financial survival over long-term environmental goals.

In France, the setting of targets for the carbon footprint elements of the results-based scheme for the 'transition of practices' (70.27) is an issue (*see section 5.4.3*). Farmers have to reach a 15% reduction in their carbon footprint over the five years of their agreement, which many farmers consider to be too demanding and risky given that the full payment would not be received if the target is not met (FR interviews).

Structural change and associated risks for farmers can hinder the adoption of greenhouse gas mitigation practices in the livestock sector. As herd sizes are reduced in line with climate targets (*see secton 3.1*), capital-intensive livestock buildings risks becoming obsolete, or over dimensioned, in which there is a mismatch between a building's capacity and the reduced number of animals. These stranded assets represent substantial sunk costs and could generate significant financial losses, both at the farm level and nationally (I4CE, 2023; Cour des Comptes, 2023). Estimates suggest that such infrastructure-related risks may amount to several hundred million euros annually over the coming decade (I4CE, 2023).

In Hungary, structural changes in the livestock sector over the past three decades have led to a marked decline and concentration of animal husbandry, disproportionately affecting small and family farms (*see also section 3.1.1*). Younger farmers face multiple, intersecting challenges—including restricted access to land, capital, and labour—alongside increasing input costs and the growing prevalence of animal diseases. These systemic pressures have contributed to the abandonment of smaller farms and the erosion of rural communities (Farkas et al., 2023).

In France one of the most popular livestock actions promoted to reduce farms' carbon footprint is to reduce the number of unproductive heifers. However, there are concerns that this may lead to a lack of availability of heifers in the future, particularly in light of new diseases appearing for sheep and cattle (e.g. Bluetongue – FCO-3) leading to mortality and reproductive problems. This nervousness about reducing livestock numbers is exacerbated by the fact that farmers in France were faced with a lack of heifers a decade ago and do not want to repeat this situation.

A persistent barrier to reducing greenhouse gas emissions in livestock production is the limited awareness and understanding of available mitigation strategies among farmers. Despite the progressive development of measures such as methane-reducing feed strategies, integrated nutrient cycling, and low-emission manure management techniques, many farmers remain unaware that these options exist (Eory et al., 2024; Haut Conseil pour le Climat, 2024) (*see also Ch. 4*, describing options for reducing livestock emissions). Even when such practices are known, technical unfamiliarity and insufficient training reduce the likelihood of successful adoption (Haut Conseil pour le Climat, 2024, Martineau et al., 2016).

In France, there is also an issue for the advisory services in keeping up to date with technological advancements. The degree to which different advisers have sufficiently up to date knowledge to pass on to farmers varies significantly (French interview).

In Spain, this knowledge gap significantly constrains the uptake of sustainable practices. Farmers often lack access to clear, accessible information about emissions-reduction strategies, the risks associated with current practices, and the benefits of adopting more sustainable alternatives (Kipling et al., 2019). Moreover, Spanish farmers express a consistent preference for independent, non-commercial advice. Trust in commercial sources—such as product sales representatives—is limited, with many perceiving such guidance as biased or manipulative, which reduces the effectiveness of outreach efforts (Kipling et al., 2019).

The transferability of mitigation strategies across regions also presents challenges. For instance, Hungary has adopted GHG monitoring models and feeding strategies developed in Western-European countries such as the Netherlands. However, these imported approaches may not align with Hungary's unique climatic and agricultural conditions (HU advisor interview).

Efforts to reduce greenhouse gas emissions in livestock systems often hinge on the administrative and agronomic capacity of farms to implement change effectively. For many farmers—particularly those operating smaller holdings—limited administrative resources present a serious constraint. For example, equipment lead times require orders to be placed well in advance of the manure spreading season. Planning this far ahead can be particularly challenging for farms with minimal administrative capacity (Ademe, 2017).

Beyond procurement logistics, agronomic timing and labour capacity present additional challenges. The effective deployment of spreading technologies must align with a narrow operational window dictated by field accessibility, national nitrate protection regulations, and crop nutrient requirements. This window can be further restricted by weather conditions, particularly in regions with high rainfall or variable climates. Many farms also face staff shortages during these periods, compounding the difficulty of timely application (Ademe, 2017).

