

Report

Financing the agricultural transition: obstacles and drivers

May 2025



**INSTITUT
DE LA FINANCE
DURABLE**

PARIS EUROPLACE

INTRODUCTION

As early as May 2023, the "[Action Plan for Financing the Ecological Transition](#)" noted that the main obstacle to the emergence of ecological transition projects was not a lack of financial resources but the low economic profitability of transition projects. As part of the work of the Ecological Transition Financing Committee (CFTE), the Minister of the Economy asked the IFD to continue its work, on a sector-by-sector basis, to identify the obstacles and levers for financing the transition in priority sectors. In May 2024, the IFD published its first [report on financing the decarbonisation of buildings](#), providing an assessment of the financing of carbon renovation of buildings in order to identify obstacles and make recommendations for overcoming them. Unlike many reports on the subject, the IFD takes the perspective of project leaders (households, businesses, local authorities) to understand what is hindering the implementation of projects in their financing process.

In line with this approach and following the agricultural crisis, the Institut de la Finance Durable has begun work on a second study, this time on the agricultural sector and the financing of the agricultural transition of France's 390,000 farms (excluding fisheries). As Europe's second largest producer, national agricultural production amounted to €88.2 billion in 2022 (€388.8 billion including the entire agri-food industry) and accounts for 19% of France's greenhouse gas (GHG) emissions. French agriculture is currently threatened by several factors (climate change, international competition, generational renewal, etc.): **in order for the agricultural sector to remain an economic asset for France, the agricultural transition requires significant financial support for farmers who often do not have the capacity to achieve it on their own.**

To this end, the Institut de la Finance Durable (Institute for Sustainable Finance) conducted more than 70 hearings and set up a multi-stakeholder working group on agricultural transition (farmers, agri-food manufacturers, distributors, industry representatives, trade unions, financial actors and public authorities) to carry out this work. **More than 150 people were involved in producing this report.**

This work was carried out in several stages. The first was to define specific financing cases applicable to a farmer undergoing ecological transition. **The practical cases incorporate the challenges of reducing GHG emissions, including the development of carbon sinks, biodiversity protection and adaptation.** Three families of use cases are being studied: **the production and consumption of carbon-free energy, the transition of livestock farming, and the transition of crops.** In order to reflect the diversity of agricultural transition practices as closely as possible, they have been developed and broken down into eight sub-cases. For each case, the working group conducted an analysis of **existing financial aid and tools** (aid, financing mechanisms, etc.) to identify **obstacles** to project financing by gathering **feedback from all stakeholders.**

The aim of this work is to identify solutions for financing the agricultural transition that will enable the economic development of the agricultural sector and its adaptation to climate and environmental challenges. The **conditions for mobilising public and private financing tools are set out**, along with **concrete and consensual recommendations to promote the financing of agricultural transition. These proposals also take into account the challenges of preserving France's food sovereignty and developing the competitiveness and resilience of the agricultural sector.** This innovative work and approach will make a positive contribution to the public debate on agricultural transition.

KEARNEY

Ce rapport a été réalisé grâce au soutien et à l'appui précieux des équipes du cabinet de conseil Kearney

A WORD FROM THE PRESIDENT

"Achieving a successful ecological transition by strengthening French agriculture"

Agriculture is a key sector for France. Firstly, due to its economic impact, it is a historic pillar of the country, creating added value, but also in terms of land use planning and the preservation of this cultural capital, which is unique in the world.

However, agriculture is now considerably weakened. This is evident in the sector's continuing trade deficit, the position of French agriculture in Europe, and the irreversible decline in the number of farmers over the last several decades.

This sector must adapt quickly, on the one hand to remain competitive and, on the other, to contribute to the ecological transition, as agriculture accounts for 19% of greenhouse gas emissions in France. The sector therefore faces complex challenges: reducing its climate and environmental impact, adapting to climate change, preserving our landscapes and biodiversity while remaining productive and guaranteeing our food sovereignty.

Drawn up in close consultation with all stakeholders (agricultural sectors, public authorities, businesses, investors and financiers), the report published by the Institut de la Finance Durable (Institute for Sustainable Finance) makes a clear assessment: the investments required, whether for the modernisation of equipment or changes in practices, are massive and weigh heavily on farmers' margins. Farmers do not have the financial resources to undertake these transitions on their own. In a sector where profitability is already low, these transformations cannot take place without public support and increased assistance from the private sector, particularly the financial sector.

To address these challenges, this report proposes concrete solutions for:

- Developing tailor-made financing mechanisms, combining public and private schemes.
- Support farms in their development, regardless of their size or initial situation.
- Integrate the entire value chain so that farmers' efforts are supported by manufacturers, distributors and consumers.

I believe that the agricultural transition is an opportunity to rethink our agricultural model, strengthen its competitiveness and preserve our food sovereignty. We must act now to support these changes and build a sustainable, resilient and exemplary French agricultural sector so that tomorrow, there will still be farmers in our fields.

Yves Perrier

President of the Institute for Sustainable Finance

SUMMARY

Through this work, the Sustainable Finance Institute aims to analyse financing models for agricultural transition and provide financial solutions for all farms wishing to move towards transition. The study provides a diagnosis and proposals to facilitate the agricultural transition of all farms, regardless of their starting point and the levers chosen.

Agriculture is the second largest emitter of greenhouse gases (GHG) in France. Agriculture is one of the only sectors where CO₂ emissions represent only a minority of GHG emissions: 85% of these emissions are linked to agricultural practices themselves, methane (CH₄) emissions from livestock farming and nitrous oxide (N₂O) emissions from crops using fertilisers.

The environmental impact of agricultural practices is not limited to GHG emissions. The agricultural transition must be based on a systemic approach to the subject, where the multiplicity of issues intertwine to form an inseparable whole. The complexity of the agricultural transition thus involves multiple priorities for the sector, some of which may appear contradictory: farmers' remuneration, access to food, maintaining the competitiveness of the French agricultural sector, food and energy sovereignty, biodiversity protection, healthy food and human health, water resource management, adaptation to climate change, animal welfare, changing eating habits, etc. Although the main focus of this study is the reduction of greenhouse gases, the aim is to find synergies between the various objectives as far as possible.

In environmental terms, French and European agriculture are already relatively leaders in low-carbon production. Compared to the two other countries known for their intensive agricultural production, in terms of carbon, agricultural production in France and the EU is nearly twice as efficient as that of the United States and four to five times more efficient than that of Brazil.

The agricultural sector is a strong economic asset for French competitiveness and sovereignty. In 2022, national agricultural production amounted to €88.2 billion, representing 17.9% of the European Union's agricultural production, thus positioning France as the leading European agricultural producer. The French agri-food industry, with a turnover of €388.8 billion in 2021, contributes significantly to the national economy and positions France as the second largest producer in Europe. The agricultural trade balance is one of the only French sectors in surplus (+€10.2 billion in 2022). However, some sectors are experiencing difficulties, with declines in production and losses in market share, illustrating the need to strengthen the sector's competitiveness and resilience. The challenges of agricultural transition must be reconciled with the need to continue developing a strong French agricultural sector.

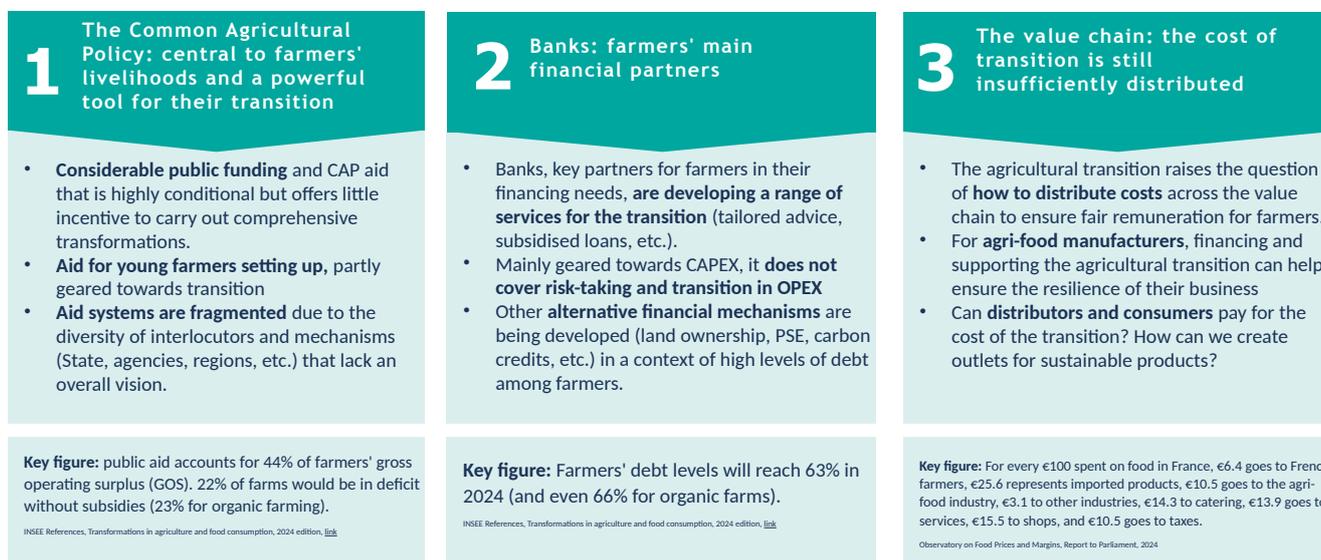
These transformations require significant investment. However, the transition in agriculture is less often a matter of large investments than of changes in practices over time, which require a transition period during which revenues may fall dramatically (the time needed for conversion, the drop in productivity linked to the reduction in inputs, greater vulnerability to climatic hazards, the time needed for learning and soil regeneration, etc.). Strong public policies, backed by reliable long-term financial partners, must therefore be at the heart of a successful agricultural transition. One difficulty in financing the agricultural transition is the relatively small size of projects and the limited financial capacity of farmers. Thus, in order for this transition to succeed, financial support must be provided to France's 390,000 farms.

DIAGNOSIS: AN INITIAL ASSESSMENT OF EXISTING LEVERS FOR FINANCING THE AGRICULTURAL TRANSITION

Agricultural financing relies on a public and financial ecosystem in which each player has a role to play. The study highlights three central pillars of agricultural transition financing: public policy; banks and financial players; and the downstream value chain.

Figure – Summary of "Diagnosis: initial assessment of existing levers for financing the agricultural transition"

Source: Institut de la finance durable



THE COMMON AGRICULTURAL POLICY: AT THE HEART OF SUPPORT FOR FARMERS AND A POWERFUL TOOL FOR THEIR TRANSITION

Public subsidies (and in particular the Common Agricultural Policy) are central to supporting farmers. This public funding is considerable. CAP aid in particular is conditional on minimum environmental standards. However, it remains an insufficient incentive for comprehensive farm transformation. Other public aid exists, particularly at national level (such as aid from Ademe, France AgriMer, the regions, etc.), which takes the form of calls for projects. The current system is complex and fragmented, and lacks the clarity needed to provide comprehensive support to farmers, both economically and ecologically, which limits the effectiveness of public spending. Nevertheless, ecological planning measures aim to improve state control over the distribution of state aid.

44%

Public aid accounts for 44% of farmers' gross operating surplus (GOS)¹. Without subsidies, 22% of farms would be in deficit (23% for organic farming)².

BANKS: FARMERS' MAIN FINANCIAL PARTNERS

Banks play a central role in financing the agricultural sector, meeting farmers' investment and cash flow needs. As farmers' primary creditors, they have a key role to play in supporting agricultural transition. **However, given the problem of farmers' high levels of debt, other alternative financial tools are being trialled and need to be studied (land portage, carbon credits, payments for ecosystem services, "transition" insurance, mutualisation, leasing, etc.).** However, these tools are struggling to gain widespread adoption and fully meet all the specific needs associated with the transition phases, which are often synonymous with uncertainty and short-term yield losses. This mismatch raises the question of diversifying financial mechanisms in order to offer support tailored to all agricultural transitions, particularly in a context of high farmer indebtedness.

63%

The debt ratio of farmers will reach 63% in 2024 (even 66% for organic farms)³.

1 INSEE References, Transformations in agriculture and food consumption, 2024 edition, [link](#)

2 Ibid.

3 INSEE References, Transformations in agriculture and food consumption, 2024 edition, [link](#)

THE VALUE CHAIN: THE COST OF TRANSITION IS STILL INSUFFICIENTLY SHARED

The feasibility of the agricultural transition depends on the equitable distribution of costs throughout the value chain, from agricultural production to the end consumer. Given the investments required to decarbonise agricultural practices, each link in the chain – producers, manufacturers, distributors and consumers – must play a role. Today, this distribution of roles needs to be better defined.

6,4€

For every €100 spent by consumers in France on food, €6.4 goes to French farmers, €25.6 represents imported products, €10.5 goes to the agri-food industry, €3.1 to other industries, €14.3 to restaurants, €13.9 goes to services, €15.5 to retailers, and €10.5 goes to taxes⁴. For example, for a litre of semi-skimmed milk sold for €0.89 in a supermarket in 2022, €0.25 went to the farmer (28%), €0.35 went to the industry (39.5%), €0.24 (27%) to the distributor and €0.05 (5.5%) to VAT⁵.

⁴ Observatory of Food Product Prices and Margins, Report to Parliament, 2024

⁵ Ibid.

RECOMMENDATIONS FOR FINANCING STRONG, RESILIENT AND SUSTAINABLE AGRICULTURE

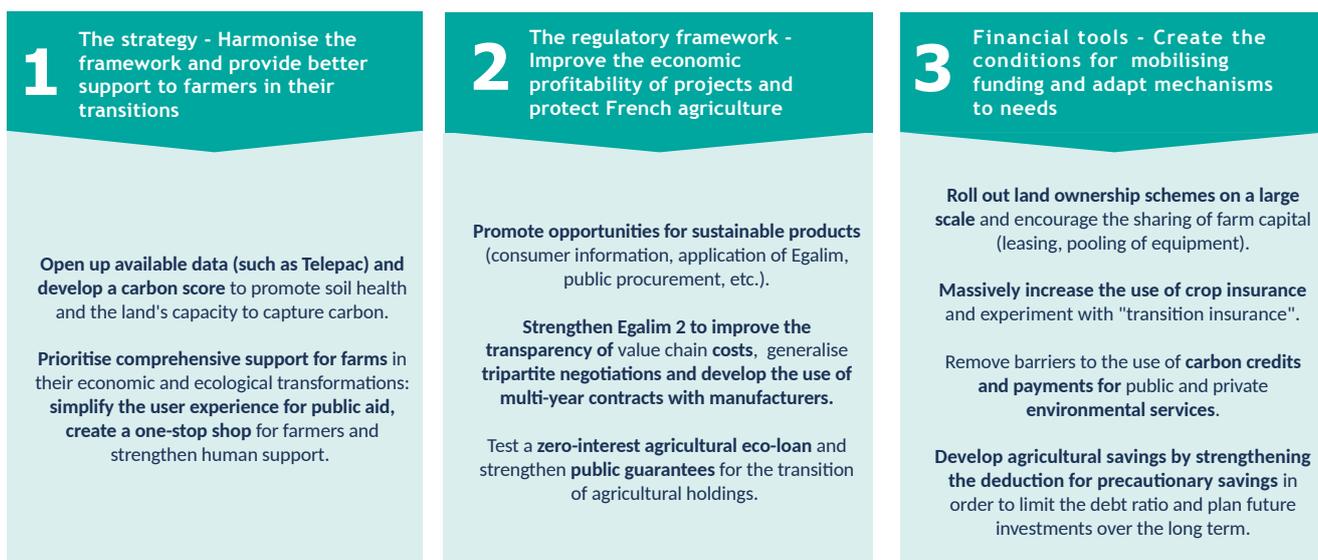
Public policy in the agricultural sector must aim to develop a strong French agricultural industry that ensures access to food and the country's food sovereignty based on a sustainable model that minimises its environmental footprint and adapts to climate change.

The recommendations presented aim to create the conditions for the economic profitability of agricultural transition projects adapted to the situations of the greatest number of farms. They were developed following the two-pronged analysis presented in the report: the diagnosis based on numerous hearings conducted as part of this work (Part II) and the case study analysis (Part III). They were thus co-developed by a working group within the IFD in close collaboration with stakeholders in the agricultural sectors.

For more details on each of the recommendations, please refer to the full report (Part IV).

Figure – Summary of key recommendations for financing strong, resilient and sustainable agriculture

Source: Institut de la finance durable



A number of prerequisites are necessary for the organisation of the agricultural and industrial sectors in order to achieve the transition objectives. First, it is crucial to define a 30-year strategic vision for the agricultural sector, incorporating clear guidelines for strong, sovereign and environmentally friendly agriculture. Next, a course must be set for the agri-food industry, which supports the agricultural sector, to accelerate energy decarbonisation. Finally, it is essential to organise the coordination of sectors for collective work.

THE STRATEGY – HARMONISE THE FRAMEWORK AND BETTER SUPPORT FARMERS IN THEIR TRANSITIONS

Harmonised assessment and valuation tools will make it possible to measure and promote environmental benefits. At the same time, it is necessary to simplify public mechanisms through a one-stop shop and a harmonised regulatory framework, as well as to provide better support for farmers in their transformations. Finally, it is imperative to strengthen initial and continuing training in order to disseminate the skills necessary for this transition.

PROPOSAL N° 1: Develop a methodological framework for accurately measuring the impact of different practices.

- On the supply side, develop a harmonised eco-carbon score for soil health and its capacity to store CO₂.
- On the demand side, an eco-score for food products is also a way to promote sustainable products.
- On the financing and insurance side, open up available data (such as Telepac) on agricultural transitions on farms.

PROPOSAL N° 2: Simplify the user journey for accessing public aid and prioritise comprehensive support for farms in their economic and ecological transformations.

PROPOSAL N° 3: Consolidate the initial training courses available and support the continuing education of farmers to keep them up to date with developments in sustainable agricultural practices.

THE REGULATORY FRAMEWORK – IMPROVE THE ECONOMIC PROFITABILITY OF TRANSITION PROJECTS AND PROTECT FRENCH AGRICULTURE

To ensure a sustainable agricultural transition, it is essential to increase the profitability of projects while reducing the economic risks borne by farmers, who currently have little financial leeway. Above all, conditions must be created to ensure that the market rewards farmers fairly for their work by working on consumer demand to support sustainable agriculture, as well as distributing the cost of the transition across the entire value chain. These measures, coupled with better protection against distortions of competition, would secure the future of the sector on a sound footing. This also requires better targeting of public aid, lower financing costs and support for risk-taking in transition investments.

PROPOSAL N° 4: Promote the creation of outlets for organic and sustainable agricultural products.

PROPOSAL N° 5: Strengthen Egalim 2 to improve cost transparency across all links in the value chain (farmers, manufacturers, distributors).

PROPOSAL N° 5 BIS: Develop the use of long-term contracts between manufacturers and farmers and strengthen the consideration of production and transition costs in contracts to better take into account agricultural production cost indicators. More specifically, strive to generalise the implementation of tripartite negotiations allowing all links in the value chain (farmers, manufacturers, distributors) to take into account changes in the cost price of agricultural raw materials.

PROPOSAL N° 6: Avoid distortions of competition and ensure consistency between environmental and trade policies.

PROPOSAL N° 7: Redirect part of the available public aid (common agricultural policy, national aid, etc.) towards incentive financing for agricultural transition.

PROPOSAL N° 8: Explore the possibility of a zero-interest eco-loan (éco-PTZ) for transition investments by farmers.

PROPOSAL N° 8 BIS: Extend the use of *Sustainability Linked Loans* to all levels of the agri-food value chain, including processing links, to encourage them to support their suppliers in their transition.

PROPOSAL N° 9: Strengthen public guarantees for investments related to the transition of agricultural holdings.

PROPOSAL N° 10: Accelerate the amortisation of industrial investments dedicated to agricultural transition: promote R&D in agricultural practices and finance the transition of the agricultural equipment and agri-food industries.

FINANCIAL TOOLS – CREATE THE CONDITIONS FOR MOBILISING FUNDING AND ADAPT FINANCIAL SUPPORT TO FARMERS' NEEDS

Finally, to accelerate the agricultural transition, a variety of financial mechanisms must be made available to farms so that each can find the ones best suited to its needs. These mechanisms must take into account the fact that, in many cases, the agricultural transition does not require significant initial investments, but rather changes in practices that impact operating expenses over a transition period of several years before they produce the desired effects. This means taking into account cash flow constraints, the risks associated with the transition and the time horizon of farmers. It is crucial to mobilise funding at all stages, to provide support during periods of transition and to coordinate the efforts of public and private actors.

PROPOSAL N° 11: Massively develop land ownership schemes where private investors temporarily take ownership of land to ease the burden on farmers and allow them to free up financial margins to focus on the transition during the installation period.

PROPOSAL N° 12: Continue to expand the use of crop insurance and adapt the system to provide incentives for changes in practice. Develop experiments for the implementation of "transition insurance" to cover the risks taken by farmers in their transitions.

PROPOSAL N° 13: Remove barriers to encourage the use of carbon credits and public and private payments for environmental services (PES) that reward farmers for achieving environmental objectives.

PROPOSAL N° 14: Develop agricultural savings by increasing the deduction for precautionary savings.

PROPOSAL N° 15: Promote soil regeneration (and non-degradation) in the price per hectare and the risk and financing model for farms.

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CONTEXT

Agriculture is the second largest emitter of greenhouse gases (GHGs) in France. Agriculture is one of the only sectors where CO₂ emissions account for only a minority of GHG emissions: 85% of these emissions are linked to agricultural practices themselves, methane (CH₄) emissions from livestock farming and nitrous oxide (N₂O) emissions from crops using fertilisers.

The environmental impact of agricultural practices is not limited to GHG emissions but also includes biodiversity conservation, water resource management and soil and carbon sink restoration, all of which have an important role to play in combating climate change. Agriculture is therefore also a solution to the environmental crisis through its ability to support the evolution of the energy mix, CO₂ capture and storage, and its role in understanding and preserving biodiversity.

This is why the challenge of agricultural transition, much more so than for other sectors, is also one of resilience in production capacities, in an approach that combines adapting practices to climate change with mitigating their impact on the environment.

The agricultural sector is a strong economic asset for French competitiveness and sovereignty. Now losing momentum and threatened by international competition, the challenges of agricultural transition must be reconciled with the need to continue developing a strong French agricultural sector.