The adoption of new technologies or infrastructure—such as digesters or slurry pits—introduces further demands. These installations often require farmers to take on new technical tasks and navigate additional administrative procedures. While some farms may respond by hiring additional labour, unanticipated or poorly managed changes can become an overwhelming burden (Laboubée et al., 2020).

The limited administrative and agronomic capacity of farms, particularly those operating within crop-livestock systems, often result into a perceived loss of decision-making autonomy (Ryschawy et al., 2019). This concern is heightened by the increasing complexity of modern farming systems, which demand continuous learning and up-to-date technical knowledge with relation to regulatory compliance, climate adaptation and technical expertise (Haut Conseil pour le Climat, 2024). Farmers need time and space to adjust to new approaches and new incentives to weigh up the implications for their farming businesses and assess the risks and benefits (FR interviews).

Cultural and social dynamics play a crucial yet often overlooked role in shaping farmers' willingness and capacity to engage in climate mitigation. A key issue raised is, that farmers commonly feel that the value of their work is not adequately recognised, particularly in relation to the labour-intensive nature of agricultural production. This perceived undervaluation undermines motivation to take on additional responsibilities (Adam et al., 2024), such as implementing low emission livestock systems, that are not clearly rewarded or appreciated by the market or society. For example, in Spain, extensive livestock farming is often associated with demanding time commitments and a reduced quality of life. These conditions have contributed to declining interest among younger generations and pose a significant barrier to generational renewal in the sector (Bertolozzi-Caredio et al., 2020) also described in chapter 3.3.2.

There is variability in farmer engagement with technological solutions. Not all farmers, particularly older individuals or those operating in more traditional, extensive systems with limited structural change, are inclined to adopt or invest in technical improvements (Interview France). Therefore, the aging farm society (*see Ch. 3.3.2*) could become a driver of resistance to change and feelings of overload.

In Spain, farmers' perceptions of declining public and governmental support for livestock farming influenced the CSP's development, while the sector felt its legitimacy was under threat, prompting strong resistance to proposed measures—despite evidence of productivity gains in intensive systems and stagnation in extensive ones (Interview Spain).

Policy and regulatory frameworks are intended to support sustainable farming practices, but often present significant barriers to the adoption of livestock emission reduction measures. Administrative complexity and regulatory burdens consume valuable time and energy that could otherwise be directed toward innovation. Farmers frequently cite dense compliance systems as a major obstacle, particularly when these systems fail to reflect the realities of managing dynamic biological processes on the ground (Adam et al., 2024). Furthermore, abrupt regulatory changes introduce instability, complicating long-term planning and reducing farmers' willingness to experiment with new, potentially beneficial techniques (Adam et al., 2024). Long-term investment planning by livestock farmers also suffers from a misalignment between the timeframes needed for infrastructural or management changes and the seven-year CAP funding cycle.

More stringent regulations—particularly without tailored support—could inadvertently discourage farmers from engaging in mitigation efforts. For instance, proposals related to stricter livestock building standards may deter adoption of GHG reduction practices among producers already struggling with compliance demands (Eory et al., 2024).

The national implementation of the CAP has further highlighted disparities across farm sizes and systems. Larger farms with greater resources are better equipped to meet new CAP requirements and take advantage of economies of scale. Smaller farms, often with limited land, financial constraints, and fewer environmental practices, struggle to participate in eco-schemes, raising concerns that current policy structures could exacerbate regional inequalities in agriculture (Kiryluk-Dryjska et al., 2022). In some cases,

the cost of complying with CAP's bureaucratic requirements matches or exceeds the value of the subsidy itself, leading many smallholders to opt out (HU advisor interview). Similarly, in Spain, the CAP is often viewed as misaligned with the needs of traditional, extensive livestock systems (Morales-Reyes et al., 2025). Additionally, while extensive sheep farms do receive subsidies, their typically low levels of modernisation limit their involvement in emissions reduction strategies (HU advisor interview).

While some technological innovations show promise for reducing greenhouse gas emissions from livestock systems, their overall impact remains constrained by a range of technical limitations. Certain technologies may offer low-cost mitigation under specific conditions, but many are still in early stages of development, or their emissions-reduction potential remains uncertain (Martineau et al., 2016; Levasseur, 2023) (*see also Ch. 4.1* on technological mitigation options).