STATE OF PLAY OF THE AGRICULTURAL TRANSITION IN FRANCE

GREENHOUSE GAS EMISSIONS FROM AGRICULTURE

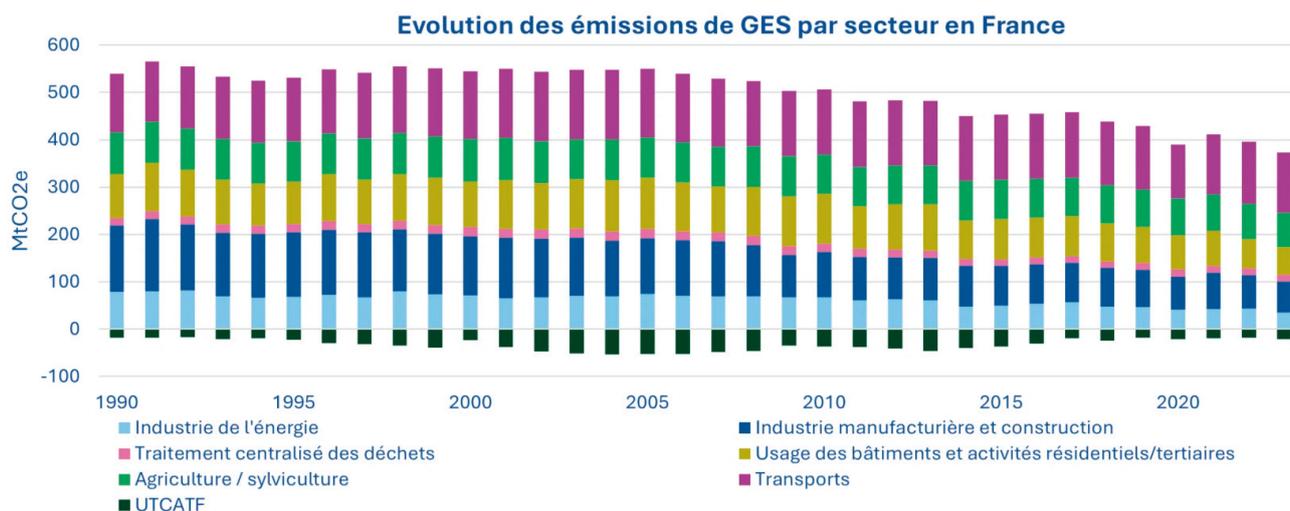
Agriculture accounted for around 19% of France's greenhouse gas emissions in 2023 (73 MtCO₂e)⁶, divided into three main components: 59.3% for livestock farming, which mainly emits methane (43.3 MtCO₂e), 38.2% for crops through the use of fertilisers such as nitrous oxide (26.7 MtCO₂e) and 13.6% for machinery and boilers that emit CO₂ through energy consumption (13.9 MtCO₂e). Thus, a significant proportion of agricultural GHG emissions are due to biological processes that remain partly unavoidable.

6 CITEPA, SECTEN Report 2024, [link](#)

Total agricultural GHG emissions are down 1.6% between 2022 and 2023 due to lower CH₄ and N₂O emissions. According to the CITEPA 2024 report: "Agricultural N₂O emissions fell by 1.6% between 2022 and 2023, with a decline in mineral fertiliser and organic inputs. CH₄ emissions fell by 1.6%, mainly due to the decline in cattle numbers and, to a lesser extent, the decline in pig numbers. CO₂ emissions from the sector will fall by 1.5%. In 2023, cattle numbers will continue to decline, albeit at a slower rate than in previous years, both for suckler cows (-1.3%) and dairy cows (-2.1%)."

Figure – Annual greenhouse gas emissions in France (MtCO₂e)

source: CITEPA-SECTEN, mainland France and overseas territories



CARBON INTENSITY OF AGRICULTURE: INTERNATIONAL COMPARISON

In order to compare the GHG emissions of French agriculture with those of other producing countries, agricultural GDP is compared with the associated GHG emissions per country. The table below compares the carbon intensity (or GHG equivalent) of some of the world's major producing countries (limited here to the EU, the United States and Brazil due to a lack of comparable data). It should be noted that this indicator is imperfect because it relates to the total production of the country in value terms. Different types of agricultural production are therefore compared without being able to accurately integrate the impact of national production choices (for example, French wine and Brazilian meat). A comparison of carbon intensity per kilogram of agricultural production (meat, milk, wheat, etc.) would provide a more accurate approach. However, these figures are currently very scarce and lack reliability due to a lack of consistency in calculation methodologies. Therefore, in the absence of comparable data for later years, the year chosen is 2020, aggregating various national sources.

Figure – International comparison of carbon intensity by country

source: Citepa⁷, Eurostat⁸, United States Environmental Protection Agency⁹, Brazilian Climate Observatory¹⁰, World Bank¹¹, IFD calculation

Country	Agricultural emissions (MtCO ₂ e 2020)	Agricultural GDP (€ billion 2020)	Carbon intensity (kgCO ₂ e/€)
France	80.9	43.7	1.85
EU-27	481.0	178.4	2.70
United States	600	139.6	4.69
Brazil	635	68.4	9.28

The high added value of French and European agriculture in terms of carbon emissions is clearly shown in the figure above. Compared to the two other countries known for their intensive agricultural production, in terms of carbon, agricultural production in France and the EU is nearly twice as efficient as that of the United States and four to five times more efficient than that of Brazil. French and European agriculture are therefore already relative leaders in low-carbon production.

THE LEVERS OF AGRICULTURAL TRANSITION

The specific feature of the agricultural sector is that the vast majority of associated emissions do not relate to carbon energy consumption, but to emissions linked to non-energy agricultural practices associated with methane (CH₄) and agricultural inputs generating nitrous oxide (N₂O) emissions. The climate impact of livestock farming and crops can therefore be explained by the multiplied effect of these gases, whose global warming potential (GWP) is much higher than that of CO₂.

7 Ministry of Agriculture, [note](#)

8 Eurstat, Greenhouse gas emissions by economic activity, 2020, [link](#)

9 United States Environmental Protection Agency, [report](#) and [focus on agriculture](#)

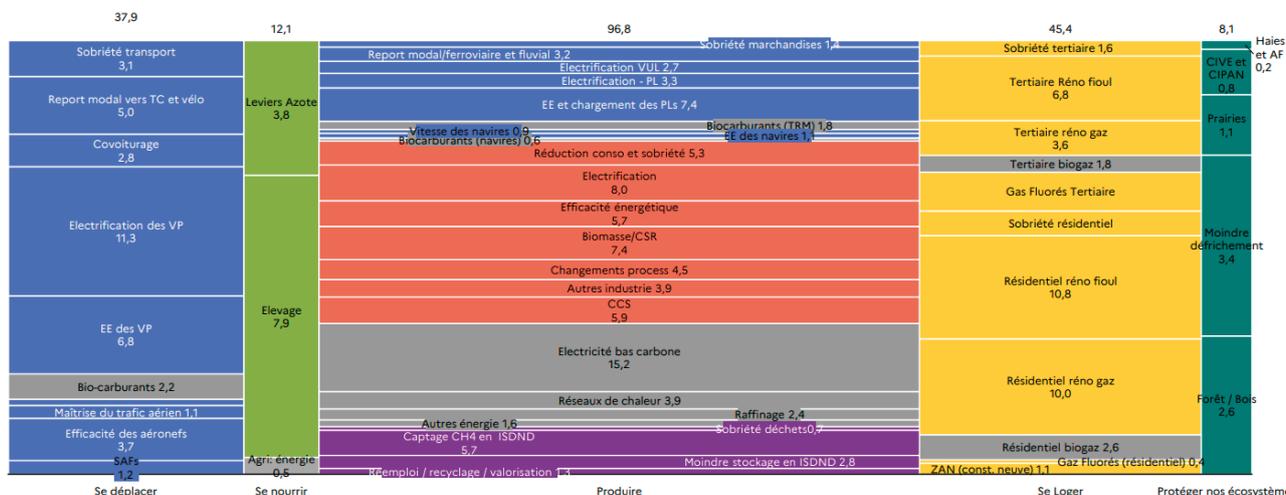
10 Climate Observatory, [AFP dispatch](#), 2020 estimate based on 2019-2022 data. The emissions included here are those from agriculture only, but the NGO has also assessed emissions linked to deforestation, which are almost double those linked to agriculture. Of the 2.35 billion tonnes of CO₂ equivalent emitted by Brazil on average between 2019 and 2022, nearly half (48%) are due to deforestation, particularly in the Amazon, with agriculture coming in second (27%).

11 Brazil's agricultural added value, [link](#)

Figure – Action plan to achieve the 2030 targets of the SNBC-3
source: SGPE

Ces 200 Mt se décomposent en 55 leviers

Chiffres bruts après hausse tendancielle – delta 2019-2030 – MtCO₂



In line with SNBC-3, the SGPE highlights a target of a 15% reduction in GHG emissions in agriculture between 2019 and 2030, from 79 MtCO₂e to 67 MtCO₂e¹². This reduction would be based on three levers: reducing input consumption (-3.8 MtCO₂e), reducing methane emissions from livestock farming (-7.9 MtCO₂e) and decarbonising agricultural machinery and boilers (-0.5 MtCO₂e).

It should be noted that beyond the strictly agricultural sphere, land use has an important role to play in combating climate change as a carbon sink in the government's projections (-8.1 MtCO₂e by 2030 according to the SGPE). There are therefore several levers for improving carbon sinks: converting grasslands, developing carbon storage techniques in agricultural soils, reducing land clearing, improving forest management, hedges and zero net artificialisation. The SGPE clearly distinguishes between planning for the agricultural sector and carbon sinks. In this study, we will focus on the agricultural sector, but the issues of land use and carbon sinks are closely linked.

This transition must involve the sectors and farms at large in order to achieve the defined objectives. For example, according to work carried out by the French Chambers of Agriculture¹³ on reference livestock farms in the Inosys networks, in order to achieve national objectives, particularly the reduction of methane emissions, 70% of French livestock farms would need to implement a range of ecological measures on their farms (development of grassland areas, better use of livestock manure, particularly as fertiliser, hedge management, replacement of Brazilian soya with French proteins, reduction in calving age, etc.).

¹² SGPE, annualised trajectory of the 2030 decarbonisation plan, May 2024, [link](#)

¹³ Hearing of the French Chambers of Agriculture with Sébastien Windsor, President, and Luc Servant, Vice-President.

MITIGATION, ADAPTATION AND BIODIVERSITY: AGRICULTURAL TRANSITION IS AN INSEPARABLE WHOLE

The agricultural transition must be based on a systemic approach to the subject, where the multiple issues are intertwined to form an inseparable whole. The complexity of the agricultural transition thus involves multiple priorities for the sector, some of which may appear contradictory: farmers' remuneration, access to food, maintaining the competitiveness of the French agricultural sector, food and energy sovereignty, biodiversity protection, healthy food and human health, water resource management, adaptation to climate change, animal welfare, changing eating habits, etc. Although the main focus of this study is the reduction of greenhouse gases, the aim is to find synergies between the various objectives as far as possible.

Fossil carbon and living carbon: biodiversity and soil health in the ecological equation

As conceptualised by Christian de Perthuis in his book *Carbone fossile, carbone vivant : Vers une nouvelle économie du climat* (Fossil Carbon, Living Carbon: Towards a New Climate Economy, published by Gallimard, 2023), a successful agricultural transition means not limiting analysis to fossil carbon emissions alone, but also incorporating living carbon, understood as biodiversity, soil health and carbon storage capacity. The exchanges between carbon in the soil, plants and the atmosphere are at the heart of natural cycles. Restoring and preserving agricultural ecosystems promotes these exchanges and contributes to soils that are richer in organic matter. This " " approach links mitigation, adaptation and biodiversity and recognises the complexity of biological cycles.

Soil health is a key indicator of the success of the transition. Sustainable agricultural practices, such as agroecology and regenerative agriculture, improve soil structure, fertility and carbon storage capacity. By incorporating this element into economic and climate analysis, it becomes possible to assess the long-term benefits for the productivity and resilience of agricultural land in the face of climate change, particularly in terms of price per hectare.

Side effects and limitations of an exclusively GHG-focused approach

A vision focused solely on GHG emissions can generate undesirable side effects. A purely GHG-based approach could encourage specialisation in the least carbon-intensive production methods, leading to the abandonment of other sectors, or favour certain regions, technologies or models that would destabilise the agricultural sector. French agriculture, which is present throughout the country with diversified production, also ensures food sovereignty, contributes to richer ecosystems, carbon storage, and the maintenance of the landscape and natural resources. Integrating these externalities into the ecological calculation is essential to avoid counterproductive decisions.

Preparing now for crop adaptation

The agricultural transition must now anticipate the impacts of climate change on crops. Adapting agricultural systems to future climatic conditions – high temperatures, water stress, extreme events, changes in pests and diseases, etc. – is a *prerequisite* for ensuring their sustainability. This adaptation needs to be planned and combined with mitigation efforts, taking into account climate, water, health and food issues while ensuring that biodiversity and healthy ecosystems are preserved (see the IPBES NEXUS 2024 report). It should be noted that several mitigation levers are also levers for adapting to climate change.

The water footprint of agricultural practices weighs heavily in the ecological equation, through the costs associated with water treatment and drought or flood management, often exacerbated by soil erosion due to poor soil health. Appropriate water management, combined with resilient agricultural practices, is essential to prepare farms for the climate challenges ahead. Integrating a variety of indicators, from soil health to water footprint, while avoiding the side effects of an overly simplistic approach, is essential to building a resilient, sustainable French agricultural sector that is fit for the 21st century.

Rethinking soil management in the face of water issues¹⁴

Climate change is intensifying extreme rainfall and summer droughts. Well-managed soils are a key solution, storing between 40 and 500 litres of water per m². This capacity depends on their porosity, created by underground life and organic matter. However, modern agricultural practices, particularly ploughing and the use of mineral fertilisers, have depleted French soils since the post-war period. Ploughing destroys the biological structure of the soil, causes it to compact and accelerates erosion. The result is limited infiltration, increased runoff and the formation of mudslides during heavy rainfall.

Faced with these challenges, it is essential to adopt practices that promote water retention and agricultural resilience. No-till farming, practised on 33% of land in North America but only 4% in France, limits soil degradation. The addition of organic matter via manure, agricultural or food waste, as well as winter cover crops, enriches the soil and sequesters carbon. Extensive livestock farming, by preserving unploughed pastures, also plays a beneficial role. Finally, agroforestry and hedge planting help improve soil porosity while combating climate change.

With this objective in mind, an educational brochure published by Ademe in 2024 as part of the Life ARTISAN programme highlights possible synergies between adaptation and biodiversity through the implementation of nature-based adaptation solutions (SafN), i.e. "*agricultural practices that, by promoting biodiversity, improve the resilience of the agricultural sector*". These actions mobilise both natural environments and resources (soil, water) and¹⁵ ous fauna and flora.

¹⁴ Read the article by Marc-André Selosse, "Faced with floods and droughts, our soils are a solution", Le Monde, 5 February 2025, [link](#)

¹⁵ ADEME, OFB (2024). Adapting to climate change in the agricultural sector: a challenge to be met with Nature-based Adaptation Solutions (SafN). 74 pages, [link](#)

Among the avenues being explored, the diversification of crops and livestock, both in terms of production and varieties/breeds and genetic resources, should increase the resilience of the agricultural sector. For example, favouring certain crops that appear to be less sensitive to global warming, such as oats and sorghum, in addition to sunflowers and rapeseed, can help to limit potential economic damage in the event of adverse weather conditions. Similarly, in grassland management, the integration of alfalfa or chicory provides both a balanced diet for cattle and greater resilience in the event of drought¹⁶.

Furthermore, in a context of increasing pressure on water resources, a major focus of the 2025-2030 programme of the water agencies is to "commit France to water sobriety", which involves stabilising agricultural water withdrawals and reducing other water withdrawals by 10% by 2030, in line with the target set by the Water Plan¹⁷ and measure 37, action 19 of the PNACC. The agencies will thus support water savings across their basins, particularly in the agricultural sector.

The PSEs, set up by the Ministry for Ecological Transition and the Water Agencies, must contribute to achieving this objective, through, among other things:

- **Protecting water quality** (reducing pesticides and fertilisers);
- **Better management of this resource**, for example by encouraging the introduction of crops that are less dependent on irrigation.

COMPETITIVENESS AND AGRICULTURAL AND FOOD SOVEREIGNTY: AN ASSET FOR FRANCE TO PRESERVE AND DEVELOP

In January and November 2024, France was the scene of large-scale agricultural protests, reflecting the sector's unease in the face of multiple challenges. Farmers expressed their concern about the signing of trade agreements, particularly with Mercosur, which could introduce unfair competition due to less stringent environmental and health standards in Latin America. These protests also highlighted recurring issues such as falling incomes, rising costs and complex regulations.

¹⁶ Hearing with Samuel Dugas, dairy farmer in Ille-et-Vilaine, representative of the Confédération Paysanne.

¹⁷ See the 2025-2030 Programme of the water agencies: [link](#)

Despite these challenges, French agriculture remains a major economic pillar. The primary mission of French agriculture is to feed the local population. In 2022, national agricultural production amounted to €88.2 billion, representing 17.9% of the European Union's agricultural production, thus positioning France as the leading European agricultural producer¹⁸. The French agri-food industry, with a turnover of €388.8 billion in 2021, contributes significantly to the national economy and positions France as the second largest European producer¹⁹. The agricultural trade balance is one of the only French sectors in surplus (+€10.2 billion in 2022).

However, some sectors are experiencing difficulties, with declines in production and losses in market share, illustrating the need to strengthen the sector's competitiveness and resilience. Here are a few examples illustrating this trend:

- **Meat and meat products:** Historically in surplus, the trade balance for this sector has been in deficit since 2015. Between 2004 and 2019, the balance fell from +€1.3 billion to – €1.3 billion, reflecting a loss of competitiveness in the face of international competition²⁰.
- **Fisheries and aquaculture products:** The trade deficit in this sector has widened over the years. In 2019, the negative balance reached – €4.6 billion, due to an increase in imports and stagnating exports²¹.
- **Fruit and vegetables:** The trade balance for this sector is also a cause for concern. In 2019, the deficit stood at – €3.6 billion, reflecting an increased dependence on imports to meet domestic demand²².

Agricultural and agri-food competitiveness and sovereignty are essential to ensuring France's food self-sufficiency and maintaining its position on international markets. This sovereignty depends not only on the ability to produce and process within the country, but also on preserving the quality of ecosystems, particularly soil and water cycles.

Linking ecological and entrepreneurial approaches

Farmers are *entrepreneurs* and key players in a rapidly changing sector. In a free enterprise environment, it is essential that they have the tools and flexibility they need to lead the agricultural transition while ensuring the economic viability of their farms. This transition requires a more entrepreneurial approach, combining innovation, income diversification and strategic risk management.

18 <https://www.insee.fr/fr/statistiques/7728839?sommaire=7728903>

19 <https://www.insee.fr/fr/statistiques/fichier/7728903/Infographies-AGRI-2024.pdf>

20 FranceAgriMer, https://www.franceagrimer.fr/fam/content/download/66953/document/20210625_Rapport%20comp%C3%A9titivit%C3%A9%202020_extrait.pdf?version=4

21 https://www.franceagrimer.fr/fam/content/download/70151/document/Performances_export_agri-cole_2021.pdf?version=1

22 <https://wikiagri.fr/articles/commerce-exterieur-agroalimentaire-a-la-fois-deficitaire-de-22-mds-de-et-excedentaire-de-32-mds-de/22722/>

Farmers must be able to invest, experiment with new models and adapt to changes in the market and societal expectations. Facilitating this approach requires a more incentive-based regulatory framework, greater access to financing and recognition of the positive externalities generated by their practices. The future of agriculture depends on its ability to combine sustainability and economic performance in a renewed entrepreneurial dynamic.

THE CHALLENGES OF FINANCING THE AGRICULTURAL TRANSITION

SIGNIFICANT INVESTMENT NEEDS IN THE AGRICULTURAL TRANSITION, NOT ONLY IN CAPEX BUT ABOVE ALL IN OPEX

These transformations require significant investment²³. Given the difficulty of quantifying the figures, there have been few recent studies on the additional gross investment needs in agriculture: the available figures vary greatly depending on the scope of the investments studied.

The Treasury has produced estimates relating solely to investments linked to the decarbonisation of energy consumption by agricultural machinery. The Treasury identifies a minimum additional requirement of around €1 billion per year for agriculture for the acquisition of new low-carbon machinery²⁴.

Beyond investments, unlike other sectors, successful transition often involves less CAPEX than OPEX, as agricultural transition is mainly based on changes in practices that impact operating costs and may temporarily reduce revenues. More broadly, in terms of the costs of environmental transition for the sector, the costs associated with changes in agricultural practices, climate uncertainty, training, research and development, investments necessary to meet non-CO₂ targets (non-energy emissions related to methane and nitrous oxide), and compensation for stranded assets, the needs for agriculture could increase to around €5 billion/year by 2050, including personnel and current consumption expenses²⁵. These amounts would increase with the raising of targets in 2030 and by 2050. Beyond the agricultural transition, the FNSEA estimates that an additional €10 billion per year in investment will be needed to revive the sector and ensure France's food sovereignty²⁶.

23 Figures taken from the report "[Action plan for financing the ecological transition](#)" (May 2023) and the update of figures by the Treasury in its article "[What investment needs for France's decarbonisation targets in 2030?](#)" (4 April 2024) written by Logan Gourmand

24 Ibid.

25 Rousseau Institute (2022)

26 FNSEA hearing with Arnaud Rousseau and Antoine Suau

It should be noted that, in terms of developing carbon sinks and forests, the investment required is estimated at €4 billion per year²⁷: €1 billion per year for maintaining and increasing carbon sinks, and €3 billion per year for forest restoration. In fact, restoring forest carbon storage capacity, which has fallen by two-thirds since the 2000s, would require up to €28 billion in gross investment alone.

DIFFICULTIES IN FINANCING PROJECTS DUE TO THEIR FRAGMENTATION AND LIMITED FINANCIAL CAPACITY.

One difficulty in financing the agricultural transition is the relatively small size of the projects and the limited financial capacity of farmers. Thus, in order to make this transition a success, financial support must be provided to France's 390,000 farms. In most cases, farmers themselves do not have the financial leeway to bear these costs and the risks associated with changing their practices. Changing models, agricultural practices or agricultural equipment requires significant investments that are often not sufficiently profitable today, even though agriculture is already one of the sectors with the lowest returns on investment (1 to 1.5% return on capital employed, which is often family capital, according to the FNSEA²⁸).

Therefore, the transition in agriculture is less often a matter of significant investment than of changes in practices over time, which require a transition period during which revenues may fall dramatically (the time needed for conversion, the drop in productivity linked to the reduction in inputs, greater vulnerability to climatic hazards, the time needed for learning and soil regeneration, etc.). Strong public policies, backed by reliable long-term financial partners, must therefore be at the heart of a successful agricultural transition.

Beyond the agricultural transition of farms, the shift must be considered in terms of vertical sectors. A successful agricultural transition requires thinking on a large scale and therefore in terms of market opportunities. The agri-food value chain, from cooperatives to distributors, as well as consumers, have an important role to play in this transition. All sectors must participate in the transition. We can think of the central role of the legume sector, which is essential for limiting fertiliser consumption and ensuring protein self-sufficiency, but which currently has no outlets and is unprofitable, or the hemp sector. However, two sectors in particular need to be addressed: the cattle sector (especially milk), due to its high methane emissions, and the arable farming sector²⁹, due to nitrous oxide emissions from the use of chemical fertilisers.

27 Trésor, "[What investment needs for France's decarbonisation targets in 2030?](#)" (4 April 2024) written by Logan Gourmand

28 FNSEA hearing with Arnaud Rousseau and Antoine Suau

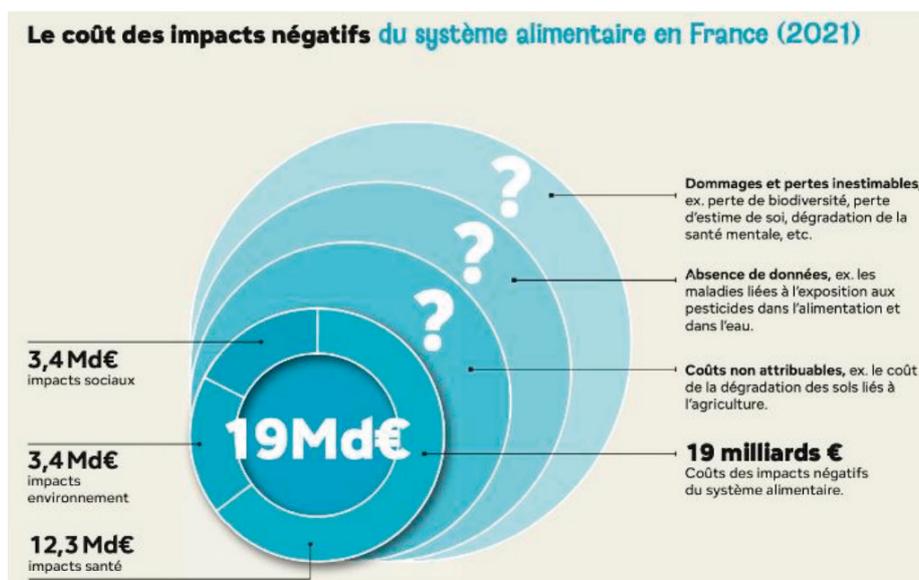
29 It should be noted that monogastric animals (poultry, pigs) consume grain: the impact of arable farming is partly attributable to these sectors.

THE "HIDDEN COSTS" OF INACTION

The financing needs associated with agricultural transition must be viewed in the context of the costs of non-transition, in terms of its impact on health, the environment and society. While agricultural and food transition comes at a cost and therefore requires financing, the impact of non-agricultural transition also has a cost: the "hidden costs" of transition. According to a recent study by Secours Catholique³⁰, these hidden costs of not transitioning the agricultural and food system are estimated at **€19 billion in repairs and compensation** for 2021, including:

- **€12.3 billion** related to the **health** impacts of our food, due to diseases such as obesity and diabetes linked to poor diet and occupational diseases (particularly the use of pesticides);
- **€3.4 billion** in costs related to **environmental impacts** due to expenditure linked to climate change, water pollution and diseases linked to air pollution;
- **€3.4 billion** in costs related to **the social impacts** of the food system, particularly through compensation for low incomes in the agricultural sector

Figure – The cost of the negative impacts of the food system in France
source: Secours Catholique, CIVAM



This **€19 billion** is a **minimum estimate** of hidden costs, to which should be added: the **costs of soil and biodiversity degradation linked to agriculture**, the impact of diseases linked to exposure to pesticides, etc., which are not quantifiable.

30 "The unfair price of our food", Secours Catholique, September 2024, [link](#)

At the global level, the FAO³¹ cites figures that are 10 times higher: "Agri-food systems generate considerable benefits for society, but also have negative impacts on economic, social and environmental sustainability. The quantified hidden costs of agri-food systems amount to approximately 10% of global gross domestic product." For France, the study estimates the hidden costs at around €160 billion per year:

- Approximately €40 billion for greenhouse gas emissions and soil pollution (including €27 billion for nitrogen emissions)
- Approximately €120 billion for health risks (processed foods, additives, diets too high in red meat, low in beneficial fatty acids, etc.)

HUMAN NEEDS FOR AGRICULTURAL TRANSITION

A crucial issue is the renewal of generations of farmers. While the agricultural transition requires additional human investment, a worrying sign for the profession is the irreversible decline in the number of farmers over the last several decades. While France had 664,000 farms in 2000 (and almost 1.2 million in 1980), it will have only 390,000 in 2022 (and around 250,000 agricultural workers). A crucial issue is therefore the renewal of generations of farmers. In Brittany, half of the 26,300 farms (12,500) are due to be transferred within the next 10 years.

Last March, France Stratégie and Dares³² published a report on Jobs in 2030. The aim of this forward-looking study is to estimate recruitment needs for each occupation, i.e. net job creation and the need to replace those leaving at the end of their careers. In the agricultural sector, the decline in employment is expected to continue, but at a slower pace. Farmers (including crop farmers, livestock farmers and foresters) will continue to lose jobs (-23,000 jobs between 2019 and 2030). As for market gardeners (including market gardeners, horticulturalists and wine-growers), their numbers are expected to increase by 1,000. The data from the baseline scenario are based on trends towards farm consolidation, a decline in labour-intensive livestock farming in favour of mechanised arable farming, productivity gains driven by innovation and increasing competitive pressure, and increased demand for food, both nationally and globally, in terms of quality and quantity. Faced with recruitment needs in agriculture and market gardening, the pool of young people entering the labour market is only 148,000. The potential imbalance between labour supply and demand is therefore 98,000 between 2019 and 2030, or an imbalance of nearly 9,000 each year. This imbalance is described as potential because it could be offset by flows from job mobility, unemployment and inactivity, as well as net migration.

31 FAO, The State of Food and Agriculture 2024, 2024, [link](#)

32 France Stratégie and DARES, Les métiers en 2030 (Jobs in 2030), 2022, [link](#)

However, the agricultural transition requires an increase in the workforce, particularly in organic and agroecological farming. According to the Shift Project, in *the French Economic Transformation Plan (2022)*, in order to carry out this transition, it is necessary to return to the levels of agricultural employment seen in the 1990s, i.e. +500,000 FTE (compared to a total of around 650,000 farmers or agricultural employees in 2022, i.e. +77%). The main labour needs stem from the need to relocate vegetable production, the widespread adoption of agroecological practices and the development of diversification activities.

With an ageing agricultural population, it is imperative to encourage new farmers to set up and offer training tailored to contemporary challenges, but also to address the issue of access to land, which is very difficult today.

FROM FARM TO FORK: THE AGRICULTURAL TRANSITION MUST INVOLVE THE ENTIRE VALUE CHAIN

THE TRANSFORMATION OF THE SECTOR AND THE FARMING MODEL: AN OPPORTUNITY TO ROLL OUT NEW PRACTICES

This transition coincides **with both a conversion challenge and a settlement challenge**. With one **in two farmers due to retire within the next 10 years**, the agricultural sector is facing a **generational renewal** challenge that raises several questions: the evolution of the farming model, **the attractiveness of the profession** to people from outside the agricultural sector, and the **practices implemented** when **new farms are set up**.

Given the **complexity of converting existing farms**, in terms of cultural, financial and skills barriers, this **generational renewal** could also be an **opportunity to respond to the need for change, as the moment when a young farmer sets up is the most conducive to investment in production equipment and changes in the farm's direction**.

THE FOOD SYSTEM VALUE CHAIN: A DRIVER OF AGRICULTURAL TRANSITION

Agricultural transition is not just about farmers, but **the transition of an entire value chain**, from manufacturers (whether upstream or downstream of agricultural production) – for whom agricultural production can represent up to 80% of scope 1, 2 and 3 emissions, including³³ – to **consumers**, via cooperatives and distribution.

A **commitment from agri-food manufacturers**, with clear incentives and adequate support for farmers, can **provide a powerful incentive for farmers**, for whom they are generally the main or even the only economic outlet, to change their practices. Long-term contracts ensuring sufficient remuneration that incorporates the cost of the transition may be a solution for certain sectors.

THE FOOD TRANSITION OF CONSUMERS, A NECESSARY CONDITION FOR AGRICULTURAL TRANSITION

Similarly, **diversifying** consumers' **diets** is a prerequisite for **creating outlets** for certain products (legumes, for example) and thus for **crop diversification**, **a central element** of **transitional agricultural practices** and soil conservation. Consumers play a key role in purchasing decisions and their willingness to pay for sustainable products.

In particular, **changing consumption patterns**, through the diversification of diets and **food waste**, will **limit the impact** of **the cost of the transition on purchasing power** and thus encourage **consumers** to **value products** from **sustainable practices**.

This report does not seek to define the physical and political objectives of the transformation of the agricultural sector in France. Much work has already been done on this subject, and the Sustainable Finance Institute is in no way qualified to comment on these issues. In particular, we can cite the recent work of the Shift Project, which, in its latest report,³⁴ presents forward-looking scenarios for French agriculture in the coming decades in response to environmental challenges. **This report begins where the forward-looking studies end: the Sustainable Finance Institute aims to analyse the financing models for this transition and provide financial solutions for all farms wishing to move towards the transition. The study provides a diagnosis and proposals to facilitate the agricultural transition of all farms, regardless of their starting point and the levers chosen.**

³³ A meat industry manufacturer detailing its carbon footprint in a hearing: 2% for the production process, 3% for employee travel, 2% for sales representatives, 2% for downstream freight, and 80% for livestock farming.

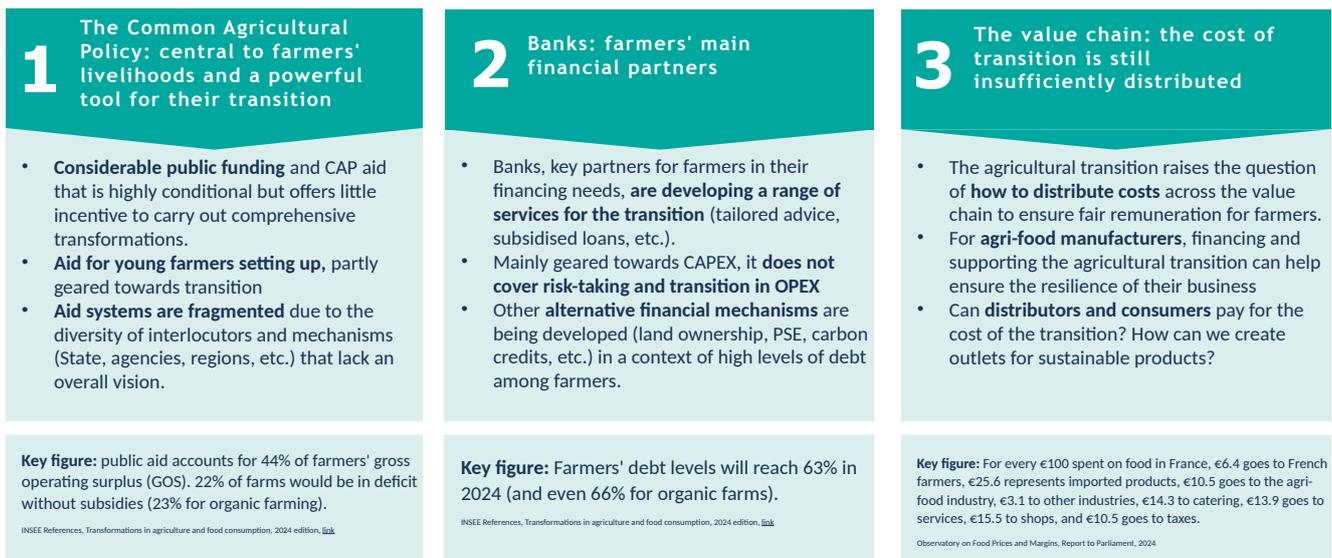
³⁴ <https://theshiftproject.org/article/pour-une-agriculture-bas-carbone-resiliente-et-prospere-the-shift-project-publie-son-rapport-final/>

02 DIAGNOSIS – AN INITIAL ASSESSMENT OF EXISTING LEVERS FOR FINANCING THE AGRICULTURAL TRANSITION

Agricultural financing relies on a public and financial ecosystem in which each player has a role to play. Public subsidies, mainly through the Common Agricultural Policy (CAP), remain essential to supporting farmers. CAP aid is now conditional on minimum standards of good practice, but its contribution to further encouraging farmers to transition remains limited. Banks, the main financial partners of farmers, offer innovative financial tools. Other alternative financial tools are being tested and need to be studied (land banking, carbon credits, payments for ecosystem services, "transition" insurance, mutualisation, leasing, etc.). Finally, the agricultural value chain, from producer to consumer, still lacks clear mechanisms for distributing the costs of the transition fairly.

Figure – Summary of "Diagnosis: initial assessment of existing levers for financing the agricultural transition"

source: Institut de la finance durable



THE COMMON AGRICULTURAL POLICY: AT THE HEART OF SUPPORT FOR FARMERS AND A POWERFUL TOOL FOR THEIR TRANSITION

Public subsidies (and in particular the Common Agricultural Policy) are central to supporting farmers. This public funding is considerable. CAP aid in particular is conditional on minimum environmental standards. However, it still provides very little incentive to carry out comprehensive transformations of farms. Other public aid exists, particularly at national level (such as aid from Ademe, France AgriMer, the regions, etc.), which takes the form of calls for projects. The current system is complex and fragmented, and lacks the clarity needed to provide comprehensive support to farmers, both economically and ecologically, which limits the effectiveness of public spending. Nevertheless, ecological planning mechanisms aim to improve state control over the distribution of state aid.

44%

Public subsidies account for 44% of farmers' gross operating surplus (GOS)³⁵. Without subsidies, 22% of farms would be in deficit (23% for organic farming)³⁶.

MASSIVE PUBLIC FUNDING FOR THE AGRICULTURAL AND FOOD SYSTEM, BUT ONLY SECONDARILY GEARED TOWARDS TRANSITION

In 2024, **public support for the agricultural and food system** amounted to **€53.6 billion**, mainly driven by³⁷:

- **France** in the form of tax and social security exemptions (€23.6 billion out of €33.4 billion in national funding)
- **The Common Agricultural Policy** financed by the EU (€8.9 billion for France out of €50 billion for the CAP at European level).
- **Local authorities** (€10.5 billion), which are mainly involved in financing collective catering but also play a significant role in supporting farmers.

With **€15.7 billion in 2024**, **agricultural production** is the **second largest beneficiary of this public support**, with **European funding** for the **CAP** accounting for **€8.9 billion**, or ~57% of support for the sector.

³⁵ INSEE References, Transformations in agriculture and food consumption, 2024 edition, [link](#)

³⁶ Ibid.

³⁷ I4CE, "Public funding of the French food system: what contribution to the ecological transition?", Paris, September 2024

France is the **leading European beneficiary** of CAP funding, which is divided into two pillars:

- **The first pillar, the EAGF** (European Agricultural Guarantee Fund), provides support to farms in the form of aid proportional to the size of the farm: on average €7 billion per year, or 75%-80% of total CAP funding.
- **The second pillar, the EAFRD** (European Agricultural Fund for Rural Development), aims to support innovation, rural development and risk management projects, co-financed by the State and local authorities. It represents approximately €2 billion per year.

According to I4CE³⁸, agricultural production is both the primary beneficiary of favourable support (47%-61% of favourable funding) and unfavourable support for the ecological transition (64% of unfavourable support). Adverse financing includes tax exemptions on energy products (non-road diesel, natural gas for farmers) and coupled aid for livestock farming based on herd size. In 2024, of the **€53.6 billion in public funding** dedicated to the agricultural and food system, **less than 10%** (between 6% and 9% – €3.2 to €5 billion) can be considered as **favourable to the ecological transition** and around **7%** can even be considered as **unfavourable³⁹**, with the majority of funding therefore having an uncertain impact.

THE TWO PILLARS OF THE CAP

The main direct aid to farms favours large farms regardless of their practices. The first pillar (approximately 80% of aid) is mainly redistributed on the basis of land area (even though this aid is conditional on minimum environmental standards), while the second pillar (approximately 20% of aid) subsidises agri-environmental and climate practices.

The first pillar of the CAP, associated with the European EAGF fund, includes decoupled and coupled direct aid, representing a budget of €6.7 billion (2023):

- **Decoupled aid**, linked to the size of the farm and independent of the type of production, constitutes income support for farmers. It accounted for €5.7 billion of the €6.7 billion direct aid budget.
- **Basic income support** (48% of decoupled aid), which aims to guarantee farmers' incomes, accounts for the largest share of CAP direct aid. The amount of aid varies according to region, with the national average in 2023 (excluding Corsica) being €127/ha.
- **Supplementary aid for young farmers** (ACJA, >2%) is a lump sum paid during the first five years after a young farmer sets up, amounting to €4,469 per farm per year.

³⁸ I4CE, "Public funding of the French food system: what contribution to the ecological transition?", Paris, September 2024

³⁹ Support for fossil fuels, support for livestock farming proportional to herd size (Favourable/Unfavourable: funding in line with national climate and environment strategies)

- **The additional redistributive aid** (10%) is allocated to the first 52 eligible hectares at a rate of €48/ha, providing additional support to small and medium-sized farms.
- **The eco-scheme** (25%) is additional direct aid for farmers who implement environmentally friendly practices (from €60/ha to €80/ha and a 'hedge' bonus of €7/ha) or practise organic farming (€110/ha)⁴⁰. Certifications also make it possible to benefit from the eco-scheme.
- **Coupled aid** (linked to the type of production) accounts for ~15% of total direct aid under the first pillar of the CAP and is intended for livestock farming and certain crops (e.g. rice, hops, small-scale market gardening, etc.) between €60 and €1,600/ha depending on the area and type of crop. In particular, they can promote the integration of certain legumes, which may be of interest in the case of crop transition (see case study 3.B.).

The first pillar is subject to cross-compliance, whereby aid is conditional on compliance with environmental standards ("Good Agricultural and Environmental Conditions of Land") and requirements relating to the environment, health (public, animal and plant) and animal welfare. These standards constitute a minimum environmental standard for receiving aid.

Unlike aid under the second pillar, aid under the first pillar is not subject to regional subsidiarity (via the managing authority of the regional councils) and is therefore uniform throughout France.

The second pillar of the CAP includes aid for conversion and the implementation of environmentally friendly practices, representing around 13% of CAP aid in 2023:

Among the aid measures under the second pillar of the CAP, dedicated to rural development, the compensatory allowance for natural handicaps (ICHN) provides financial compensation to farmers facing difficult production conditions, amounting to approximately €35-450/ha depending on the area, for a total budget of ~€1.1 billion in 2023.

In addition to the ICHN and the DJA, the second pillar of the CAP, dedicated to rural development, includes aid to support the conversion and adaptation of farms. This represents a total of around €0.9 billion in 2023:

- Agri-environmental and climate measures (AECM), managed by the State, are subsidies aimed at supporting farmers who wish to commit to implementing environmentally friendly practices in certain areas for a period of five years. These practices (specifications) and the eligible areas are defined in national specifications, adapted to the regional level, for a total budget of approximately €263 million.

⁴⁰ The theoretical remuneration announced in 2022 is shown here, but the reality differs. See the [decree](#) setting the actual amounts. This difference is due to a higher than expected proportion of farmers benefiting from the scheme (95% compared to 85%), while the total budget remains constant. It also reflects the low ambition of the eligibility criteria.

- Aid for conversion to organic farming (CAB) represents a budget of €340 million in 2023. It is intended for farmers in their first or second year of conversion who commit to a five-year programme. The amount of aid varies according to production, ranging from €44/ha/year to €900/ha/year.
- Farmers also receive support for investments related to the modernisation of their production facilities. Each region creates its own scheme based on the PSN model (e.g. AgrilInvest in Brittany). The regions are the managing authorities for all non-area-based aid under the second pillar of the CAP, which includes investment aid. The regions therefore translate the PSN measures under their management into regional schemes, which give rise to calls for projects.

AID FOR THE INSTALLATION OF YOUNG FARMERS IS ONLY VERY PARTIALLY DIRECTED TOWARDS THE TRANSITION

Aid for the establishment of farmers, including the national DJA scheme, is controlled by the regions in terms of amount and allocation. Various forms of public aid exist to support farmers, particularly when they are setting up⁴¹:

- The **Young Farmer Grant (DJA)** is direct aid co-financed by the State (20%) and the EU via the EAFRD (2nd pillar of the CAP), intended for farmers between the ages of 18 and 40 who are setting up on their own for the first time.
- The amount of the initial YAF grant varies according to the region and area, and is subject to adjustments (livestock farming, outside the family framework, significant takeover costs). In particular, **projects based on the principles of agroecology** receive an additional grant. In 2023, the **average amount** of the DJA was **€32,000** (80% paid in the first year, 20% in the fifth), which in practice only benefited one third of new farms.
- The DJA also comes with **potential tax exemptions** (100% allowance in the first year, then 50% on taxable income for five years) and **social security contributions** (partial or degressive exemptions).