Technological options are particularly limited for extensive grazing systems, where the logistical challenges of implementation are significant. Measures such as altering feed regimes to reduce enteric methane emissions or capturing methane for energy production from manure are often impractical in systems were animals roam freely. These approaches are more technically feasible in intensive livestock systems, where animals are housed or their movements are more easily controlled (Levasseur, 2023; FAO, 2023; Cooper et al., 2013).

In addition, farmers face technical lock-in due to proprietary equipment designs. Many manufacturers offer bundled units—such as slurry tanks paired with trailing hoses—that use brand-specific connectors. This lack of interoperability restricts flexibility, limits opportunities for equipment sharing, and raises the overall cost of adoption (Ademe, 2017).

Breed-specific technical constraints can also pose challenges. For instance, the Belgian Blue cattle breed is highly input-intensive, requiring concentrated feeding systems and veterinary interventions that are not easily compatible with low-input or agroecological strategies (Tessier et al., 2021). Such structural aspects of livestock systems significantly limit the range of feasible technical adaptations, particularly when environmental objectives are at odds with production-oriented logics.

Market structures in the livestock sector significantly shape the capacity of farmers to engage in climate mitigation efforts. A key constraint lies in farmers' economic dependence on powerful upstream and downstream actors, including feed manufacturers, processors, and large retailers. This imbalance of power reduces farmers' bargaining capacity and financial autonomy, often leaving them with limited profit margins. In such conditions, even modest investments in sustainable technologies are perceived as prohibitively risky—particularly for smaller farms (Bertrand, 2020). Further compounding this issue is the perception among farmers that upstream and downstream actors exert excessive control over pricing. Supermarkets, dairy and meat processors, and the feed industry are frequently viewed as setting prices unilaterally, fostering a sense of exploitation and deepening economic vulnerability within the farming community (Adam et al., 2024).

Farmers face multiple, often competing, investment demands arising from overlapping regulatory obligations. Requirements related to animal welfare, wastewater management, and other environmental or operational standards complicate the allocation of financial resources (Ademe, 2017). This competition for limited capital complicates strategic decision-making at the farm level and may delay or prevent the adoption of greenhouse gas reduction measures.

CHAPTER 7

MOVING TOWARDS A LIVESTOCK SECTOR WITH LOWER EMISSIONS

Livestock emission reductions should form a central element of the agriculture sector's contribution to climate neutrality at the EU level by 2050. However, despite being a major funding source for such actions, the current contribution of the CAP to livestock emission reductions is negligible. The national CAP Strategic Plans (CSPs) have significant potential to support livestock emission reductions through its various interventions. The report identified limited but interesting interventions and approaches in five Member States on reducing livestock emissions that can be built on and scaled up within the current and the upcoming CAP legislation. This chapter provides recommendations on how this might be achieved, grouping the recommendations under four headings: financial support, knowledge infrastructure, cooperative governance and the alignment of the CAP with other climate policies.

7.1 Financial support to reduce livestock emissions

Needs: Access to finance is key for the transition towards low emission livestock systems. The CAP 2023-2027 provides a range of interventions and financial resources that could be used to reduce livestock emissions however the CSPs currently use them in an extremely limited way for this purpose. Member States therefore should design and implement targeted payments that sufficiently address emissions from the livestock sector. Although intensive livestock systems may be more suitable for the implementation of technological mitigation measures, this must not be at the expense of animal welfare. In addition, attractive business cases for private sector investment into low emission livestock systems are needed addressing current challenges around standardised metrics and data, long-term nature of returns and double funding issues.

Recommendation 1: Member States should exploit the on-farm mitigation potential currently available through their CSPs, offering:

- Farm level incentives to reduce enteric methane emissions, especially through eco-schemes and agri-environment-climate interventions, but also through investment support where feasible.
- Investment support for high upfront on-farm investments for low-emission farm infrastructure such as housing, slurry covers or biogas plants for anaerobic manure digestion.

Recommendation 2: Member States should set out a clear intervention logic on how they intend to address livestock emissions in their country through their CSPs. The technological measures promoted should be backed up by scientific evidence regarding their mitigation potential. If livestock emissions are addressed outside of the CAP this should be set out in a transparent way.