Some regions **offer regional aid for setting up** in addition to the DJA, such as [non-exhaustive list]:

- In the Hauts de France region, the ARSI (Aide Régionale Spécifique à l'Installation), intended for young farmers (up to 50 years of age) who are not eligible for the DJA and whose amount varies between €9,000 and €12,000; the PRCTA loan, a 0% interest start-up loan for farmers under 50 who are not eligible for the DJA.
- In the Occitanie region, the DNA (New Farmer Grant) is intended for farmers under the age of 52 who are setting up for the first time and are not eligible for the DJA (under 40 and not eligible for the DJA or between 40 and 52).

⁴¹ National Strategic Plan for the CAP 2023-2027

COMPLEX AND FRAGMENTED AID SYSTEMS THAT HINDER COMPREHENSIVE SUPPORT FOR FARMS

In particular, this support mainly **takes** the form of **specific subsidies** (for a particular practice or piece of equipment, in the form of irregular calls for projects) **rather than a systemic transition** that goes beyond the issue of a farmer's ability to make a living from their farm. The paperwork, visits and inspections are numerous and fragmented.

As a result, **many different public institutions (Ademe, FranceAgriMer, Ministry of Agriculture, water agencies, etc.)** are responsible for managing these grants and subsidies, which can take various forms (direct aid, one-off payments, calls for projects, etc.), making them difficult **to understand and administratively complex for farmers**, and potentially leading to a **lack of consistency and control over their effectiveness** for public authorities.

The administrative complexity and multiplicity of regional subsidy schemes are hindering the agricultural transition. The implementation of an agricultural transition project makes sense at the regional level because **the region** is a major financier of initiatives related to the agricultural transition (e.g., Agri Invest in the Brittany region). A significant proportion of regional aid can be dedicated to agricultural transition, such as in the Brittany region, which distributes 70% of its agricultural aid to agroecology projects⁴². In addition, **some of Ademe's aid and calls for projects** have been defined at the regional level. ADEME operates on the principle of calls for projects, requiring different approaches to be implemented for each type of aid. For example, agricultural methanisation is no longer subsidised by ADEME in Brittany, whereas it is in other regions. Water agencies also sometimes offer payments for environmental services, but only in limited areas (see PSE section below). Finally, **the support ecosystem varies from one region to another** (such as chambers of agriculture, which operate at departmental and regional level).

The multiplicity of public support for the agricultural sector results in a lack of clarity regarding the aid available to agriculture (multiple agencies, aid programmes, etc.). This is a hindrance for farmers, but also raises questions about **the effectiveness of public spending**, for which there is no **overall oversight** of the **commitments and results of these schemes**.

The Ministry of Agriculture's ecological planning approach, implemented in 2024⁴³, is gradually responding to this demand for more efficient management of the multitude of public measures. The Ministry of Agriculture is therefore working hard to streamline and plan national measures and to coordinate the public policies of the various stakeholders involved.

42 <https://www.bretagne.bzh/actions/economie-emploi/agriculture-agroalimentaire/>

43 [Website](#) of the Ministry of Agriculture and Food Sovereignty

The MASA's 2024 budget reflected the concrete implementation of ecological planning: more than €1.2 billion in dedicated funding was allocated to France's long-term food sovereignty, to continuing the ecological transition in the agricultural and forestry sectors, and to supporting these sectors' adaptation to climate change. This budget was in addition to the funding already put in place by the ministry to support the ecological and climate transition of French agricultural, food and forestry systems.

BANKS: FARMERS' MAIN FINANCIAL PARTNERS

Banks play a central role in financing the agricultural sector, meeting farmers' investment and cash flow needs. As farmers' primary creditors, they have a key role to play in supporting the agricultural transition. While subsidised loans and new financial tools (land banking, carbon credits, payments for ecosystem services, "transition" insurance, mutualisation, leasing, etc.) offer concrete solutions for investment, they nevertheless struggle to fully meet all the specific needs associated with the transition phases, which are often synonymous with uncertainty and short-term yield losses. This mismatch raises the question of diversifying financial mechanisms in order to offer support tailored to all agricultural transitions, particularly in a context of high farmer indebtedness.

63%

The debt ratio of farmers will reach 63% in 2024 (even 66% for organic farms)⁴⁴.

BANKS: KEY PARTNERS FOR FARMERS IN THEIR FINANCING NEEDS

Banks remain the key partners for farmers in meeting their short – and long-term financing needs. With an average debt ratio per farm exceeding 63% in 2024, farmers therefore very rarely have the financial leeway to transition their farms.

Bank loans are the primary source of financing for farmers, with **€67 billion outstanding in the sector as of August 2024**⁴⁵. Three players account for almost the entire market: **Crédit Agricole** (~70% market share), **Crédit Mutuel** (~17% market share) and **Groupe BPCE** (9-12% market share).

Several banks offer subsidised loans for investments related to the transition. These are available both to farmers (see the examples of Crédit Mutuel Arkéa and Crédit Agricole) and to **players further down the value chain** (agri-food manufacturers), who are encouraged to support their producers by **offering them access to loans** (such as *Sustainability – -Linked Loans*) set up by banks. In exchange for a reduced interest rate, the issuer must meet conditions related to ESG criteria.

44 INSEE References, Transformations in agriculture and food consumption, 2024 edition, [link](#)

45 Banque de France, Business Financing Reference Framework, August 2024

Banks are experimenting with a number of tools to provide the best possible support to farmers: the example of Crédit Agricole

Crédit Agricole is developing a range of tools to provide farmers with the best possible support in the transition, both in terms of advice and financing:

- The **"Trajectoires Agri"** tool facilitates dialogue between the adviser and the customer, enabling them to better understand and guide the farmer customer with regard to their economic situation and transition strategy. Trajectoires Agri raises awareness and supports customers on issues such as energy transition, climate risks and GHG reduction/sequestration.
- **"New Agri-Environmental Practices" offer:** An offer aimed at farmers wishing to commit to an environmental approach (organic farming, high environmental value, low carbon farming, etc.). This offer, available to regional banks, includes three levels of financing: an investment loan, a cash advance and certification financing.
- **"Agilor Transition" offer:** an offer dedicated to financing equipment that supports sustainable agricultural practices, low-emission rolling stock and equipment for preventing climate hazards.

In addition to these offers, Crédit Agricole is developing more general financing activities for the agricultural sector:

- **The Carbioz platform (launched in March 2024):** a digital and human solution enabling businesses, local authorities and associations to support state-approved agricultural decarbonisation projects rooted in local communities through the acquisition of voluntary carbon credits, with co-benefits in terms of biodiversity, soil regeneration and water quality.
- **Launch of a range of investment funds** with an investment thesis focused on financing the agricultural and agri-food transition and innovation (private debt funds, private equity funds and innovation capital funds).
- **Offers its customers leasing** for agricultural equipment.

Subsidised loans for agricultural transition projects: the example of Crédit Mutuel Arkea

Subsidised loans are the primary financing tool used by banks for agricultural projects related to the transition. Financing offers dedicated to the environmental transition for farmers exist, such as Crédit Mutuel Arkea's AgriNovéo offer, a subsidised loan for green energy production. These are therefore mainly focused on energy decarbonisation issues or improving working conditions (such as the AlterAgriNovéo offer, a subsidised loan for mechanisation, building improvements, etc.).

Agricultural projects seeking access to subsidised financing are assessed on the basis of three pillars:

- "Economically viable" in terms of the investment period and the ability to make regular annual repayments
- "Humanly liveable" in terms of working time and conditions
- "Environmentally sustainable" in terms of compliance with current standards and future capacity to implement transition practices

Innovative financing methods such as leasing, equity investment or third-party financing are not particularly well developed due to **cultural barriers among farmers**.

While **banking facilities** can address **investment issues** (CAPEX) such as the purchase or financing of new equipment (new BioNGV tractor, methanisation plant, building efficiency, etc.), they **do not seem adequate for financing changes in practices that involve a transition period (usually around 3 to 7 years depending on the sector)** that may impact the production cycle (OPEX and WCR requirements).

In particular, **phases of change in practices** require a guarantee against loss of income and changes in operating costs, raising the question of **the role of third-party financial actors (such as insurers, or more generally investors) who would have the capacity to support a farmer's risk-taking**.

Financing equipment for ecological transition: the example of Banques Populaires

Faced with increasingly frequent climate events, the Banques Populaires were among the first to offer, starting in 2022, a product dedicated to **financing equipment for ecological transition**: the **Agrilismat CAPDURABLE** product.

In recent years, unpredictable weather events have intensified, causing significant direct and indirect damage to crops (frost, heavy rain, hail, drought, etc.). Although many manufacturers now offer innovative protection devices, these are often very expensive. Through the **Agrilismat CAPDURABLE** offer, Banque Populaire has selected **a list of equipment that can benefit from preferential financing conditions** in order to facilitate the transition of the agricultural world towards a more sustainable model that preserves resources and the environment and supports healthy food production.

The **financing** covers new or used agricultural equipment selected by [Banque Populaire's](#) agricultural advisers for its positive impact:

- On environmental protection,
- Protecting your crops from climatic hazards,
- Relieving farmers and employees of repetitive tasks.

The list of eligible equipment can be found online on the Banque Populaire website, and the financing application does not require any additional administrative formalities for the farmer.

Sustainability-linked loans: the example of BNP Paribas and Bonduelle ⁴⁶

For several years now, Bonduelle has been strategically reorienting its production towards vegetables. The number of flexitarians today has reached unprecedented levels and vegetable consumption in general is on the rise.

The international group, whose vegetables are distributed in nearly 100 countries with annual sales of €2.4 billion, develops **products grown using sustainable farming methods** (crop rotation to protect the soil, innovation to preserve water resources while promoting ecosystem biodiversity, decarbonisation efforts, contribution to the circular economy, etc.).

During this strategic transition, which requires continuous innovation to adapt to changing customer needs, Bonduelle has relied on BNP Paribas to **improve its financial and sustainable development objectives**.

In 2023, the partnership between Bonduelle and BNP Paribas reached a new milestone with **the amendment of its €400 million syndicated revolving credit facility (RCF)**. As Mandated Lead Arranger, BNP Paribas helped secure an essential source of financing that is particularly suited to the seasonal nature of Bonduelle's needs in this area, including through a two-year extension of the loan maturity. And as ESG coordinator, BNP Paribas helped strengthen the group's sustainability credentials by incorporating **two additional ESG indicators** into the loan: reducing its carbon footprint and contributing to regenerative agriculture with its agricultural partners – in addition to its B Corp certification, which will be completed by 2025.

⁴⁶ <https://group.bnpparibas/actualite/bonduelle-mener-la-transition-vers-l'alimentation-vegetale>

Cash advances, a form of short-term borrowing offered by **private or public entities (banks, regions, cooperatives)**, enable farmers to meet the challenges of the production cycle, which requires them to incur supply and operating costs prior to harvesting and selling their products.

NEW INNOVATIVE FINANCING SCHEMES STILL IN THE EXPERIMENTAL PHASE

Numerous financing initiatives are being developed by private and public actors, based on making access to financing conditional on the implementation of sustainable practices, in particular:

- **Agricultural land transfer mechanisms** conditional on the implementation of sustainable agricultural practices can **facilitate the establishment of new farmers** and **encourage agricultural transition**.
- **Crowdfunding** (CrowdLending, crowdfunding) makes it possible to collect or borrow funds from savers via dedicated platforms (Miimosa, Bluebees, etc.) or associations (such as Fermes en Vie, which is setting up a "rural environmental lease"). However, these schemes remain **very limited**, with **~1% of loan volumes collected and ~5% of investment funds dedicated to agriculture in 2023**⁴⁷.
- **Payments for ecosystem services** and **carbon credits** (including the Low Carbon Label), whether public or private, enable farmers to receive remuneration for implementing environmentally friendly measures.

All of these initiatives are recent and raise the issue **of monitoring the implementation of practices and the associated administrative burden**.

47 Observatory of crowdfunding in France 2023, Mazars

Focus - Land ownership as a solution for transition?

Beyond the significant constraints that currently exist on access to land, the financing of agricultural land can be a major obstacle to the establishment of farmers, but also a potential source of financing for the transition if this initial investment is postponed. Agricultural land holding facilitates the establishment of new farmers and can encourage agricultural transition.

Around **500,000 hectares** are taken over for new farms each year, with a growing proportion of so-called "non-family" farms, compared to around 100,000 hectares of land abandoned each year.

The average price of a hectare of agricultural land⁴⁸ is **€6,200/ha** in 2023, representing a **theoretical average investment of €430,000** in agricultural land (medium-sized farm, 69 ha in 2020), to which must be added the necessary investments in equipment, buildings, etc.

Nearly **52% of the usable agricultural area (2023)** is leased from third parties and farmed under sharecropping arrangements, a figure that has been steadily increasing since 1980. The vast majority of this land (around 80%) is leased by retired farmers or descendants of former farmers. This land is leased at rates regulated by departmental decrees. It generates a **gross return of around 1.5-3.5%** for the owner, depending on taxation levels (such as property tax).

The market for agricultural land leasing of "land and meadows" will exceed **€400 million** in 2023. This type of tangible, "impact" investment is seen as a diversification opportunity for investors.

Agricultural land holding is implemented by many private players and allows financing to be conditional on the implementation of sustainable practices:

→ SAFERs are key players, able to support project leaders in their land holding initiatives and put them in touch with private investors.

→ Solidarity-based land companies such as **Terres de Liens** and **Fermes en Vie** mobilise savings from "citizens" and private institutions to acquire land made available to farmers seeking to set up. Terres de Liens is the only organisation based on a model of non-repurchase of land due to a desire to "sanctuarise" land on which agroecological practices are developed. Some public land companies are also set up by certain regions, such as **Foncière Occitanie**.

→ Some banks offer the possibility of setting up land ownership for young farmers, with the option of repurchase after five years⁴⁹, with the value of the land being determined by SAFER.

→ The **Banque des Territoires** is mobilising a **€400 million fund called "Entrepreneurs du Vivant" (Entrepreneurs of Life)** to help young farmers get started. The funds will be allocated to commercial companies or impact funds as part of calls for investment projects in agricultural land, agricultural transition infrastructure, and companies carrying out such projects themselves. We can also mention the land fund created by CDC Biodiversité and the Banque des Territoires.

→ Various innovative players are making the implementation of agroecological practices a condition for the transfer of agricultural land: Printemps des Terres (private investment), Eloi (connecting farms for takeover with project leaders), etc.

48 Unleased agricultural land (Source: Safer)

49 Resale price corresponding to the market price (purchase price plus the "capital gain on free land in the area") with a reduction in capital gains depending on the number of years of ownership (50% for less than 5 years of ownership).

Two limitations to the development of agricultural land ownership:

→ The "scissor effect" on the profitability of agricultural land ownership: multiple tax measures apply to agricultural landowners, including a set of taxes that do not depend on the level of income generated by the land, such as property tax. These taxes are **not correlated with the amount of rent**, which is regulated by decree and, on average, lower than the average rent observed in other European countries. The **profitability** of agricultural land holding operations, already low compared to other investments, is **therefore particularly sensitive to increases in these taxes** and changes in rent prices.

→ *Even before financing, there is the question of land availability:* The implementation of an agricultural land holding scheme as part of a farmer's establishment requires that land be available and identified by a project leader. However, in certain regions, project leaders face competition from established farmers seeking to **expand their operations**, leading to intensification of crop and livestock production. This is compounded by **urbanisation** (~13,000 ha in 2023) and the **conversion of land away from agricultural use** (~15,000–20,000 ha/year). **The lack of regulation of access to land** means that it is not possible to **guarantee priority for new entrants over expansion** for young farmers, whose **lack of ties to the agricultural community** is already a barrier to many initiatives.

The economic model – example of Printemps des Terres:

Le Printemps des Terres, a company whose mission is to hold agricultural land, invests in agricultural land and its restoration. It leases the land to farmers on condition that they implement sustainable agricultural practices and have the right to market the associated environmental services. After five years, the farmer receives an irrevocable right to acquire the land he or she is farming.

For farmers: land management frees them from the financial "dead weight" of purchasing land and gives them financial leeway when they set up their business to define their sustainable farming model and buy back their land, if they wish, once they have found their economic model.

For investors: the return is stable and attractive (7 to 9% per annum⁵⁰) thanks to the return on the land (2 to 4% rent) and payments for environmental services (carbon credits and biodiversity), which double the profitability. Agricultural land does not lose value over time; on the contrary, the quality of the soil is enhanced.

Printemps des Terres therefore offers stable returns to its shareholders and a stable framework for farmers, enabling them to make the transition.

These limitations pose a risk to the profitability of support schemes and thus to their deployment on a national scale.

50 Spring Land Hearing

Focus - Carbon credits and Low Carbon Label

THE LOW CARBON LABEL FRAMEWORK

The Low Carbon Label is a voluntary carbon certification framework that enables the financing of low-carbon practices implemented by farmers through the sale of carbon credits as part of a carbon offset mechanism. The Low Carbon Label is a scheme launched in 2018 by the Ministry for Ecological Transition and Territorial Cohesion. Its main purpose is to facilitate the financing of greenhouse gas emission reduction projects, thereby generating additional income for agricultural and forestry stakeholders. Based on sector-specific methods approved by the Ministry, it certifies the sale of carbon credits to public and private financiers such as airlines.

This scheme saw strong growth in certified projects in 2024, with over 5 MtCO₂ awaiting certification, approximately 50% of which were agricultural projects.

Difficulties associated with the massification of carbon credits:

→ The primary difficulty is generating sufficient demand for carbon credits. There is a supply of carbon credits that cannot find buyers, particularly for French-certified carbon credits, which currently lack visibility.

→ Certification represents an additional administrative burden, which is borne by the agent (an intermediary such as Carbon&Co, a subsidiary of Bioline, Sofiproteol, Crédit Agricole, etc.), who is remunerated via a share of the financing and is responsible for labelling. In most cases, they handle the administrative procedures (registration on the platform, filling in forms, submitting the file to the authorities). Other agents, such as Soil Capital, offer their own certification framework.

→ The projects remain technically complex to implement and require time and investment on the part of the project leader (the farmer), supported by the project developer (e.g. the cooperative providing technical support on the various decarbonisation levers).

→ This system can pose a financial risk both for the financier, who takes the risk in the event of anticipated reductions, and for the farmer, who takes the risk in the event of ex post reductions. This is because the farmer receives the funding five years before the final validation of the credits allocated. The funding received in year 0 is estimated on the basis of the theoretical impact of changes in practices. At the end of the five-year project implementation period, an audit determines the actual impact of the practices implemented. However, this risk is generally addressed by making conservative assumptions about the tonnes of CO₂e avoided.

→ While in the vast majority of cases there are significant initial investments, there is a model risk in changes to the practices implemented. Operating costs may vary from forecasts. The agent is responsible for the financial schedule and the farmer is paid as and when the work is carried out and may even be granted advances.

→ Prices traded on the markets (€20.4/teqCO₂ on average in France for agriculture/agroforestry projects, €34.5/teqCO₂ for credits with the low-carbon label⁵¹, and internationally even USD 6.5/teqCO₂ for agricultural projects⁵²) may be low compared to the cost of agricultural transition projects, even though there is considerable variability in abatement costs depending on the decarbonisation levers used. Carbon credits therefore sometimes only represent partial compensation for the efforts made.

51 Carbon Neutrality Contribution Info (2024), [Overview of carbon contribution from France's perspective in 2024](#), Page 5: "The slow growth in the average price per tonne of CO₂ eq continues. The average price of credits sold continues to rise, as was already noted last year. In our sample, credits were sold at an average price of €8.05/t CO₂ eq (compared to €4.6 in 2021 and €6.1 in 2022). As in previous years, this amount masks significant disparities between selling prices, which depend greatly on location, type of certification and the nature of the activities. For example, the average selling price for the Low Carbon Label is €34.5/t CO₂ eq. This level ensures a better financing rate for project developers, even as quality expectations increase, but it can still be a barrier to sales for some companies. Page 9: The average price of credits sold for agriculture/agroforestry projects is €20.4 in 2023 in France, which is well above the average prices for renewable energy (€4.3) or forestry (€13.5) projects.

52 Ecosystem Marketplace (2024), [State of the Voluntary Carbon Market 2024](#) Page 10: Globally, the average price of credits linked to agricultural projects was USD 6.5 in 2023, which is equivalent to the average price for all project categories combined.

Focus - The development of payments for environmental services

The **financing of services provided to ecosystems**, such as payments for environmental services, are interesting but still experimental financing models. Many private and public actors are implementing them. The best-known example is water management agencies, which can use PES to implement a form of "**remuneration for not degrading water quality**".

Several initiatives are underway, such as the Hauts de France Regenerative PES, which brings together Pour une Agriculture du Vivant (which is unique in combining public and private funding) and the Artois-Picardie Water Agency. On the private side, we can cite the example of Vit-tel, which is implementing PES for farmers working upstream of water sources to preserve water quality, but also industrialists such as McCain, Cristal Union, Brioche Pasquier and LUMH, enabling farmers to benefit from a sectoral premium and PES to change their practices.

There are many challenges associated with PES:

- **Methodological**, due to the need to **establish representative** and measurable **indicators** for biodiversity and water quality⁵³;
- **Massification**, given that the impacts are only measurable if a significant number of farmers are involved in a given area
- **Attractiveness in terms of remuneration for farmers, so that these PSE programmes can be implemented over the long term.**

PUBLIC PES FROM THE MINISTRY OF ECOLOGICAL TRANSITION AND WATER AGENCIES.

The **intervention programmes launched for the period 2025-2030** are adopted by each of the water agencies at the level of each basin. Each agency sets development objectives for the PSE. For example, the Loire-Bretagne water agency has set a course for an action plan worth €2.43 billion over the next six years, with quantified objectives for each priority issue, particularly in terms of hectares supported through aid for conversion to organic farming, MAEC or PSE⁵⁴.

The PES proposed by the Ministry of Ecological Transition and the water agencies since 2020 have been based since January 2025 on the achievement of results observed each year on the farm's UAA, or, if justified, on the plots committed to the area at stake, over a period of 5 to 7 years. The scheme focuses on two categories of environmental services provided by farmers:

- **The management of landscape structures** (non-agricultural areas such as hedges, ponds, etc.)
- **Management of agricultural production systems**, in particular the management of plant cover and agroecosystem resources (management of nitrogen, carbon, etc.).

From an environmental perspective, for certain agencies, these services must primarily address the challenges of **restoring water quality, reclaiming biodiversity and adapting to climate change**⁵⁵.

The aim of these tailored PES is to adapt to the needs and challenges of local areas and farmers.

53 There are multiple indicators tailored to the challenges facing the region in the MTE/Water Agency's public PSE programmes.

54 According to the 12th intervention programme 2025-2030 of the Loire-Bretagne water agency: [link](#)

55 See the Ministry of Ecological Transition website dedicated to the PSE: [link](#)

An example of a private PSE

Actions have been implemented to complement public PSE schemes. For example, the **Carabes & Canopée** association, which mobilises local stakeholders (farmers, environmental associations, local authorities), aims to raise private funds **to support and finance farmers** who commit to virtuous practices, but also to **provide training and raise awareness** in order to *"create a culture of hedgerows shared with local users"*⁵⁶. The aim is to sign PSEs with local businesses so that there is a direct link between farmers and the signatory companies. For these PSEs, the association acts as an intermediary with the companies (unlike public PSEs, where the intermediary role is played by the project leaders, i.e. the local authorities).

To encourage good management and densification of hedges, the specifications require, in particular, that the entire usable agricultural area of the farm be committed and that farmers participate in at least one of the training or exchange days organised each year. According to an example shared on the association's website: *"a 60-hectare farm with an initial density of 60 ml/ha will receive €3,280 in year 1 and up to €7,200/year in subsequent years if it reaches 100 ml/ha"*.

Unlike public PES, these private PES have the advantage for beneficiaries of being cumulative with MAECs. Like public PES, they take into account the existing situation prior to the contracts in order to reward upstream efforts. These contracts are more suited to small farms. These PES can be used throughout the country, whereas public PES target specific areas based on collective regional projects.

IS AGRICULTURAL TRANSITION INSURABLE?

There is a single contract to insure crops against climate risks, the MRC (Multirisques Climatiques). Since a reform in 2023 to improve the take-up rate (which was 17% in 2022), the State subsidises 70% of the contract and bears part of the risk in the form of reinsurance for insurers. It remains little used (~23% of usable agricultural land insured in 2024⁵⁷), but its use is growing rapidly. The government's target for 2030 is to achieve a coverage rate of over 60% for arable crops, vegetables and vines, and 30% for arboriculture and grassland.

The **2023 crop insurance** reform is structured in three tiers, corresponding to varying levels of loss. Under this framework, losses below the 20% threshold are the responsibility of the farmer, who is neither insurable nor eligible for compensation. **Above the 20% threshold, they can obtain cover through the MRC.** Finally, exceptional hazards (third stage) trigger state intervention through the Indemnité de Solidarité Nationale (ISN), including for uninsured farmers⁵⁸.

56 According to the dedicated page on the Carabes & Canopée association website, "PSE, training, awareness-raising: our levers for action around hedges": [link](#)

57 According to the 2024 Senate [information report](#)

58 "Crop insurance 2023-2025 (1/2): the reform in 6 graphs and 6 species groups", January 2023, [link](#)

In the context of agricultural transition, the question arises as to whether crop insurance is an accelerator or a brake on changes in farming practices.

Some argue that income stability encourages transition. Others argue that, given that risks are covered, there is no incentive to reinvent one's model or adapt it to climate change.

How can crop insurance be adapted to help farmers transition?

Some insurers now claim to adjust crop insurance rates, particularly downwards, if they can demonstrate that changes in practices implemented reduce risk – s (resilience to drought, etc.). On the other hand, some insurers believe that, on the contrary, converting to organic farming, for example, increases the volatility of harvests by 30 to 50% in the face of climate risks, which increases the premium by around 3%. The main challenge is access to data in order to assess these risks and adjust contract premiums.

What about insurance against transition risk? **Currently, there are no "transition insurance" contracts available**⁵⁹. Implementing such a system seems difficult given the current situation of the MRC, compounded by **the uncertainty** associated with:

- Costs due to **loss of yield** (lower yields, at least in the short term)
- **Greater vulnerability to health hazards** that could impact harvests (increased risk)
- The addition **of moral hazard**: how can we ensure that farmers have done everything possible?

It remains difficult to quantify the risk associated with changing agricultural practices, making it very difficult to insure⁶⁰. With regard to the associated increase in risk, the only way to make this insurance profitable is through public subsidies. Finally, with regard to moral hazard, one way of limiting it is to draw up a set of specifications for practices to be implemented, based on the model of foreign prospecting insurance, which enables certain SMEs to insure the risk of seeking international markets.

Few insurers are therefore positioning themselves in this area in response to farmers' demand for full coverage of yield losses, which is impossible without state contribution due to **the cost** involved. However, some insurers are experimenting with schemes, such as Groupama and Axa, which are developing an insurance product for reducing pesticide use in viticulture.

Furthermore, **current regulations** on insurance products **do not allow for the design of products** that incorporate health risks and sustainable agricultural practices; only climate risks are covered, with the same levels of cover for all farms.

⁵⁹ This concept deserves to be better defined through discussions to determine the characteristics of such an insurance contract (risks covered, type of crops, risk distribution between farmers/insurers/the State).

⁶⁰ "Study on insurance mechanisms for reducing pesticides in agriculture in France", Banque des Territoires, 2023/24

The limitations of MRC insurance

The uptake of MRC insurance is hampered by several factors, with farmers preferring to rely on government intervention in the event of a disaster.

On the one hand, the **terms and conditions of the contracts** can prevent policyholders from receiving full compensation in the event of a disaster. For example, following a harvest deemed particularly catastrophic in 2024 – cereal farmers experienced one of the worst yields in 40 years – farmers and unions denounced ambiguities in **the application of crop insurance**, which does not come into play when losses are attributed to a hazard considered non-climatic. This is the case, for example, when losses are linked to the development of fungal diseases, even though their appearance is clearly due to excessively rainy weather⁶¹.

Furthermore, another consequence of this type of extreme weather event is the **deterioration of historical yield references** for farms, which are used to calculate loss rates for compensation purposes⁶².

61 "A catastrophic harvest", September 2024, [link](#)

62 "Crop insurance, collateral victim of the poor harvest of 2024?", August 2024, [link](#)

IS THE POOLING OF AGRICULTURAL EQUIPMENT A WAY OF BETTER DISTRIBUTING THE COST OF THE TRANSITION HORIZONTALLY?

CUMA: a major vehicle for disseminating equipment, sustainable practices and reducing investment costs for farmers

Agricultural equipment cooperatives (CUMA) enable farmers (at least four) to pool various resources (machinery, labour, sheds, etc.). With nearly half of all farmers in France belonging to one, these cooperatives are a real lever for change in favour of the transition at the regional level⁶³.

Since 2019, the National Federation of CUMA and its partners have been committed to promoting and experimenting with regional agroecology, with the aim of *"testing and deploying viable solutions within farmer groups in order to spread them throughout its network"*.

The impact of the CUMA and its "action research" approach is beneficial on several levels:

- **Stimulation of innovation**, thanks to a secure framework that allows members to "de-risk" their approach
- **Transfer of new technologies**, particularly promoting the dissemination of precision farming practices and equipment

→ **Development and dissemination of agroecological practices** (soil conservation, controlled irrigation, reforestation, etc.)

→ **Moderation of investments and projects**, thus avoiding over-equipment and over-indebtedness of individual farmers

The 2IDCUMA project, led by AgroCampusOuest in partnership with the University of Rennes and the FNCUMA, has established a link between the density of CUMA (cooperative for the use of agricultural equipment) in a given area and the reduction in pesticide use, *"probably linked to a change in the means of production (i.e. shared machinery) but also – and perhaps more certainly – to the way in which members change their use of these means of production (through socio-technical exchanges between peers)"*⁶⁴.

These environmental benefits are in addition to the direct advantages for members (control of production costs, improved working conditions, etc.) and regions (creation of stable jobs, easier settlement of young people, etc.).

⁶³ According to the FNCUMA website page "Being a network committed to agroecological transitions", [link](#)

⁶⁴ According to the FNCUMA website page "The impact of Cuma on the environment", [link](#)

THE VALUE CHAIN: STILL INSUFFICIENT DISTRIBUTION OF THE COST OF TRANSITION

The feasibility of the agricultural transition depends on the equitable distribution of costs throughout the value chain, from agricultural production to the end consumer. Given the investments needed to decarbonise agricultural practices, every link in the chain – producers, manufacturers, distributors and consumers – must play a role. Today, this distribution of roles needs to be better defined.

6,4€ For every €100 spent by consumers in France on food, €6.4 goes to French farmers, €25.6 represents imported products, €10.5 goes to the agri-food industry, €3.1 to other industries, €14.3 to catering, €13.9 goes to services, €15.5 to retailers, and €10.5 goes to taxes⁶⁵. For example, for a litre of semi-skimmed milk sold for €0.89 in a supermarket in 2022, €0.25 went to the farmer (28%), €0.35 went to the industry (39.5%), €0.24 (27%) to the distributor and €0.05 (5.5%) to VAT⁶⁶.

THE AGRICULTURAL TRANSITION RAISES THE QUESTION OF HOW COSTS ARE DISTRIBUTED THROUGHOUT THE VALUE CHAIN

Agricultural production is the first link in the **agri-food value chain**, followed by the processing industry, the distributor and finally the end consumer. In particular, the **decarbonisation of agricultural practices** can be associated with an **increase in production costs and therefore in the price of agricultural materials, which is passed on at each link** in the value chain to **the end consumer**.

The **cost of decarbonisation and its acceptability** vary **depending on the sector** and its exposure to the international market. For example, it is estimated **at €0.05-0.10/litre in the case of milk**, which is mainly sold on the domestic market⁶⁷. If this cost were passed on in full to the consumer in the price of a carton of milk, it would represent an inflation rate of 4 to 9%. These estimates should be viewed in the context of inflation, particularly for a litre of semi-skimmed milk in supermarkets, which is expected to rise by around 29% between 2021 and 2023 (+7% in 2022 and +20% in 2023)⁶⁸.

However, there is **currently only marginal recognition of these practices**, beyond the organic label or certain designations such as "living agriculture", to guide consumers in their choices. Similarly, in the case of collective catering tenders, reducing the carbon impact by changing supplier practices is rarely valued today.

65 Observatory on food prices and margins, Report to Parliament, 2024

66 Ibid.

67 Hearing with Carbone 4

68 Observatory on food prices and margins, Report to Parliament, 2024

Yet the **decarbonisation of agricultural production is a key issue for the decarbonisation of manufacturers and distributors**, as it accounts for up to **~80% of their Scope 3 CO₂ emissions**⁶⁹.

FOCUS – Sodiaal Transitions: financing platform for the transition of the dairy industry

Sodiaal, a dairy cooperative, offers volunteer farmers funding to implement more sustainable practices. Faced with an estimated €3 billion in financing needs⁷⁰ to achieve the transition of the entire French dairy industry, **the Sodiaal cooperative is innovating with the launch of a financing platform: Sodiaal Transitions**. In particular, Sodiaal is offering to **cover the cost of changing practices by increasing the purchase price of milk without increasing the selling price**.

With this scheme designed to finance transition projects, **the dairy cooperative offers all direct and indirect players in the dairy industry** the opportunity to finance **structural sustainability projects** through a range of services, such as:

- **Reducing CO₂ emissions:** The platform enables the financing of equipment and services aimed at reducing CO₂ emissions, such as micro-methanisers for dairy farms.
- **Protection of biodiversity:** Sodiaal Transitions contributes to nature regeneration projects, such as planting hedges on farms, thereby supporting biodiversity.
- **Low-carbon milk volumes:** Customers can allocate milk volumes based on their carbon footprint, promoting the integration of sustainable, French milk into their production chain.
- **Improving farmers' living conditions:** The platform finances days off or training courses to support the cooperative's farmers in their daily lives.

This effort on the part of the cooperative is necessary but, at this stage, does not allow for the financing of a comprehensive transformation: the increase in the purchase price offered by Sodiaal is around 0.5 pence per litre, compared to an estimated 5-10 pence per litre for a comprehensive and transformative transition in the sector. The aim is therefore to accelerate the ecological transition by engaging the entire milk value chain and passing on part of the cost to the consumer to ensure fair remuneration for farmers.

FOR AGRI-FOOD MANUFACTURERS, FINANCING AND SUPPORTING THE AGRICULTURAL TRANSITION CAN HELP TO ENSURE THE RESILIENCE OF THEIR BUSINESS.

Fair remuneration for farmers is a key issue for the sustainability of the agri-food sector and its stakeholders. Beyond remuneration, the role of manufacturers in the agricultural transition revolves around three levers: unlocking farmers' investment capacity, providing industrial know-how and ensuring alignment of the value chain in negotiations⁷¹.

Agri-food manufacturers are a major purchasing force for agricultural materials, seeking to **contribute to the financing of the agricultural transition** in order to guarantee their **future capacity to produce** and be resilient.

69 Carbone 4 hearing and figures shared by several agri-food manufacturers interviewed.

70 Sodiaal figure

71 Vision defended by players such as Andros

The agri-food industry committed to encouraging regenerative farming practices – the example of McCain in France⁷²

Present in France since 1981 through its three production sites in Harnes, Béthune and Matougues in the Marne region, McCain produces nearly 600,000 tonnes of finished products each year from the million tonnes of potatoes sourced directly from its partner farmers.

McCain sources its supplies locally. More than 800 partner farmers, mainly located in the Hauts-de-France and Grand Est regions, are members of GAPPI, France's leading organisation of potato producers for industry. This direct relationship with farmers enables the company to support them in the agroecological transition, as it is committed to encouraging regenerative farming practices⁷³ across all potato production areas for the group by 2030. More than 50% of McCain's partner farmers in France are involved in this ecological transition.

This initiative is part of a broader strategy by McCain, which plans to invest €355 million in France, including €300 million dedicated to modernising its Harnes factory by 2027. This investment aims to increase production capacity, reduce the company's carbon footprint and strengthen its integrated supply chain, from farm to factory, with its partner farmers.

In particular, **the manufacturer** can **provide financing** and **expertise** in terms of **agricultural mechanisation**, the^{second} largest **investment item** for a farmer⁷⁴. Mechanisation can account for up to 30% of operating costs⁷⁵.

It is in everyone's interest **to align the objectives of the value chain** to enable a long-term transition. In this way, the **establishment of long-term contracts** provides producers, industry and even distributors with visibility on their revenues, costs and investment capacity. For the dairy industry, **tripartite negotiations with distributors** have been set up to take into account **changes in the cost price** for producers and the purchase price for manufacturers.

⁷² <https://www.mccain.fr/nos-engagements/agriculture-raisonnee-et-durable#:~:text=Committing%20to%20agriculture,000%20hectares%20worldwide>.

⁷³ See glossary at the end of the report

⁷⁴ For example, Andros has developed more than 30 harvesting machines, in collaboration with equipment manufacturers, which are made available to its upstream fruit growers in exchange for a reduction in the purchase price of the raw material.

⁷⁵ "Raisonnement la mécanisation agricole pour faire baisser ses charges" (Using agricultural mechanisation to reduce costs), November 2024, [link](#)

WHAT ROLE DOES DISTRIBUTION PLAY IN THE AGRICULTURAL TRANSITION?

Distribution plays a crucial role in the agricultural transition by influencing production practices and guiding consumer choices. However, the distributors surveyed highlight the difficulty of going beyond consumer demand: **large retailers are primarily in a position to serve demand and are constrained by consumer demand in terms of price, particularly in this period of inflation.**

Initiatives such as "C'est qui le Patron ?!" (Who's the Boss?)⁷⁶ illustrate this dynamic by allowing consumers to co-create products that meet ethical and environmental criteria, while ensuring fair remuneration for producers. This collaborative approach strengthens the link between producers and consumers, promoting sustainable agricultural practices.

In addition, tripartite contracts involving cooperatives or producer groups, manufacturers and distributors are becoming increasingly common. These agreements, often established for periods of five years, guarantee stable prices and volumes, offering farmers greater financial visibility. For example, retailers such as Carrefour collaborate with around 20,000 producers in France, particularly in the meat and potato sectors, in return for commitments to corporate social responsibility (CSR). The giant E. Leclerc also promotes these practices, as in the case of the contract for 60 million litres of milk with 700 producers from APLBC, LSDH and Andros for its Repère and Eco + brands in November 2024, thereby increasing its contracted milk volumes to 290 million litres⁷⁷. However, the implementation of these contracts requires time and close coordination between stakeholders to ensure their effectiveness.

CAN CONSUMERS PAY FOR THE COST OF AGRICULTURAL TRANSITION?

The cost of the agricultural transition will inevitably have an impact on consumers. But consumers are not necessarily prepared to bear the entire cost. On the other hand, a study by I4CE shows that reducing meat consumption would limit the impact on purchasing power⁷⁸.

Given the **investments required** and **the impact on yields** of the changes in practices associated with the agricultural transition, a **major challenge** is how **to pass on the cost** to the various players in the **value chain**. While **agri-food manufacturers and distributors** could absorb part of this cost, it seems inevitable **that part of it will be passed** on to the end consumer, given that food expenditure already accounts for nearly **30% of the disposable income of the most modest households**⁷⁹.

⁷⁶ <https://cestquilepatron.com/>

⁷⁷ See article in La France Agricole, [link](#)

⁷⁸ I4CE, "Does more sustainable food increase consumers' budgets?", 2021

⁷⁹ Ibid.

At **equal consumption and equal budget**, at 2017 prices, the average household shopping basket can contain **3% organic products**. On the other hand, a **change in consumption** based on a **reduction in meat consumption** and **food waste** would **limit the impact on purchasing power** of an increase in the consumption of organic products, for example (the additional cost of which is estimated here at +65%).

On average across all households, a **less meat-based shopping basket (-20% meat products)** could enable **25% of products** to be **organic on the same budget**. By adding a **50% reduction in food waste**, the **share of organic products** in the shopping basket of the most modest households could reach **30%**⁸⁰. **Thus, a diet with less meat (including fish) is an important way to reconcile ecological challenges, household budgets and food sovereignty.**

THE DEVELOPMENT OF NEW NON-FOOD SECTORS AS OPPORTUNITIES FOR THE FUTURE?

Beyond food production, the development of non-food sectors represents a strategic lever for diversifying agricultural outlets while financing the ecological transition. These sectors, covering areas such as textiles, bio-based materials and biomass, offer increased capacity to pass on the costs of the transition to the final product, while responding to the decarbonisation challenges of other sectors such as construction (through the production of decarbonised building materials or the energy consumption of biogas) or transport (particularly with biofuels or *Sustainable Aviation Fuels*). For example, the introduction of dedicated crops into agricultural rotations contributes to soil fertility, particularly through the addition of nitrogen, while generating economically valuable products. Flax, for example, when introduced into crop rotation, allows the seeds to be used for animal feed and the straw to be used in brick manufacturing⁸¹.

Agricultural co-products, which are often under-exploited, represent a significant opportunity. For example, the tomato industry can extract molecules for pharmaceutical uses. The pig industry is a prime example⁸²: in addition to meat, it is possible to recover co-products ("the 5quarter") such as biomethane, biodiesel, biostimulants, fertilisers, processed animal proteins, and even heparin for the pharmaceutical industry. These positive externalities show that agriculture, far beyond food, can become a key player in the circular economy.

80 Ibid.

81 Coopération Agricole hearing

82 Cooperl hearing

Like the study on decarbonisation in the building sector, **this work aims to examine concrete cases, business cases and financing applicable to a farmer in his ecological transition process. Several cases will be studied, starting with the main levers of agricultural transition to integrate the challenges of reducing GHG emissions (and developing carbon sinks), protecting biodiversity, adaptation and the type of agricultural model (intensive or extensive agriculture).**

Focus on the choice of cases

The choice of use cases should in no way be perceived as exhaustive or prescriptive. They are primarily the cases most frequently cited during the hearings conducted. It should also be noted that **an analytical approach** has been adopted here: depending on its situation and specific characteristics, a single farm may activate several of these levers to achieve a more comprehensive transition. Furthermore, **modelling requires a simplified approach to the different cases:** in reality, the transition is much more complex and subject to the specific characteristics of each farm. In agriculture, there are as many transition models as there are farms. Finally, **this work is not intended to provide financial, legal or other professional advice and should not be considered as such:** it is research aimed at promoting best practices for financing the agricultural transition.

The study therefore focuses on examining three types of use cases for farmers in their transition:

- **decarbonisation of energy consumption**, which includes the implementation of energy efficiency measures, the use of alternative fuels and the production of renewable energy on the farm;
- **The transition in livestock farming**, which includes reducing methane emissions from animals and nitrous oxide emissions from manure, developing carbon sinks and protecting biodiversity (through the development and management of permanent grasslands and agroforestry⁸³);
- **the transition of crops**, which includes the challenges of reducing the use of herbicides and pesticides to protect biodiversity, and reducing the use of mineral fertilisers, which are sources of nitrous oxide emissions.