Recommendation 3: Redirect coupled income support for livestock to more targeted interventions that can reduce livestock emissions and support extensive grazing systems that are also important for biodiversity. If coupled income support remains available for livestock, its use should be contingent on demonstrating that the funding is used to reduce livestock emissions.

Recommendation 4: Mobilise private funding through business cases that create tailored financial support for farmers to reduce livestock emissions. This could involve blended finance, debt and equity models. Private investment should align with public goals and resources enhancing the CAP's capacity to catalyse livestock emission reductions.

7.2 Knowledge infrastructure for Member States and its managing authorities

Needs: National Managing Authorities play a strategic role in translating the CAP framework into targeted and effective interventions and measures. This strategic role needs to be strengthened by contextualised evidence.

Recommendation 5: To support Managing Authorities in their decision making and the design of livestock-related farming practices, the European Commission and their science centres should provide up to date and contextualised scientific evidence on the technological options available, their mitigation potential, and examples on how to design and implement specific technological solutions through CAP interventions.

7.3 Knowledge infrastructure for farmers, land managers and farm advisors

Needs: To achieve low-emission livestock farming, Member States must invest in farmer training, impartial advisory services, and accessible, user-friendly tools that integrate economic and environmental metrics. Strengthening local knowledge systems and supporting long-term business planning are essential to ensure effective, bottom-up implementation of CAP climate goals.

Recommendation 6: Introduce mandatory, farm-specific environment and climate plans—fully funded under the CAP—to strengthen the delivery of targeted, impact driven and long-term environmental payments offering opportunities for co-learning, innovation and shared problem solving. These plans would place advisory services and training at the core of the CAP, offering low-cost, practical tools.

Recommendation 7: Ensure support, access and usability to technical learning opportunities for farmers and farm advisors, which are central to successful implementation of livestock-related climate actions such as acquiring new skills or knowledge, particularly when specialised technologies or equipment are involved. For example:

- Financially support resources such as research centres, demonstration farms, Agricultural Knowledge and Innovation Systems (AKIS), and public events organised by agricultural institutions. These can provide platforms for building expertise and fostering knowledge.
- Ensure the usability of farm tools related to the reduction of livestock emissions to foster trust and uptake. Farmers are more likely to adopt user-friendly tools with clear input structures and actionable outputs. Tools that integrate economic and sustainability indicators and present results as summarised reports tend to gain greater trust and use.
- Among others, using the intervention focusing on knowledge exchange and dissemination of information (KNOW).

Recommendation 8: Support farmer networks and close cooperation between agricultural authorities, farm advisors and farmers that foster trust and community. This can be done particularly using the Cooperation (COOP) intervention.

7.4 Cooperative governance and responsibilities for different CAP interventions

Needs: Governance and responsibilities for different CAP interventions remain fragmented at Member State level resulting in the need for a cooperative governance structure.

Recommendation 9: Member States should ensure clear responsibilities and cooperation between different authorities in the interest of farmers and civil society.

7.5 Coherence between the CAP and other climate policies

Needs: A good policy mix is required to ensure the achievement of EU climate neutrality by 2050 with major contributions of the agricultural sector. As a result, this needs an alignment of policies providing public and private funding, regulations and requirements for actors along the agri-food value chain.

Recommendation 10: The European Commission should ensure the coherence of the CAP with other climate policies such as the Carbon Removals and Carbon Farming Certification (CRCF) Regulation, the Corporate Sustainability Reporting Directive (CSRD) involving agri-food value chain actors and the ongoing discussion around GHG pricing systems.

The EU's livestock sector has the potential to make a significant contribution to achieve climate neutrality in 2050. However, to do so will require a significant change in approach by Member States to focus on reducing emissions from livestock. This requires a broad set of measures, including financial incentives and business opportunities for farmers and the value chain, coherent climate policies, context-specific solutions and strengthened knowledge infrastructure for both managing authorities and farmers.

ANNEX 1

LONG LIST OF CAP INTERVENTIONS AND THEIR CATEGORISATION

This Annex sets out the long list of **CAP interventions** that were identified as potentially having a link to livestock emissions, sourced from the European Commission's Catalogue of CAP Interventions as described in Chapter 2 - Methodology. The final column sets out the category that they were asigned, based on a review of the detailed description and elgibility criteria.

MS	Intervention Code	National Interven-tion Code	Intervention Name - English	Categorisation
BE-FI	Eco-scheme	1.6	Ecologically managed grass-land	Indirect
BE-FI	Eco-scheme	1.7	Soil eco-regulation organic carbon content	Not relevant
BE-FI	Eco-scheme	1.10	Buffer strips	Not relevant
BE-FI	Eco-scheme	1.17	Adjustments to farm level feed management in cattle to re-duce greenhouse gas emis-sions (abbreviated: Feed man-agement in cattle)	Direct
BE-FI	ENVCLIM	3.10	Management agreements for the protection of fauna and flora linked to agricultural activi-ties (abbreviated: Management agreements for species protec-tion)	Indirect
BE-FI	INVEST	3.20	VLIF Innovative investments for further sustainability on farms	Indirect
BE-FI	INVEST	3.24	VLIF Productive investments for animal welfare on farms	Not relevant
ES	Eco-scheme	1PD31001801V1	Eco-Scheme "Carbon Agricul-ture and Agroecology: Exten-sive grazing, mowing and bio-diversity on wet pastures'	Indirect
ES	Eco-scheme	1PD31001802V1	Eco-Scheme 'Carbon farming and agro-ecology: extensive grazing, mowing and biodiversi-ty in Mediterranean pastures'	Indirect
ES	Eco-scheme	1PD31001809V1	Eco Scheme "Agroecology: Areas of biodiversity on arable land and permanent crops"	Not relevant
ES	ENVCLIM	6501.1	Agri-environment commitments on agricultural areas (6501.1 IACS). Integrated production.	Not relevant
ES	ENVCLIM	6501.2	Agri-environment commitments on agricultural areas (6501.2 IACS). Commitments on sus-tainable crops.	Not relevant
ES	ENVCLIM	6501.8	Agri-environment commitments on agricultural areas (6501.8 IACS). Soil improvement and anti-erosion practices.	Indirect
ES	ENVCLIM	6503	Agri-environmental manage-ment commitments in organic farming	Indirect
ES	ENVCLIM	6504	Animal health and welfare commitments (6504 IACS)	Indirect

ES	ENVCLIM	6505.1	Commitments for the conserva-tion of genetic resources	Indirect
ES	ENVCLIM	6501.3	Agri-environment commitments on agricultural areas (6501.3 IACS). Commitments to pro-mote and sustainably manage pastures.	Indirect
ES	INVEST	6841.1	Aid for productive investments on agricultural holdings linked to contributing to climate change mitigation — adapta-tion, efficient use of natural resources and animal welfare	Direct
ES	INVEST	6841.2	Aid for investments in the modernisation or improvement of agricultural holdings	Not relevant
FR	ENVCLIM	70.01	Conversion aid for organic farming — CAB Hexagone	Indirect
FR	ENVCLIM	70.06	Agri-environment-climate measure for water quality and quantitative management for hexagon arable crops	Indirect
FR	ENVCLIM	70.09	Agri-environment-climate measure for the climate, animal welfare and food autonomy of hexagon farms	Indirect
FR	ENVCLIM	70.11	Agri-environment-climate measure for the creation of biodiversity-relevant coverage, in particular hexagon pollina-tors	Not relevant
FR	ENVCLIM	70.14	Agri-environment-climate measure for the sustainable maintenance of agro-ecological infrastructure	Not relevant
FR	ENVCLIM	70.27	Flat-rate MAEC "Transition of practices"	Indirect
HU	ENVCLIM	RD19_G01_AEC_70	Agricultural environmental management payments (AKG)	Indirect
HU	ENVCLIM	RD29_G12_AWC_70	Animal welfare aid in the small ruminants sector	Indirect
HU	ENVCLIM	RD33b_G17_AMR_70	Compensation payment for the fight against antimicrobial re-sistance	Indirect
HU	INVEST	RD01d_E01_FRM_73	Farm development to reduce ammonia emissions	Direct
PL	Eco-scheme	I 4.2	Eco-scheme – Carbon farming and nutrient management	Direct
PL	Eco-scheme	I 4.6	Eco-scheme – Animal welfare	Indirect
PL	ENVCLIM	I.8.9.3.	AGRI-environment-climate commitments implemented under the Agri-environment-climate measure of the Rural Development Programme 2014-2020 (RDP 2014-2020). Package 1. Sustainable agri-culture	Indirect
BE-Flanders	CIS	1.4	Coupled income support – specialised animal husbandry	Indirect
ES	CIS	1PD32001801V1	Coupled support for sustaina-ble cow's milk production	No sig impact
ES	CIS	1PD32001802V1	Coupled support for extensive beef farmers	No sig impact
ES	CIS	1PD32001803V1	Coupled support for cattle farmers fattening their own calves on the holding of birth	No sig impact
ES	CIS	1PD32001804V1	Coupled support for livestock farmers for the sustainable fattening of calves.	No sig impact
ES	CIS	1PD32001805V1	Coupled support for sheep and goat farmers producing exten-sive and semi-extensive meat	No sig impact
ES	CIS	1PD32001806V1	Coupled support for the sus-tainable production of ewe's and goat's milk.	No sig impact
ES	CIS	1PD32001807V1	Coupled support for extensive sheep and goat farmers who graze fallow land, stubble or horticultural harvest residues, including extensive and semi-extensive livestock farming without pastures at their dis-posal.	No sig impact
FR	CIS	32.01	Coupled sheep aid	Negative
FR	CIS	32.02	Coupled sheep aid to new producers	Negative