They have been developed and broken down into eight sub-cases to reflect as closely as possible the diversity of agricultural transition practices. These cases represent the current "economic equation" of projects under existing regulations and mechanisms. This selection of cases is not intended to be exhaustive, but rather as representative as possible of the diversity of transition levers, as there are as many transitions as there are farms. **The starting point for this work is to identify financing solutions for all farms, regardless of their starting point and operating model, the key being to enable environmental progress for all farms.**

⁸³ Whether it be the development of hedgerows or inter-plot agroforestry in grasslands

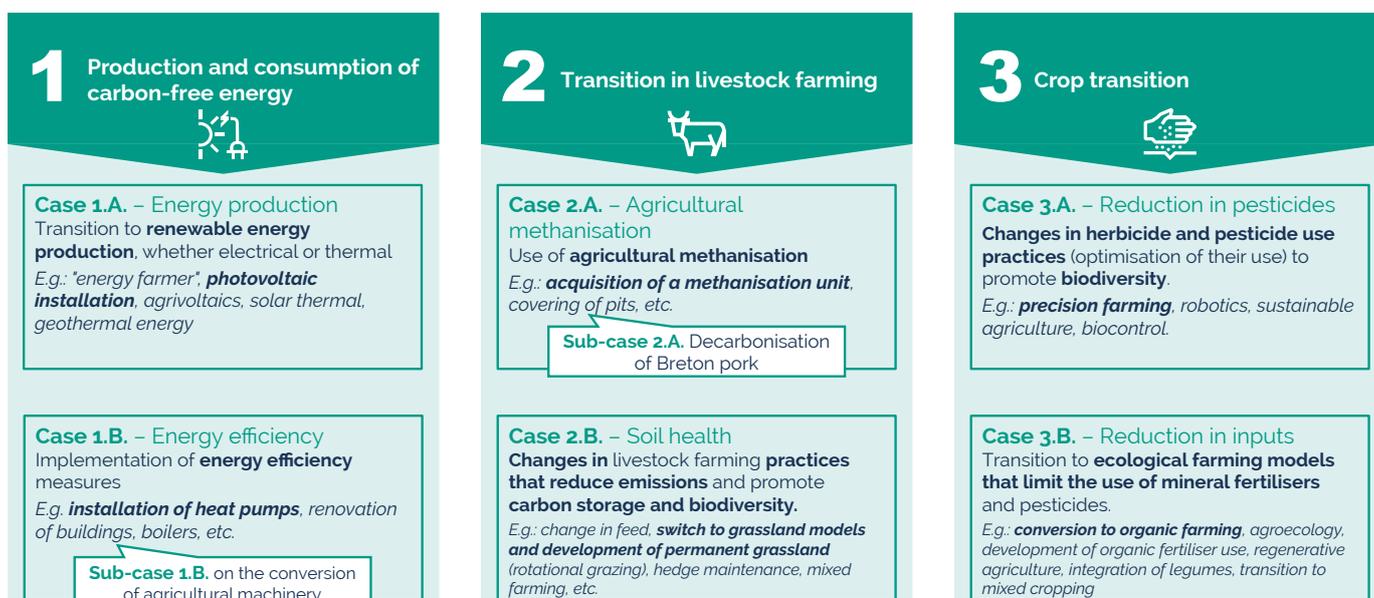


Figure – Case studies

source: Institut de la finance durable

The cases were chosen based on a search for balance between numerous parameters: the main emission factors (carbon dioxide, methane and nitrous oxide), consideration of biodiversity issues (grassland management, precision farming with regard to pesticides and herbicides), carbon sink development issues, climate change adaptation issues, the various transition levers already in place, sectors (in particular cattle and arable farming) and regional and territorial specificities (represented here by the case of Breton pork).

Cross-cutting issue of carbon sink development

The issue of increasing carbon sinks is central to cases 2 and 3. Of the 55 million hectares that make up mainland France, just over 28 million hectares are currently used for agricultural activities. This means that the majority (51%) of land in France is agricultural. However, land use is central to the development of carbon sinks (agroforestry, grassland management, introduction of cover crops), and two-thirds of the land in the European Union is now degraded⁸⁴.

It is therefore necessary to explore cross-cutting *business cases* in agriculture that enable the development of carbon sinks. Agroforestry can be developed by planting trees within cultivated plots and by planting hedges around the edges of cultivated plots. It is also possible to optimise grassland management to promote carbon storage (extending grazing periods, late mowing, etc.). The development of carbon sinks often goes hand in hand with changes in agricultural practices to reduce methane and nitrogen emissions: the cases selected reflect these interactions.

84 INRAE, Review file "Threatened soils", 27 June 2023, [link](#)

KEY LESSONS FROM THE CASE STUDIES FOR AGRICULTURAL TRANSITION

Figure – Variable profitability levels depending on the agricultural transition model

source: Institute for Sustainable Finance

Case study	Case parameters	Amount invested (before subsidy)	Subsidy	Amortisation period	Profitability
1.A. Photovoltaic installation	– 500m ² hangar ²	€110,000	€27,000	~12 years	ROI at 15 years of ~20%
1.B.a Installation of 5 heat pumps	– 2,000 m ² vegetable greenhouse ² – 5 heat pumps	€65,000	~€9,000	~6 years	10-year ROI of ~60%
1.B.b Acquisition of a BioNGV tractor	– 70 ha farm	€150,000	€30,000	NA	Initial investment equivalent to a conventional tractor with subsidy (~€120k); savings over 15 years of €25k for a 70 ha farm (fuel savings increase with surface area); the benefit is mitigated by the TICPE deduction (30% to 20% annual fuel savings)
2.A.a Use of agricultural methanisation	– Mixed farming with 120 head of cattle	€3,000,000	€230,000	~7 years	ROI at 10 years of ~40%
2.A.b. Decarbonisation of Breton pork	– Rearing of ~3,000 pigs	€560,000	€40,000	20	ROI breaks even after 20 years. Energy revenues finance the overall transition.
2.B. Improvement of grassland farming practices	– Grassland cattle farming with 260 head (85 cows), 100 ha (including ~75 ha of permanent grassland)	NA	€15,000/year €75,000 over 5 years	Cost compensation logic	MAEC system based on a cost compensation approach for sustainable practices . By comparison, carbon credits do not cover the expenses incurred. However, MAECs have a limited impact on changing practices.
3.A. Acquisition of a targeted spraying system	– 150 ha cereal farm	€90,000	€36,000	~9 years	10-year ROI of ~17% for an area of 150 ha; the larger the farm area, the greater the gains (due to reduced use of plant protection products)
3.B. Conversion to organic farming	– 47 ha cereal farm	NA	€17,000/year (for 5 years)	Cost compensation logic	Economic vulnerability during the transition period (lower yields, higher costs) offset by subsidies. Potential productivity gains in the long term, but uncertainty about the long-term price premium.

LESSON 1: Overall, agricultural transition projects have low economic profitability, even though agriculture is already one of the sectors with the lowest returns on investment. However, there is a major difference between energy projects, which are already profitable (energy efficiency, energy self-consumption, methanisation, etc.), and non-energy transition projects, which are not. The decarbonisation of energy consumption is made economically possible in part by on-farm energy production (as in the case of the pig industry).

LESSON 2: The transition appears to be an obstacle to competitiveness, but it can be turned into an opportunity if it is properly supported. In some cases, the subsidies allocated can sometimes be significant and represent an opportunity for farmers to change their model (conversion of agricultural machinery, the MAEC system).

LESSON 3: A key challenge is to build collective skills within the sectors in order to develop practices adapted to an increasingly changing climate. If the transition is well supported from a technical point of view, it represents an opportunity for farmers to develop expertise that enables them to build resilience to climate hazards, autonomy from international market costs (particularly fertilisers) and new productivity through agronomic innovation.

LESSON 4: To encourage transition, farmers need to be supported in taking risks and given long-term visibility. The success of energy transition projects, for example, can be explained by the stability of purchase (or compensation) prices for electricity and biogas. The same visibility must be provided for non-energy projects, particularly in conversion, for example, not only in terms of financial support mechanisms but also in terms of production outlets.

LESSON 5: The price of carbon traded on the markets (€20.4/teqCO₂ on average in France for agriculture/agroforestry projects, €34.5/teqCO₂ for credits with the low-carbon label⁸⁵, and internationally even USD 6.5/teqCO₂ for agricultural projects⁸⁶) is sometimes below the actual abatement costs⁸⁷. While this may provide additional income, paying the fair price for carbon and ecosystem services is a prerequisite, the "operating" price that triggers trade-offs favourable to decarbonisation.

LESSON 6: Farmers cannot act alone. The transition effort must necessarily involve the downstream chain. The cost of the transition must be spread across the entire value chain to ensure fair remuneration for farmers. Beyond the cost, solutions can come from all stakeholders. Chambers of agriculture, professional federations and agricultural cooperatives can all provide solutions for the sectors.

LESSON 7: Although necessary to regulate the use of products and the most harmful practices, regulatory constraints are only part of the solution. The key is to strike a balance between regulation and incentives: numerous examples of best practices and financial incentive schemes have proven their worth. For example, MAECs have been relatively successful with farmers in certain regions of France because they support the implementation or maintenance of certain good practices. Developing targeted aid solutions focused on major changes in models could help bring new farms on board.

LESSON 8: Strong agriculture for France that enables food sovereignty. Case studies show that all farms have the levers at their disposal to move towards a more sustainable model. The aim is to provide each farm, regardless of its starting point, with the appropriate financial tools to address its specific issues.

⁸⁵ Carbon Neutrality Contribution Info (2024), [Overview of carbon contributions from France's perspective in 2024](#). Page 5: "The slow increase in the average price per tonne of CO₂ equivalent continues. The average price of credits sold continues to rise, as was already observed last year. In our sample, **credits were sold at an average price of €8.05/t CO₂ eq** (compared to €4.6 in 2021 and €6.1 in 2022). As in previous years, this amount masks significant disparities between sale prices, which depend greatly on location, type of certification and nature of activities. For example, the **average selling price for the Low Carbon Label is €34.5/t CO₂ eq**. This level ensures a better financing rate for project developers, even as quality expectations increase, but it can still be a barrier to sales for some companies. Page 9: **The average price of credits sold for agriculture/agroforestry projects is €20.4 in 2023 in France**, which is well above the average prices for renewable energy (€4.3) or forestry (€13.5) projects.

⁸⁶ Ecosystem Marketplace (2024), [State of the Voluntary Carbon Market 2024](#) Page 10: Globally, the average price of credits linked to agricultural projects was USD 6.5 in 2023, which is equivalent to the average price for all project categories combined.

⁸⁷ See the abatement costs listed in the articles: "[How much does French agriculture contribute to reducing greenhouse gas emissions? Mitigation potential and cost of ten technical actions](#)" (Pellerin, Bamière et al., 2013) and [Nosra Ben Fradj, Laure Bamière. Mitigating greenhouse gas emissions in the agricultural sector: What levers, technical potential, costs and support mechanisms are available in the regions?](#)

LESSON 9: Many public actors are involved in supporting the agricultural transition. Simplifying the framework as much as possible and strengthening cooperation between actors would make it easier to steer the transition effectively.

LESSON 10: Agriculture remains a sector with a promising future, in which the financial sector can provide solutions to accelerate the movement by offering financial support tailored to all transitions.

METHODOLOGICAL REMARKS: FRAMING THE WORK THROUGH CASE STUDIES

General remarks concerning these three cases:

- For each of the sub-cases, it was interesting to have a quantification in terms of expected carbon gains to be compared with the cost of the transition⁸⁸.
- Each case may involve numerous sub-cases depending on the type of agricultural production, its size, geographical location, available aid and the transition levers chosen. For the sake of clarity, the study will be limited to the most typical cases, without ignoring the complexity and specificity of each particular situation.
- As far as possible, these transformations are compared with the *business-as-usual* scenario, whether in the context of the transformation of an existing farm or the establishment of a young farmer, particularly in relation to a "traditional" investment (purchase of a combustion engine vehicle, establishment of a young farmer in conventional agriculture, etc.).
- In the various cases discussed, investments in ecological transition are not necessarily CAPEX but rather OPEX. In agricultural transition, the main costs are the additional costs associated with the loss of income during the transition from one model to another. The question of financing the transition is therefore more a question of providing support during this period of volatility before a potential recovery in income: this is the U-shaped income curve (see the case of conversion to organic farming).

⁸⁸ See "[How much can French agriculture contribute to reducing greenhouse gas emissions? Mitigation potential and cost of ten technical actions](#)" (Pellerin, Bamière et al., 2013) and Nosra Ben Fradj, Laure Bamière. [Mitigating greenhouse gas emissions in the agricultural sector: What levers, technical potential, costs and support mechanisms are available in the regions?](#)

For each case, the study answers the following questions:

- **Project path:** What are the main stages in each case? How complex is the path and how long does it take?
- **Project support elements:** What financial assistance and tools are available to help the project succeed (e.g. financial assistance, etc.)? Who are the actors involved in providing this assistance (e.g. government, banks, etc.)?
- **Project obstacles:** What are the obstacles to the project?
- **Project stakeholders:** Who are the stakeholders involved in the project, particularly in terms of financing? How are they distributed? Under what conditions?
- **Project benefits and disadvantages:** What are the benefits of the project, particularly for farmers, and over what time frame? Who are the winners and losers? What are the savings (costs, psychological, etc.)? What are the environmental gains?

In these case studies, the *ultimate* goal is to understand the financing process for project leaders in these different cases and to understand what the sources of financing are today (self-financing, loans, subsidies, public guarantees, etc.). The aim is to understand where the participation of the State and financial actors is necessary and must be strengthened in order to promote the economic profitability of these projects.

In this context, it was essential to gather feedback from all stakeholders (project leaders, cooperatives, agri-food manufacturers, financiers, service providers, the State, etc.) for each case in order to clarify assumptions, identify bottlenecks and better understand their needs and expectations.

CASE 1: DECARBONISATION OF ENERGY CONSUMPTION ON FARMS⁸⁹

This first group of cases concerning the decarbonisation of energy consumption includes the implementation of renewable energy production measures on farms, energy efficiency measures (whether for farm buildings or associated greenhouses) and the purchase of more efficient or alternative fuel machinery.

"Energy farmers": the future of decarbonised agriculture?

In 2022, the CGAAER⁹⁰ published a report entitled "Decarbonising 100% of the energy used in agriculture by 2050: it's possible!". This forward-looking report explores the possibility of completely decarbonising energy consumption in agriculture by 2050. It proposes three scenarios, including the "Energy farmers" scenario, which is based on significant renewable energy production on farms, with maximum self-consumption to power agricultural machinery, livestock buildings and greenhouses, but also the resale of surplus energy to contribute to the overall decarbonisation of the energy mix and improve farmers' incomes.

The complete decarbonisation of direct energy consumption in the agricultural sector over 30 years corresponds to the elimination of the 11 MtCO₂eq of CO₂ emitted by the sector in 2017, i.e. more than 25% of the effort required of the sector in terms of reducing its GHG emissions by 2050. It is therefore essential to take action, on the one hand, to improve the energy efficiency of energy use and, on the other hand, to replace fossil fuels with decarbonised energies.

In an energy and agricultural context marked by considerable uncertainty, the CGAAER considers it feasible to achieve energy savings of around 15% compared to current consumption by 2050 and to replace 100% of current fossil fuel use with renewable energies.

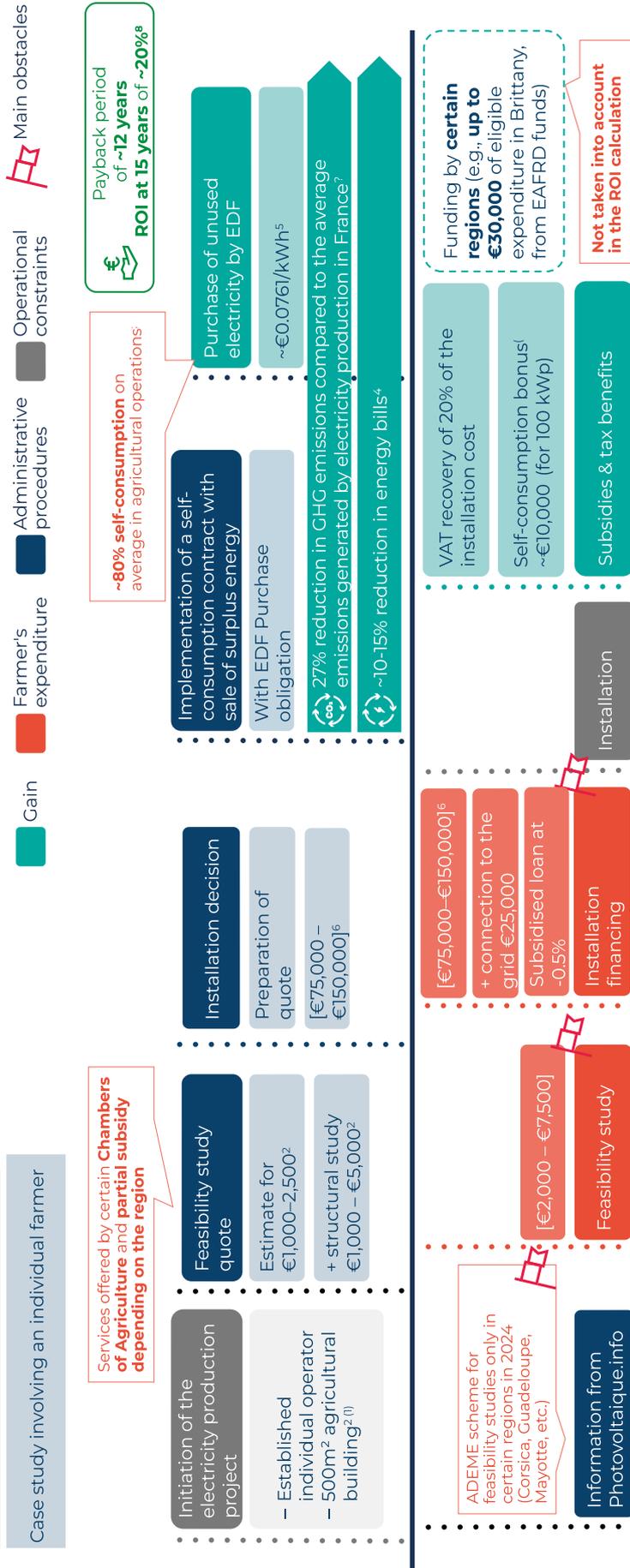
To envisage the success of such a transition within an increasingly limited timeframe, three prospective scenarios are presented. Only the first, "Energy farmers", meets this objective. It is based on a significant increase in the availability of renewable energy on farms and the widest possible self-consumption of this energy produced by farmers for agricultural machinery, livestock buildings and greenhouses.

The "Energy farmers" scenario, which corresponds to very high energy production by farmers across 80% of farms (solar panels, biomass or biofuel crops, methane generators, wind turbines, etc.), also allows for a significant improvement in farmers' incomes. This additional income, combined with savings on energy costs, could represent at least €5,000/year to more than €20,000/year per farm in 2050; in return for a small increase in work, this represents an average net income increase of 30% compared to 2021 (in constant euros).

⁸⁹ See in particular on this subject: <https://agriculture.gouv.fr/dispositifs-de-decarbonation-de-lagriculture-leviers-et-perspectives-analyse-ndeg196>

⁹⁰ The General Council for Food, Agriculture and Rural Areas (CGAAER) is a French advisory body under the direct authority of the Minister of Agriculture. It provides advice, expertise, assessment, auditing and inspection services on strategic issues such as agroecology, adaptation to climate change, health and market crisis management, and international support. The CGAAER also participates in the drafting of legislation and the modernisation of public policy.

Transition to renewable energy production model – Case study of a photovoltaic installation



1. Average size of agricultural buildings in France, farms in mainland France in 2020 (Agreste) | 2. Range for a study carried out by a design office (Source: Photovoltaïque.info), structural study potentially requested by the insurer or technical controller of the project. | 3. Order of magnitude of installation cost for a 100kWp installation (Monkitsolaire.fr) | 4. Aid paid by the State through EDF OA, the payment of the premium is added to the profits linked to the sale of surplus energy, amounts reviewed each quarter by the CRE. | 5. Rates in force in Q4 2024, subsidised and fixed feed-in tariff over 20 years | 6. Data from Monkitsolaire.fr | 7. Data from INSEE (2021) "Energy consumption and production in the agricultural sector". | 8. 16% of agricultural energy consumption related to electricity, with an assumption of 80% self-consumption | 8. Considering an initial net investment of ~€100k and an annual net profit of ~€8k over 15 years, with a discount rate of 2.5% | 9. According to data from RTE, which manages the French electricity grid, French electricity production emitted approximately 60 g of CO2 per kWh in 2022, whereas the carbon footprint of French solar panels is estimated at 43.9 gCO2eq/kWh in 2022 by ADEME (carbon footprint of Chinese panels, which make up the majority of panels).

CASE N° 1.A. ENERGY PRODUCTION: TRANSITION TO A PHOTOVOLTAIC ELECTRICITY PRODUCTION MODEL

This case covers electricity production models for resale or self-consumption, including photovoltaics, agrivoltaics, solar thermal and geothermal energy. According to the stakeholders interviewed, the agricultural sector is undergoing a genuine process of "solarisation". These levers are also intertwined with the challenges of diversifying the economic models of agricultural holdings, but also adaptation (as in the case of agrivoltaics). The case study below focuses on the installation of a photovoltaic production system for both self-consumption and resale to the grid.

In 2023, the Renewable Energy Acceleration Act was introduced to enable the country to catch up in this area. In 2020, France was the only country not to have achieved the European Union's target of 23% renewable energy share⁹¹. This law introduced solarisation requirements for buildings larger than 500 m², as well as a legal definition of agrivoltaics.

The installation of photovoltaic panels is one of the solutions that enable electricity to be produced, either for partial or total self-consumption, or for total resale.

Self-consumption is becoming more widespread as the production costs of renewable electricity installations fall and electricity prices rise. According to Ademe, energy accounts for between 12% and 20% of a farm's operating costs. Reducing energy bills is therefore a competitive advantage for farmers. Assuming a self-consumption rate of 95%, the savings generated average around €6,500 per year excluding VAT⁹².

Furthermore, if the photovoltaic installation is less than or equal to 500 kWp, farmers are eligible for government assistance through EDF Obligation d'Achat (EDF OA), which guarantees the purchase of surplus electricity for 20 years⁹³.

91 See the agriculture.gouv website page dedicated to Law No. 2023-175 of 10 March 2023 on accelerating renewable energy production: [link](#)

92 "Agricultural photovoltaic hangars: the complete guide 2025", November 2024, [link](#)

93 "Agricultural photovoltaic aid: official grants and subsidies", October 2024, [link](#)

Aid is available to help operators finance the installation. The photovoltaic self-consumption subsidy was created by the government in 2017 to reduce the cost of this initial investment. The more powerful the installation, the lower the premium. According to the scale valid until 31/01/2025, a 100 kWp installation is eligible for a premium of €100/kWp⁹⁴, i.e. €10,000. In addition, ADEME can contribute up to 60% of the cost of external feasibility studies, up to a maximum of €100,000. The recovery of VAT at a rate of 20% of the cost of the installation (equipment and labour)⁹⁵ also makes the operation more attractive.

Some regions, such as Brittany, finance photovoltaic installations for total self-consumption, exclusively intended to cover the energy needs of agricultural activity. Under the AGRI Invest scheme of the 2023-2027 Programme, this type of investment in the "Climate and Carbon Resilience" category receives the most support, with a single aid rate of 40%. Taking these parameters into account, the operation is economically beneficial to farmers, who see a return on their investment within 8 to 12 years⁹⁶. Beyond the amortisation period, they receive an annual income from the sale of electricity until the end of the installation's life, without the farm incurring any labour or maintenance costs. Manufacturers guarantee performance for 25 years, even though the panels can continue to produce beyond this period⁹⁷.