FR	CIS	32.03	Coupled goat aid	Negative
FR	CIS	32.04	Coupled bovine aid	Negative
FR	CIS	32.05	Coupled aid for calves under mother	No sig impact
FR	CIS	32.08	Coupled aid for forage leg-umes in mountain areas	Indirect
FR	CIS	32.21	Coupled aid for small ruminants (Corsica)	Negative
FR	CIS	32.22	Coupled bovine aid Corsica	Negative
HU	CIS	DP11_E10_CISS_16	Ewe premium	Negative
HU	CIS	DP12_E11_CISC_16	Suckler cow premium	Negative
HU	CIS	DP13_E12_CISM_16	Bull fattening support	Negative
HU	CIS	DP14_E13_CISD_16	Aid for the rearing of dairy cows	Negative
HU	CIS	DP15_E14_CISG_16	Aid for the production of grain protein feed crops	Indirect
HU	CIS	DP16_E15_CISP_16	Aid for the production of coarse protein forage	Indirect
PL	CIS	I 5.1.	Coupled income support for cattle	No sig impact
PL	CIS	I 5.2.	Coupled income support for young bovine animals	No sig impact
PL	CIS	I 5.3.	Coupled income support for sheep	Negative
PL	CIS	I 5.4.	Coupled income support for goats	Negative
PL	CIS	I 5.12	Coupled income support for fodder plants	Indirect
PL	CIS	I 5.13.	Coupled income support for grain legumes	Indirect

ANNEX 2

INTERVENTIONS IDENTIFIED AS HAVING A POTENTIALLY INDIRECT EFFECT ON LIVESTOCK EMISSIONS

Details of the 25 interventions with a potentially indirect effect on livestock emissions are set out in the box below.

Eco-schemes (4 interventions)

- BE-FL: Environmentally managed grassland (1.6) encouraging the less intensive management of grassland parcels
- ES: Carbon Agriculture and Agroecology: Extensive grazing, mowing and biodiversity on wet pastures' (1PD31001801V1)
- ES: Carbon farming and agro-ecology: extensive grazing, mowing and biodiversity in Mediterranean pastures (1PD31001802V1)
- PL: Animal welfare - Welfare of sows – increased living area by at least 20% (I 4.6)

Agri-environment-climate (14 interventions):