Even if a photovoltaic self-consumption project is theoretically financially attractive to farmers today, the initial investment can be substantial (€75,000 to €150,000 in the case study) and therefore limiting. Some third-party financing solutions exist: the installer-financier owns the solar panels and is remunerated from the sale of electricity. The farmer does not pay any money but makes the land available under a contract with the third-party financier. This allows the farmer to either finance the construction of a farm building (which the third-party financier takes care of), or to receive regular remuneration in the form of rent on a long-term lease.

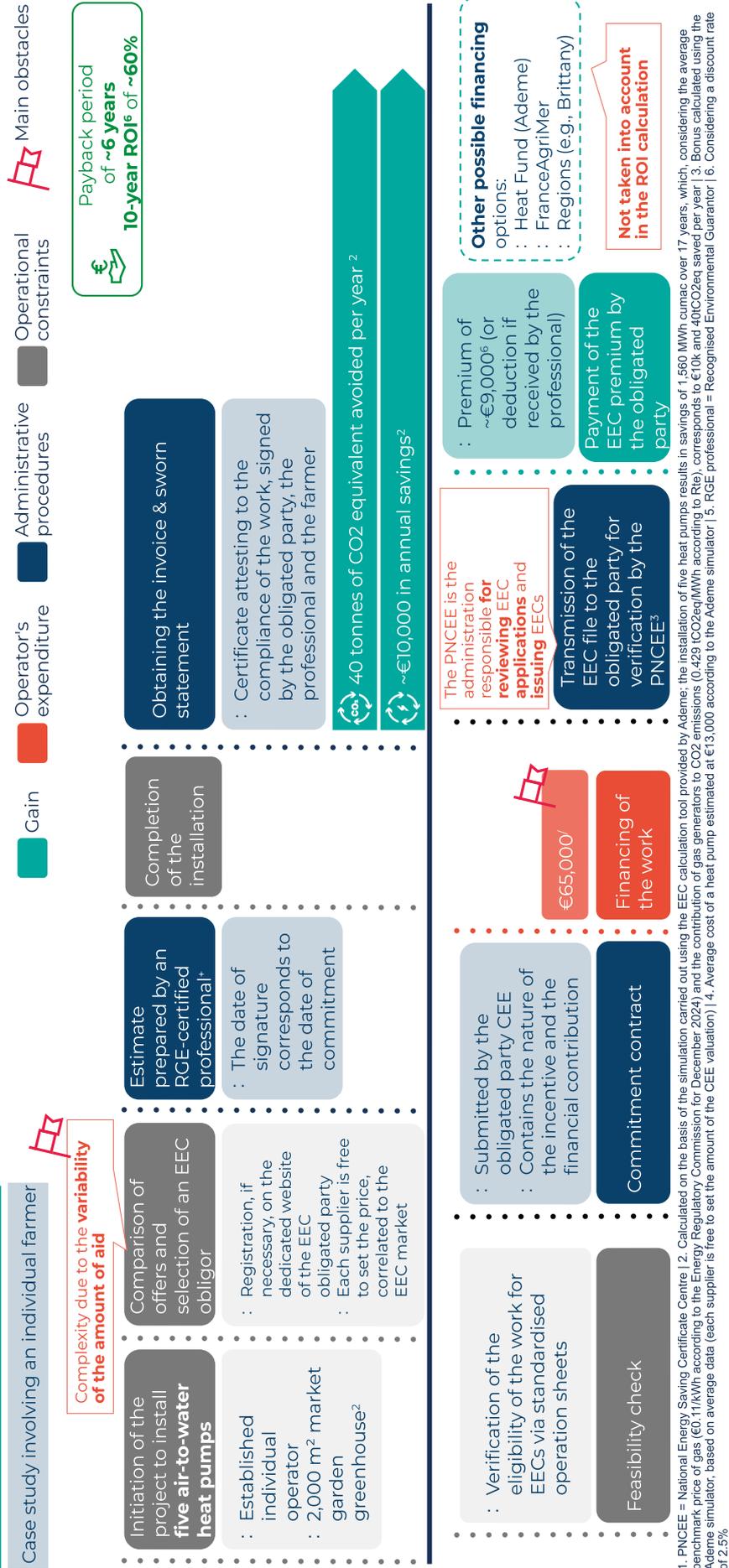
94 See the EDF Solutions Solaires page entitled "The self-consumption premium in 5 questions": [link](#)

95 "Agricultural photovoltaic assistance: official premiums and subsidies", October 2024, [link](#)

96 "Agricultural photovoltaics: profitability in 2023", September 2023, [link](#)

97 "Photovoltaic panels on agricultural buildings: everything you need to know", September 2023, [link](#)

Energy efficiency measures – Installation of five heat pumps in a vegetable greenhouse



1. PNCEE = National Energy Saving Certificate Centre | 2. Calculated on the basis of the simulation carried out using the EEC calculation tool provided by Ademe; the installation of five heat pumps results in savings of 1,560 MWh cumac over 17 years, which, considering the average benchmark price of gas (€0.11/MWh according to the Energy Regulatory Commission for December 2024) and the contribution of gas generators to CO₂ emissions (0.428 tCO₂e/MWh according to Rta), corresponds to €10k and 40tCO₂e saved per year | 3. Bonus calculated using the Ademe simulator, based on average data (each supplier is free to set the amount of the CEE valuation) | 4. Average cost of a heat pump estimated at €13,000 according to the Ademe simulator | 5. RGE professional = Recognised Environmental Guarantor | 6. Considering a discount rate of 2.5%

The specific nature of agrivoltaics

Agrivoltaic projects also contribute to the development of renewable energies. According to the definition introduced by the aforementioned Renewable Energy Acceleration Act, it is an installation *"whose modules are located on an agricultural plot where they contribute sustainably to the establishment, maintenance or development of agricultural production."*

By prioritising the maintenance of significant agricultural activity while also enabling energy production, agrivoltaics offers a second benefit as a solution to climate change. Installing solar panels above

agricultural crops protects them from bad weather, such as hailstorms or extreme temperatures. It can even sometimes improve crop yields by limiting evaporation and therefore water requirements. This technique also helps to preserve and enhance the value of agricultural land, including in areas of decline, where farmers are struggling to survive⁹⁸.

However, unlike rooftop solar panels, agrivoltaic systems are not eligible for self-consumption subsidies, such as the self-consumption bonus or the feed-in tariff (solar FIT)⁹⁹.

CASE N° 1.B. ENERGY EFFICIENCY: INSTALLATION OF HEAT PUMPS IN A VEGETABLE GREENHOUSE

One of the flagship measures for decarbonising energy consumption is the implementation of Energy Saving Certificates (ESC), which contribute €4 to €5 billion per year to the financing of the energy transition¹⁰⁰. This scheme, created in 2005 by the POPE law, aims to help any individual or legal entity to implement energy-saving measures. The distinctive feature of this aid is that it comes from private actors covered by the EEC scheme (known as "obligated parties"), rather than public actors, and it makes no distinction between the different legal forms of its beneficiaries¹⁰¹.

Under this scheme, the public authorities require energy sellers, known as "obligated parties", to achieve energy savings. These parties can therefore obtain EECs either by directly implementing energy-saving measures or by purchasing EECs from actors who have implemented such measures. Obligors are therefore encouraged to encourage their customers to make virtuous investments.

Between 1 January 2022 and 31 August 2024, EECs issued in the **agricultural sector accounted for nearly 2% of all EECs issued**¹⁰². Within this sector, they mainly concern **greenhouse growers, whose activity accounted for 95% of EECs issued in agriculture in 2018**¹⁰³.

98 "Agrivoltaics: principles and advantages of using solar panels for agriculture", May 2021, [link](#)

99 "Agricultural solar trackers: how they work, costs and benefits", August 2024, [link](#)

100 According to the C2E Market marketplace for trading EECs: [link](#)

101 "Questions and answers about the EEC scheme", December 2024, [link](#)

102 Newsletter "Energy Saving Certificates" September 2024, [link](#)

103 "Greenhouse dossier: the energy efficiency bonus", October 2018, [link](#)

Standardised operation sheets, an essential link in the EEC chain, have been defined by decree, setting out the criteria to be met and a theoretical level of expected savings, expressed in a specific unit, the "**cumulative and discounted kilowatt hour**" (kWh cumac), to measure long-term efficiency. The "Agriculture" sector thus has 26 sheets, most of which are classified in the "**Equipment**" category ("Greenhouse wall insulation", "Water storage for a bioclimatic greenhouse", "Stop & Start for motorised agricultural vehicles," etc.) and "**Thermal**" ("Thermodynamic dehumidifier for greenhouses," "Air-to-water or water-to-water heat pump," "Heat recovery unit for milk tanks," etc.)¹⁰⁴.

ADEME provides a simulator that can be used to calculate the value of these EECs and the savings generated by implementing the projects associated with these sheets. For example, according to the simulator, installing five heat pumps in a 2,000 m² vegetable greenhouse would qualify for a subsidy of around €10,000, covering 14% of the cost of the work. This calculation is based on an estimated EEC sale price of €6/MWh cumac, to be applied to the project's estimated 1,560 MWh cumac¹⁰⁵. Based on this level of expected savings over 17 years (the conventional lifespan of the installation¹⁰⁶), the annual savings can be estimated at around €10,000.

Although the value of these EECs fluctuates depending on the market and energy suppliers, it nevertheless reflects the balance between supply and demand. The latter is all the higher as the total obligation increases, as in 2022 when it was raised to 3,100 TWhc of savings by the government, an increase of 24%¹⁰⁷, as part of the new "energy sobriety" plan.

From the operator's point of view, the EEC scheme appears, at first glance, to be virtuous, despite the complexity introduced by the variability of the amount of aid and the technical solutions to which it applies, which are defined administratively, and its method of calculation. However, as it is financed by energy companies, there is a risk that they will pass on the cost of the EECs to energy prices, with the same effect as a tax. This additional cost was estimated at €180 per year for each household in a study by Artelys for Ademe¹⁰⁸.

This scheme can be combined with other forms of assistance. For example, the Heat Fund can be combined with EECs¹⁰⁹. To do so, the project leader must describe the expected impact of EECs on the project's economy prior to its review, so that Ademe can take this into account. Investment aid schemes were also made available in 2024 by FranceAgriMer at national level and in certain regions, such as Brittany, through the "AGRI invest" support programme¹¹⁰.

104 "Standardised energy saving operations" (updated regularly) [link](#)

105 Link to the simulator provided by Ademe for estimating the EECs that can be recovered in the context of energy efficiency projects: [link](#)

106 According to the standardised data sheet for this type of installation: [link](#)

107 "No increase in the EEC obligation in 2025: what impact will this have on the market?", January 2024, [link](#)

108 "Contribution of the EEC scheme to the obligations of the Energy Efficiency Directive", April 2024, [link](#)

109 In accordance with Decree No. 2019-1320 of 9 December 2019 and its order: [link](#)

110 According to the website of the Brittany Regional Chamber of Agriculture, "Investment aid: schemes open in June 2024", [link](#)

Conversion of agricultural machinery – Acquisition of a bioNGV tractor

Case study involving a farmer who does not use methane production

Gain Farmer's expenditure Administrative procedures Operational constraints Main obstacles

Initiation of the bioNGV tractor acquisition project

Established individual farmer
Large-scale cereal farming on 70 ha

Having a **BioNGV station nearby** is the first constraint to the project's implementation (~350 stations in France¹), especially since **the range (~5 hours)** is half that of the diesel equivalent

Dealer quote

Quote of €150,000 – €180,000*
* +25% compared to the diesel model)

Purchase of the tractor from the dealer

Financing through a loan

€150,000 – €180,000

Submission of the single payment application

Approval from France AgriMer

Savings achieved over 15 years compared to an equivalent diesel tractor² :

- 70 ha: ~€25k
- 150 ha: ~€55k
- 350 ha: ~€130k

Reduction of ~11% to ~80% in GHG emissions³ compared to the diesel model, or even a negative balance (depending on the origin of the methane)

Reduction in energy bills of ~20%
The savings achieved range from 30%⁴ to 20% if we consider the TICPE deduction⁵, which reduces the cost differential between GNR and Bio-CNG.

Information on France Agri Mer

Relay by the Chambers of Agriculture

Call for projects under the **France 2030** programme, in 2023, closing in 2024 for bioNGV tractors.

If the subsidy is not renewed, the economic interest in the project is significantly less attractive compared to a conventional tractor.

Approval by France AgriMer
Date and deadline for purchase authorisation

€30,000 – €35,000 (20% of the cost excluding VAT)

Payment of the subsidy

1. Average size of farms in mainland France in 2020: 69 ha (Agreste). First category in terms of number of farms: Large-scale cereal farming | 2. New Holland T6 Methane Power model compared to the equivalent diesel model (La Tribune article, July 2024, "Energy transition: a farm in France-Comté tests a tractor powered 100% by biomethane"). | 3. Variations depending on the origin of the methane (-11% CO2 emissions with fossil methane, -180% with biomethane from energy crops, and even a negative carbon footprint with biomethane produced from livestock manure). [Data from the New Holland T6 180 Methane Power brochure] | 4. Up to 30% cost reductions [Data from the New Holland T6 180 Methane Power brochure] | 5. ROI calculation based on a discount rate of 2.5%, taking into account the TICPE deduction | 6. According to "Panorama du bioGNV 2024: les principaux chiffres de la filière" (Overview of bioNGV 2024: key figures for the sector) published by Gaz-Mobilité in July 2024 | 7. TICPE = Domestic Consumption Tax on Energy Products; professionals in the agricultural sector benefit from a partial refund of this tax (approximately €0.2/litre in 2024)

CASE N° 1.B. DECARBONISATION OF MACHINERY: CONVERSION OF AGRICULTURAL MACHINERY TO BIOFUELS, BIOGAS OR IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES

The aim here is to assess the cost difference between purchasing a conventional machine and investing in more efficient machines or alternative energies. Several alternative energies exist: BioNGV, biofuels such as B30 or B100, electricity, hydrogen and HVO. HVO could play an important role in the medium term, as it appears to be a solution for decarbonising machinery that is difficult to electrify without requiring engine conversion. These machines can also meet a need linked to changing practices (e.g. seed drills for planting under cover crops vs. seed drills on bare soil). The issue of agricultural machinery must therefore be linked to the issue of how it is used. Ecological agriculture may involve different practices than ploughing the land. It is also worth mentioning the economic models for sharing agricultural equipment, such as agricultural equipment cooperatives (CUMA)¹¹¹. Finally, a machine purchased today may still be in service in 2050. The purchase of new machinery is therefore not the only lever; retrofitting is also necessary (replacing one engine with another, for example from thermal to electric for smaller machines). For the case study, we will examine the acquisition of a BioNGV tractor.

The purchase of a BioNGV tractor makes it possible, through the use of an alternative fuel (NGV, or "Natural Gas for Vehicles"), to decarbonise the energy consumption of agricultural machinery, while generating economic benefits for the operator.

NGV is the name given to natural gas when used as a fuel for mobility, and includes both CNG (compressed form) and LNG (liquid form). BioNGV, with which gas vehicles are compatible, has the same characteristics as NGV, but is produced locally from the methanisation of organic waste. From an environmental perspective, there is an 11% reduction in CO₂ emissions with fossil methane, compared to 80% with biomethane from energy crops. When biomethane is produced from livestock manure, its carbon footprint is even negative (producer information)¹¹².

According to economic modelling, the operation is attractive to farmers as it enables them to achieve fuel savings of around 30% (producer estimates)¹¹³, which are all the more significant in terms of total cost the larger the farm area. A 20% subsidy from FranceAgriMer in 2023 brought the cost of the tractor down to the same level as that of an equivalent diesel model, which made it easier to choose BioNGV. This aid was offered to farmers, but also to organisations such as agricultural contractors and cooperative machinery associations.

Beyond the savings generated, investing in a BioNGV tractor can enable a farmer to free themselves from the vagaries of diesel prices. This is particularly true for farmers with biogas plants, as the cost of supplying biomethane is then reduced

111 For example, see: <https://ouest.cuma.fr/changement-climatique/>

112 New Holland T6 MethanePower tractor brochure (model eligible for FranceAgriMer subsidy): [link](#)

113 New Holland T6 MethanePower tractor brochure

to the cost price of biogas production¹¹⁴. ADEME has therefore introduced a subsidy to support this local distribution method, covering 70% of the eligible cost of the supply network. However, at present, only a fraction of farmers in France are affected, with 350 private pumps recorded at the end of 2023¹¹⁵.

Several obstacles to the widespread adoption of these solutions

Despite its clear advantages, the deployment of this solution faces several structural obstacles, which are primarily operational. Firstly, an alternative energy tractor (in the case study, the New Holland T7) comes with a number of constraints in terms of possible modifications, range, size, etc. The decarbonised offering is limited from this point of view, and it can therefore be more difficult to find a tractor that is suited to the farm's needs.

Furthermore, although these infrastructures have benefited from various support schemes since 2016, at the end of 2023 there were just over 350 BioNGV/NGV refuelling points open to the public¹¹⁶. This insufficient network across the country is a constraint, due to the additional time and effort required for refuelling. Ultimately, these constraints can lead to additional costs and therefore a decrease in the return on investment. This is all the more of a hindrance given that these vehicles have a shorter range – around 5 hours, or half that of a diesel equivalent¹¹⁷.

From a financial perspective, this solution is less attractive given the economic advantage of the government's exemption from taxation on non-road diesel fuel. In fact, the calculation of savings must take into account the reimbursement to farmers of part of the taxes on GNR when they use a diesel model (€0.21/litre, out of the €0.25/litre tax proposed in 2024)¹¹⁸. In the case studied, where this parameter is taken into account, the savings generated by using the BioNGV tractor are slightly less than 20%, whereas the manufacturer claims savings of 30%.

Finally, the lack of structural financial support may slow down the roll-out of this model, as operators are dependent on the annual renewal of subsidies. Indeed, the 20% subsidy offered by FranceAgriMer in this illustrative case was a one-off measure, open until the end of 2023 and subject to the availability of funds (planned budget of €40 million)¹¹⁹. In general, the current model for subsidising agricultural equipment, based on one-off, time-limited calls for projects, lacks consistency. This form of subsidy often proves to be a windfall effect, which also leads to price increases and over-equipment (farmers waiting for subsidies to buy equipment).

114 "Agricultural BioNGV: ADEME financial aid for stations", June 2023, [link](#)

115 "BioNGV overview 2024: key figures for the sector", July 2024, [link](#)

116 "BioNGV overview 2024: key figures for the sector", July 2024, [link](#)

117 "Energy transition: a farm in Franche-Comté tests a tractor powered entirely by biomethane", July 2024, [link](#)

118 "End of the advance on the GNR tax: who is affected and how can they benefit?", July 2024, [link](#)

119 See the decision of the Director General of FranceAgriMer of 2 March 2023: [link](#)

There are other options for decarbonising energy consumption beyond replacing existing machinery with alternative fuel engines. One such option is to retrofit existing machines to accommodate new engines without replacing the entire fleet. However, this solution is hampered by the wide variety of agricultural machines manufactured in very small series, as well as regulatory constraints. The pooling of equipment between farms, based on the CUMA or ETA model, is an interesting avenue to explore, but it is not compatible with equipment needs at a given date (sowing, harvesting, etc.).

A report published by the CGAAER in 2022 highlights that implementing these levers could lead to reductions in energy consumption on farms of around 10 to 15%¹²⁰.

CASE 2: TRANSITION IN LIVESTOCK FARMING

The transition in livestock farming involves reducing methane emissions from animals, developing carbon sinks and protecting biodiversity (through the development and management of permanent grassland and hedgerows).

Several agricultural practices exist in livestock farming to reduce methane emissions from a given herd, based on very different development models. On the one hand, there are models based on intensification (optimised herd management, optimised feeding, widespread use of methanisation, etc.) or extensification (switch to grassland models and development of carbon sinks, change in cattle feed, livestock selection, calving age, reduction in herd size, mixed farming, etc.). Political choices between models can vary greatly and the impact on the environment can be ambivalent depending on the criteria chosen: while some models focus on reducing GHG emissions, others also promote biodiversity protection and adaptation to climate change.

Thus, in the following cases, we are studying the installation of a methanisation unit for the recovery of effluents. More specifically, we are focusing on the decarbonisation of pork production in Brittany, which combines methanisation, feed optimisation and the decarbonisation of energy consumption. A final case concerns the development of a cattle farm based on a grassland model, supported by funding from agri-environmental and climate measures (AECM) under the Common Agricultural Policy.

¹²⁰ "Decarbonising 100% of the energy used in agriculture by 2050: it's possible!", April 2022, [link](#)

CASE N° 2.A. AGRICULTURAL METHANISATION: INSTALLATION OF A METHANISATION UNIT

This case covers issues relating to the acquisition of methanisation units, pit covers, operation, and the use of biogas and digestate (the residue from anaerobic digestion). As a circular economy model, agricultural methanisation is an environmentally friendly solution for the recovery of agricultural waste (whether animal effluent or plant waste). Biogas can thus be recovered as an energy source and digestate as organic fertiliser. The economic balance of the agricultural operator for such an installation must be assessed.

More and more farmers are choosing to embark on methanisation projects. In 2023, GRDF announced that the number of agricultural methanisation plants is expected to more than double in two years, bringing the number of biomethane production units to over 1,300¹²¹.

Admittedly, this model is not accessible to all farmers, given the high investment required – around €3 million for a 50 Nm³/h injection unit¹²² – and the constraints and high costs involved in its operation. However, for those considering this conversion, the investment can be recouped relatively quickly – in as little as seven years in the case studied – and has the advantage of offering stable revenues, especially since green gas has been revalued twice, in 2022 and 2023, for a total increase of 18%¹²³. This support from the public authorities has encouraged the trend towards direct injection methanisation rather than cogeneration¹²⁴.

The operator is supported in their project by GRDF, which can help them carry out a preliminary study to quickly assess the feasibility of the project, including the distance to the network, the size of the project and the capacity of the network. The Chambers of Agriculture can also assist farmers at all stages of the project (design, preparation of the ICPE file, monitoring of construction and commissioning, etc.).