- BE-FI (1 intervention): Management agreements for the protection of fauna and flora linked to agricultural activities, including restrictions on agricultural activities and a focus on extensive grazing for biodiversity purposes (3.10)
- ES (5 interventions):
  - Commitments to promote and sustainably manage pasture (6501.3), a biodiversity focused intervention promoting extensive grazing, with possible limits on stocking densities (rules differ depending on region - some have upper limits / some require reductions in livestock density by a certain %)
  - Soil improvement and anti-erosion practices (6501.8) although its focus is on activities to reduce soil erosion on cropped areas, it does include requirements relating to the use of organic manure
  - Organic farming with a focus on irrigated fruit trees (6503) - improved manure management is highlighted specifically
  - Animal health and welfare commitments (6504) which should improve the productive capacity of livestock.
  - Conservation of genetic diversity (6505.1) with a focus on bovine native breeds under threat of extinction – these traditional breeds are likely to be more suited to extensive grazing
- FR (4 interventions):
  - Conversion aid for organic farming — CAB Hexagone (70.01)
  - Water quality and quantitative management for hexagon arable crops (70.06) - encourages more reduced use of inputs on arable land, which could include manure - although not specified
  - Climate, animal welfare and food autonomy of hexagon farms (70.09) – promotes closed nutrient cycles on farms, reduced use of concentrated feed and livestock stocking limits
  - Flat-rate MAEC "Transition of practices" (70.27) – a results-based payment with three options, one of which is reducing the farm carbon balance by 15% and another is the improvement of protein autonomy in livestock farming.
- HU (3 interventions):
  - Agricultural environmental management payments (AKG) (RD19_G01_AEC_70) one element of which includes the promotion of extensive grazing

- Animal welfare aid in the small ruminants sector (RD29_G12_AWC_70) with a focus on improvements in animal health and hygiene which should improve the productive capacity of livestock.
  - Compensation payment for the fight against antimicrobial resistance (RD33b_G17_AMR_70) to promote the responsible and sustainable use of antimicrobials, in particular antibiotics, in animal husbandry
- PL (1 intervention): Package 1. Sustainable agriculture (I 8.9.3) – although the focus is on sustainable crop production, it includes the incorporation of manure into the soil.

Investment support (1 intervention):

- BE-FL: VLIF Innovative investments for further sustainability on farms, with the aim of stimulating innovation in pure innovation and on-farm renewal and complements the regular VLIF-investment aid (3.20)

Coupled Income Support (6 interventions):

- FR, HU, PL: CIS measures focussed on protein crop production (FR, 2xHU, PL)
- PL: Support provided to farmers producing fodder crops more generally
- BE-FL: Support provided to livestock farmers who combine sustainable local beef production with efforts such as local protein supply, own roughage production and diversification and long-term grassland management

ENDNOTES

1 Figures for EU-27 from CAP Context Indicator 44: Greenhouse gas emissions from agriculture – share in total GHG emissions

2 The report states that "inventory data show a slow annual decrease of 0.7 $MtCO_2$-eq between 2005 and 2021. The latest GHG projections from Member States indicate that under existing measures the pace of emission cuts will not change by 2030 (1% compared to 2021, or an annual average reduction of 0.6 $MtCO_2$-eq)".

3 This searchable database provides an overview of all the planned interventions by Member States in their adopted CAP Strategic Plans for 2023-2027, including planned uptake, financial allocations and, for some interventions, the farm practices included. It is accessible at: https://agridata.ec.europa.eu/extensions/DashboardCapPlan/catalogue_interventions-m.html

4 A common classification system of farm practices was developed by the JRC to align the terminology used in the 28 different CSPs and facilitate the comparison and aggregation of the design of interventions supporting environmental, climate and animal welfare practices. All relevant interventions were subsequently assigned farm practice labels and these have been incorporated into the Catalogue of CAP interventions.

5 In this chapter we solely focus on the livestock types dairy, beef and small ruminants.

6 If data for Belgium-Flanders specifically don't exist, this chapter is referring to Belgium instead.

7 Farms that specialise on livestock production without any other production focus e.g. crop production, horticulture

8 Almost two-thirds of the EU's farms were less than 5 hectares (ha) in size in 2020 (Eurostat 2024).

9 In addition, the European Commission has developed four scenarios (S1, S2, S3, and Life), while the European Scientific Advisory Board on Climate Change (ESABCC) has contributed two additional scenarios: an advice-based scenario and a demand-side-focused scenario.

10 Information is based on Context Indicator 13: Employment by Economic Activity from 2022.

11 European Commission | Agri-food data portal | Analytical factsheets

12 Information is based on Context Indicator 23: Age structure of farm managers from 2020.

13 Information is based on Context Indicator 23: Age structure of farm managers from 2020.

14 European Commission | Agri-food data portal | Analytical factsheets

15 In the source the category for dairy is titled 'milk'. By 'livestock sector' we are using the category 'animal products' from the source and excluding pigs, poultry, and eggs (pigs, poultry, and eggs total; 2,54k, 26.7% of MS, 0.6% of EU.) European Commission | Agri-food data portal | Analytical factsheets

16 As set out in the CSP Regulation - Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013

17 Figures for Output Indicator O.11 (number of heads benefitting from coupled income support) compared to the total programmed expenditure for coupled income support, sourced from the Catalogue of CAP Interventions.

18 The Staff Working Documents are available for each Member State at the following link: https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans_en

19 Result Indicator 13: Share of livestock units (LU) under supported commitments to reduce emissions of greenhouse gases and/or ammonia, including manure.

20 For the purposes of the study, farming practices were assigned coefficient values representing their estimated contribution to reducing GHG emissions, expressed in kilogrammes of CO_2e per unit (hectares or other unit of measurement) per year, in comparison to a reference conventional farming practice. These values were sourced from the scientific literature.

21 The Spanish investment measure is broad in nature and includes a range of eligible activities, only a small proportion of which are related to reducing livestock emissions – see section 5.3.3

22 For example, several supporting measures mentioned in the Flemish Energy and Climate Plan are implemented through Flemish regional agencies such as VLAIO (e.g. climate scan tools and innovation support), the Vlaamse Landmaatschappij (VLM), and B3W advisory services, all of which operate with regional budgets rather than CAP funding.

23 For pig and poultry farming, which are not part of this report are also relevant:
1. Use of Best Available Techniques (BAT) for manure storage and application in intensive rearing of pig and poultry, outlined in Commission Implementing Decision (EU) 2017/302
2. Demonstrating preparedness for compliance with the Industrial Emissions Directive (IED) (Directive 2010/75/EU), which applies to large-scale pig and poultry farms and sets stricter limits for air and water pollutants.

24 “Standard output” is an EU-defined economic measure based on the average monetary value of the agriculture output, in respect to type and scale of farm production.

25 The other SOs it contributes to are: SO5 - Promote the sustainable development and efficient management of natural resources such as water, soil and air’ and SO9 - Improving the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste and animal welfare.

26 Eligible technologies are listed as: Solid-liquid separation- Composting- Solar drying- Anaerobic digestion- Nitrification-denitrification (NDN) on existing holdings- Other innovative emerging treatments or variants of consolidated treatments that have higher yields than usual, and which the DACC has assessed favourably.

27 The analytical studies that informed the design of the CSP can be found here: El Plan Estratégico de la PAC de España

28 Those funded through the European Agriculture Fund for Rural Development (EAFRD), previously known as Pillar 2.

29 Stands for Calcul Automatisé des Performances Environnementales pour des Exploitations Responsables https://idele.fr/detail-article/cap2er-guide-simplifie-de-la-methodologie-devaluation-environnementale-dune-exploitation-agricole

30 Regional Strategic Plan of BourgogneFranche-Comté (Fiches d’interventions du Plan Stratégique Régional 2023-2027 de BourgogneFranche-Comté) https://www.europe-bfc.eu/sites/bfceurope/files/2024-11/Fiches%20d%27intervention%20du%20PSN%20en%20BFC_V3.pdf

31 Regional Strategic Plan of Nouvelle Aquitaine (December 2022) https://www.europe-en-nouvelle-aquitaine.eu/sites/default/files/2023-01/20221105_PSR_V_1_1.pdf

32 Regional Strategic Plan of Auvergne Rhone Alpes (December 2022) (https://ariaaura.fr/wp-content/uploads/2023/03/PROGRAMME_FEADER_23-27_AURA_dec22.pdf)

33 Factsheet on intervention 70.27, Bretagne https://europe.bzh/aides/fiches/maec-forfaitaire-transition-des-pratiques-2025/

34 See recommendations from the Ecological Planning Secretariat (SGPE, 2024) https://concertation-strategie-energie-climat.gouv.fr/sites/default/files/2024-11/20241031%20Projet%20de%20SNBC%203%20-%20concertation%20prealable-vF.pdf

35 A recent report from the French Court of Auditors explicitly recommended that the support to future reductions in the cattle herd size was necessary to meet national GHG emissions reduction targets, including with conversion aid (Cour des Comptes, 2023). However, the SP does not consider this aspect at all.

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LIST OF FIGURES

LIST OF TABLES

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