From a financial point of view, the main support is provided by ADEME, in the form of a flat-rate subsidy per unit of annual production capacity. The amount of aid is €45/MWh for injection¹²⁵, which represents €225,000 in the case of a methanisation plant with an injection capacity of 5GWh/year. ADEME also offers aid for preliminary studies, which can represent 60 to 80% of eligible expenditure (capped at €50,000 for diagnostic studies and €100,000 for project support studies)¹²⁶. In addition, the government has defined the concept of "injection rights", which allows gas networks to be shared between producers in order to reduce connection costs, as well as covering up to 60% of these costs, up to a limit of €600,000¹²⁷.

121 "The number of methanisation plants will double in two years", October 2023, [link](#)

122 "Methane injection: "Now is the time to get started!", September 2019, [link](#)

123 "The number of biogas plants will double in two years," October 2023, [link](#)

124 Cogeneration enables electricity and heat to be produced locally, while injection enables biomethane to be produced remotely and on a larger scale; profitability is generally higher in the latter case: [link](#)

125 See the dedicated page on the Ademe website: "Construction of methanisation facilities (injection, cogeneration, heat)": [link](#)

126 "Support for studies on bio-waste management by economic actors", [link](#)

127 "With the revaluation of feed-in tariffs, green gas is on the rise", January 2024, [link](#)

Figure – Sequencing of an agricultural methanisation project

source: Méthanormandie



Once commissioned, the facility guarantees the farmer a stable additional income, enabling them to cope with fluctuations in agricultural markets. The purchase price of biomethane is guaranteed by the State for 15 years from the date the facility is commissioned¹²⁸. In addition, other sources of income may be added to the sale of biogas: heat recovery (sale and heating savings), digestate (sale and fertiliser savings), and in some cases waste treatment.

While this solution is attractive in terms of profitability, the day-to-day operation of a biogas plant comes with significant operational and financial constraints.

¹²⁸ According to the GRDF website page dedicated to methanisation "State-supported biomethane purchase price with open access": [link](#)

The supply of inputs to the biogas plant is a key factor in its efficiency. To be profitable, it must be constantly supplied with organic matter. In France, this feedstock is largely provided by livestock manure and intermediate energy crops (CIVE), with only 4% coming from dedicated crops (). Livestock manure has a lower methanogenic potential than plant matter, resulting in lower biogas production for an equivalent tonnage. Non-agricultural materials can also be added in line with the circular economy approach, which may give rise to waste treatment fees, but also, in some cases, to expenses, which can weigh on economic performance¹²⁹. The AAMF has warned of problems with input availability in 2022, stating that this issue will become increasingly critical¹³⁰.

The increase in electricity prices can also cause significant economic difficulties for biogas plant operators, given the substantial energy requirements of these facilities, as was the case in 2022. The AAMF pointed out at the time that "as soon as the electricity bill triples, the margin for biogas plants drops to €0"¹³¹. Added to these costs are expenses related to maintenance, labour, annual injection station fees, periodic biomethane analyses and other investments.

Finally, it should be noted that, like any industrial process, adopting this solution is not without risk, as methanisation can sometimes cause fires, explosions or poisoning. Furthermore, if certain safety rules are not strictly observed – in particular strict compliance with a digestate spreading plan – the facility can cause serious environmental pollution. For example, the overflow of a methanisation plant in Châteaulin in 2020 polluted a watercourse with ammonia, depriving 180,000 people of drinking water for several days¹³².

Testimonial from Valentin Lemierre, a dairy farmer based in Liffré, Brittany

"In 2009, I launched a methanisation project, one of the first in western France. At the time, I had 180 dairy cows and needed to bring my farm's effluent management up to standard. Rather than simply building a pit, I decided to recycle the effluent by installing a methanisation system to feed the gas produced back into the grid.

This system allows me to produce around 200 cubic metres of gas per hour. In addition to the effluent from my cows, I also collect waste from my farming neighbours and the town of Liffré.

This represents a significant additional income, as methanisation accounts for 60% of my turnover. However, I would like to rebalance this share with my main activity by diversifying into meat production.

For my first project, I received a large grant from Ademe, which enabled me to see it through, with financial support from my bank for the rest. For my second project, I did not receive a grant and had to finance it myself with the help of my bank. But this time, I had fewer doubts about the financial viability of the project, as the key factor is to be sure of having enough waste, and I now have the necessary partnerships for this.

¹²⁹ "Profitability to be consolidated", November 2018, [link](#)

¹³⁰ See the AAMF report on the PRODIGE 2 webinars of 18 and 20 May 2022: [link](#)
The AAMF is the Association of French Methanisation Farmers.

¹³¹ "Rising costs: trouble brewing for methanisation plants", October 2022, [link](#)

¹³² "Pollution of the Aulne: those responsible for the Châteaulin methanisation plant convicted", November 2023, [link](#)

CASE N° 2.A.BIS DECARBONISATION OF PORK: REDUCING METHANE EMISSIONS IN BRETON PIG FARMING

Produced in collaboration with La Cooperl, this case study focuses on the decarbonisation of pork. It shows that reducing GHG emissions (mainly methane) requires a combination of different levers : methanisation, feed optimisation and decarbonisation of energy consumption. Together, these levers can almost halve the carbon impact of pork. Developed by Cooperl, this case study demonstrates the central role of cooperatives in providing solutions to farmers and the specific regional characteristics that must be taken into account.

Pig farming in Brittany – Optimising feed and using agricultural methanisation

Payback period of ~20 years
 € = energy revenues finance the overall transition

Case study of a pig farming operation in Brittany

- Additional gain
- Cost additional
- Administrative procedures
- Initial level of costs/income
- Main obstacles

Initiation of the transition project

- Individual non-young farmer
- Breeding and fattening pig farm in Brittany (242 sows, 1,615 places)⁰

Optimisation of animal growth	Implementation of a precision feeding system	Frequent effluent removal (V-scraping)	Methane production using Nénufar cover, boiler and photovoltaic panels	Other changes in practices: PBE ⁶ , switch to sustainable soy, valorisation of co-products from the "5 ^e quartier du porc" (50% of the pig's diet), reduction in cereal nitrogen input, hedge management, etc.
Optimised effluent management	Biogas and electricity production			

Remaining balance

- ~€160,000
 - ~€100/place
 - 100% out-of-pocket expense (no assistance or subsidy)
- ~€200,000⁷
 - ~€100 - €150/place
 - 100% out-of-pocket expense (no assistance or subsidies)
- ~€200,000
 - Of the ~€100K related to methanisation, 40% subsidy⁴

Payment for installations

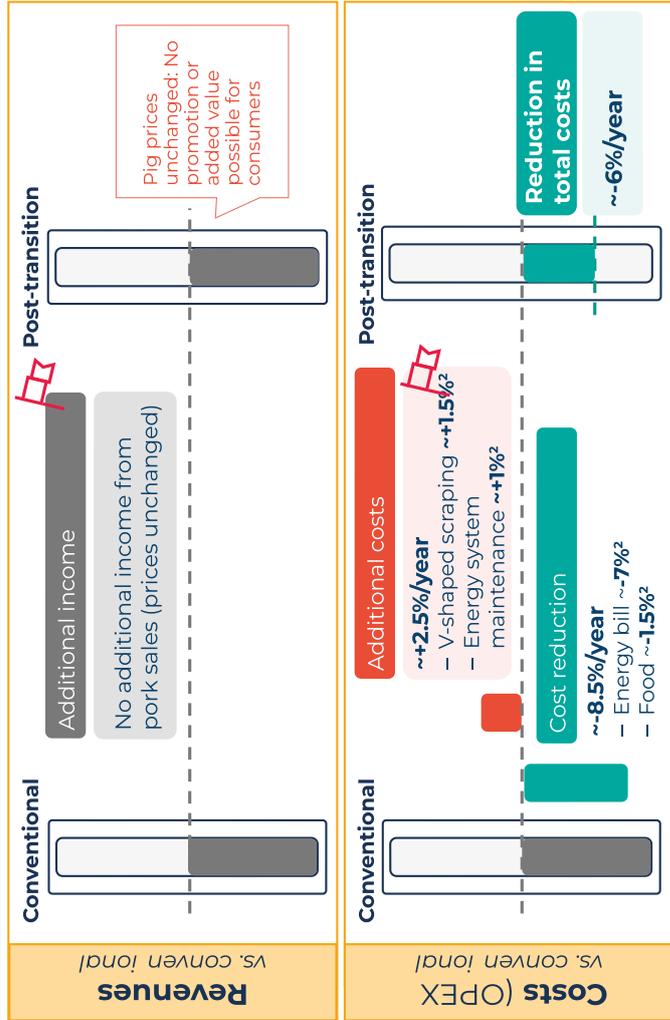
financing by

- Bank loan
- Subsidised rate of \$3<+4

~€560,000

Implementation of transition practices

30-50% reduction in GHG emissions compared to conventional farming*



Key figures for agriculture in the Brittany region¹³³

As France's leading producer of eggs, milk, vegetables and organic produce, as well as pork and poultry, Brittany is capable of feeding 20 million consumers despite having a population of only 3.4 million. Brittany is a region mainly focused on livestock farming (84% of farms are dedicated to animal production), with 60% of national pig production coming from Brittany, 23% of milk production and 33% of poultry production. Brittany therefore has an "export" vocation to other regions nationally and internationally.

There are 26,300 farms in Brittany:

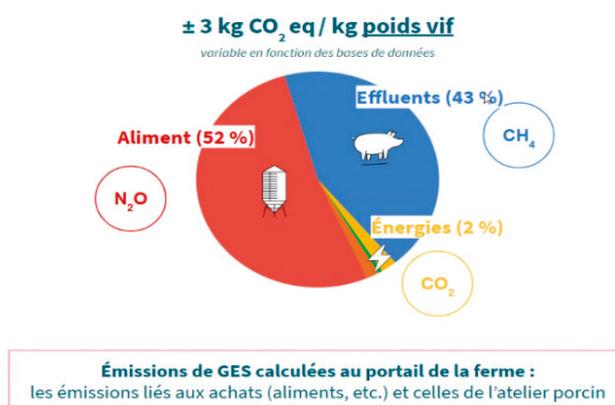
- 66,670 agricultural workers (entrepreneurs and employees)
- 2,000 are to be transferred each year.
- 62% of Brittany's land area is usable agricultural land.
- 7,550 are committed to a quality approach (including organic certification for around 3,000 farms)

Brittany is also the leading employment area for the agri-food industry:

- 1,000 companies are involved in agricultural production, with a comprehensive organisation of the sector ranging from seed production and plant protection products to processing industries.
- 70,000 employees (40% of industrial jobs in Brittany)
- €21 billion in turnover.

Cooperl, a pig farming cooperative in Brittany, has identified several levers to achieve its goal of decarbonising its production by 2050¹³⁴. The goal of decarbonising the pig industry by 2050 is a 46% reduction in GHG emissions. The average carbon footprint of a pig "at the farm gate" (including upstream and breeding) is 3kg of CO₂eq/kg of live weight, 52% of which is linked to feed, 43% to effluents and 2% to energy.

Figure – Carbon footprint of pork and associated GHG emission sources
source: Cooperl



¹³³ <https://www.bretagne.bzh/actions/economie-emploi/agriculture-agroalimentaire/> and <https://bretagne-environnement.fr/article/>

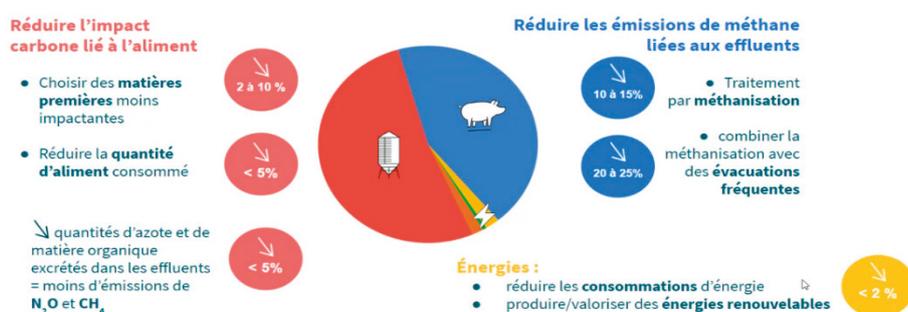
¹³⁴ The figures presented here are taken from the work of Cooperl.

Various levers for reducing GHG emissions exist for each of these items:

- The levers identified in the feed sector could reduce the carbon impact by 12-20%: purchasing low-carbon feed, integrating co-products from the food industry, precision nutrition and optimising a pig's feed throughout its lifetime.
- In terms of effluent management, a 20-25% reduction in emissions is possible through the treatment of effluents by methanisation (installation of small methanisers on the farm – "Nénufar" technology) combined with more frequent effluent removal to prevent bacteria from affecting the material and causing ammonia emissions (cleaning robots – "V-scraping").
- Reducing energy consumption and producing renewable energy would reduce emissions by 2%.

Figure – Main levers for reducing GHG emissions from pig farming

source: Cooperl



Although these projects can help reduce GHG emissions, **they are not very profitable for farmers**: they represent an additional investment cost that is not currently subsidised (except for "Nénufar" technology). These investments do not ultimately lead to any increase in the price of pork, as there are no well-known national labels for pork and willingness to pay remains limited. However, optimising pig feed and recovering biogas are sources of savings and income for farmers. **Loans are the only real source of financing** for these transition measures.

According to Cooperl, the **costs required to achieve these objectives** represent approximately **+€0.10/kg of live weight**. This increase is equivalent to doubling the cooperative's total cumulative premiums (antibiotic-free farming, etc.). These additional costs **cannot be borne entirely by the cooperative and would not be accepted by customers today**. These investments are therefore generally very unprofitable and cannot be made without a price increase or third-party financial support.

CASE N° 2.B. SOIL HEALTH: CHANGING AGRICULTURAL PRACTICES IN LIVESTOCK FARMING TO REDUCE EMISSIONS AND PROMOTE CARBON STORAGE AND BIODIVERSITY¹³⁵

This case covers changes in practice through extensification (switch to grassland models and development of carbon sinks, changes in cattle feed, choice of livestock, calving age, reduction in herd size, mixed farming, etc.). Beyond the secondary reduction in GHG emissions, these practices primarily enable the development of carbon sinks (through the development and maintenance of permanent grasslands and hedgerows), the protection of biodiversity and adaptation to climate change. It focuses on the use case of a suckler cow farming d on a grassland model supported by funding from agri-environmental and climate measures (AEEM).

Improving livestock farming practices appears to be one of the main levers for agricultural transition. Although cattle emit methane, a greenhouse gas that is around 28 times more potent than CO₂¹³⁶, some of these emissions could be offset by better practices aimed primarily at increasing carbon storage in grasslands.

Unlike the Low Carbon Label, which has been criticised for not sufficiently rewarding the efforts made, the Agri-Environmental and Climate Measures (MAEC) aim to fully offset the costs incurred by farmers. Co-financed by the European EAFRD fund and the State, and subscribed for a period of five years, MAEC remuneration is calculated precisely on the basis of additional costs and lost income, with a view to compensating farmers for their financial outlay. These values are publicly available at¹³⁷. MAEC measures support the development and maintenance of virtuous practices.

It should nevertheless be noted that this aid, most of which depends on the area committed, is intended to compensate farmers for the costs incurred. On the one hand, there is a cap on this aid and, on the other hand, farmers rarely take the risk of committing all eligible areas to a given measure. For example, although in some regions the MAEC Species Protection measure can yield up to approximately €250 per year per hectare¹³⁸, most farmers prefer to commit only small areas. The €7,000 ceiling for this measure is therefore rarely reached.

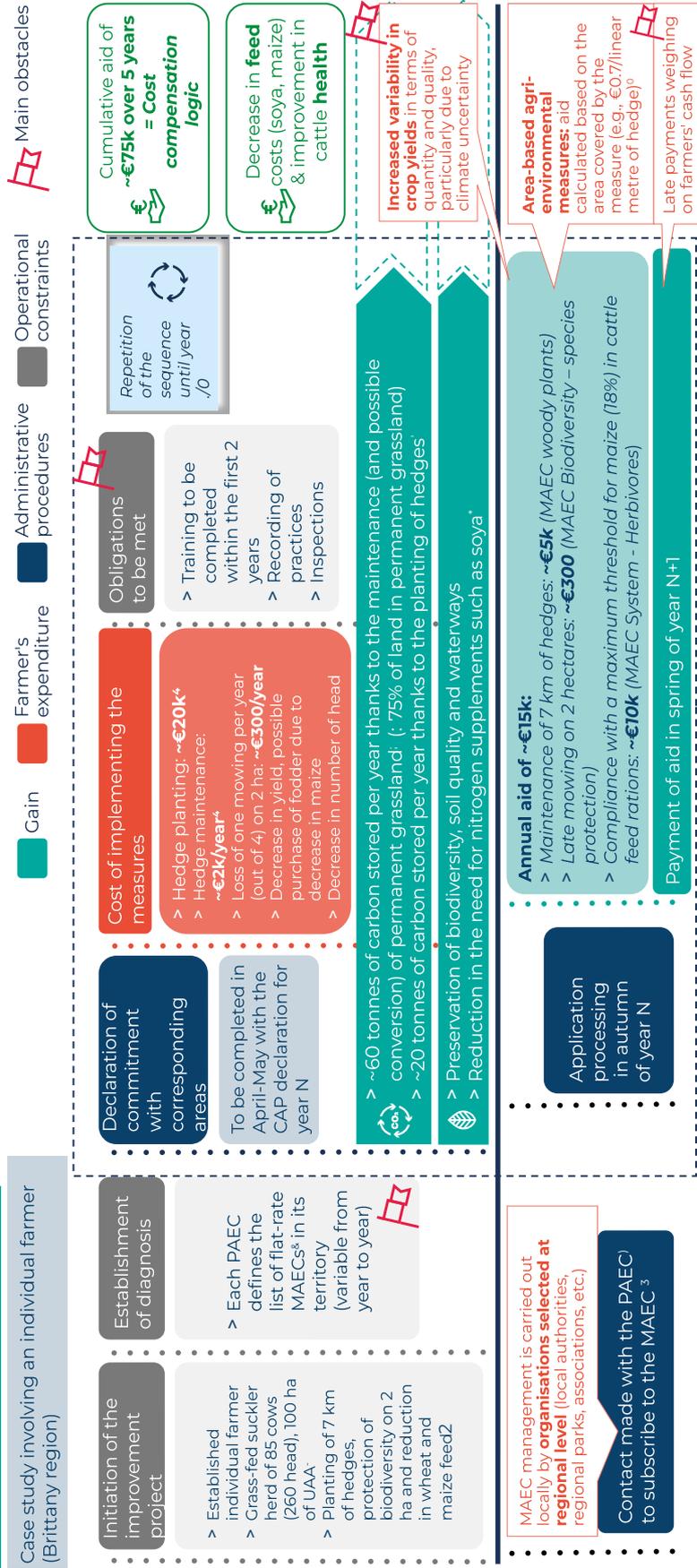
¹³⁵ Particular mention should be made of the studies conducted by INTERBEV, the representative organisation for meat producers, and CNIEL, the professional dairy organisation. These organisations have chosen to tackle societal issues by working on both the image and practices of their sectors.
<https://www.interbev.fr/fiche/strategies-climatiques-bovine-et-ovine-contribution-varenne-de-leau/>
<https://www.cniel.com/le-cniel-en-actions/environnement>

¹³⁶ See the INRAE report on "The carbon footprint of livestock farming", August 2024, [link](#)

¹³⁷ The specifications are available in the appendix to the CAP national strategic plan, [online](#)

¹³⁸ This is the case in the Bay of Douarnenez (Finistère): [link](#)

Cattle farming – Improving practices on a grassland beef cattle farm



From an environmental perspective, MAECs address carbon storage issues, mainly through payments for maintaining permanent grassland, which stores an average of 0.76 tonnes of carbon per hectare per year¹³⁹. Other MAECs promote the planting and maintenance of hedges, which, according to the OFB, can store up to 3 tonnes of CO₂ per year per kilometre¹⁴⁰.

The MAEC scheme is particularly appealing as it addresses broader issues than just reducing carbon footprints, such as preserving biodiversity and the quality of soil and waterways. Some measures can have multiple beneficial effects: for example, respecting a maximum threshold for maize in cattle feed reduces the need for nitrogen supplements such as soya, which are often imported and whose production is harmful to the environment. In addition, in some cases, farms can convert land previously used for maize production back into grassland.

It is important to note, however, that these changes in practices may lead to greater variability in crop yields in terms of quantity and quality, increased dependence on climatic conditions, and impacts on production. These changes are accompanied by an increase in production risk, which must be taken into account in the economic balance of these projects.

This solution is currently still unevenly deployed, and the aid granted fluctuates from year to year. Indeed, this scheme is not offered to farmers in a uniform manner across the country. The DRAAFs (Regional Directorates for Food, Agriculture and Forestry), which report to the regional prefect, define the areas in which MAECs can be opened. As a result, MAECs are not available throughout the country, but only in areas facing specific challenges, with "system" MAECs covering less than 5% of the UAA.

Calls for projects are then launched for operators (e.g. a chamber of agriculture wishing to open an MAEC for maintaining livestock farming). Each operator draws up an agro-environmental and climate project (PAEC), which details the measures proposed to farmers. In addition to territorial disparities, the measures and budgets vary from year to year.

This lack of visibility is exacerbated by delays in the payment of CAP 2023 subsidies, linked to IT problems that occurred during the launch of the CAP 2023-2027 cycles and which led to criticism of the government. These conditions for managing CAP subsidies lead, on the one hand, to cash flow difficulties and, on the other hand, may send negative signals about the long-term support available to farmers who are embarking on a process of improving their practices.

139 Soussana, J.F., Klumpp, K., & Ehrhardt, F. (2014). The role of grassland in mitigating climate change. Grassland Science in Europe, [link](#)

140 "Offsetting CO₂ emissions and adapting through nature-based solutions", August 2023, [link](#)

Testimonial from Adeline Yon-Berthelot, cattle farmer in the Côtes d'Armor region using a grassland model

"As part of my work as a farmer, I benefit from several MAECs: the MAEC bocagère (which subsidises the planting of shrubs and hedges), the biodiversity MAEC (which subsidises leaving wet strips, tall grass or late mowing), and in particular the system MAEC (which subsidises the fact that my cattle's feed contains less than 18% maize). In addition, to promote CO₂ capture by my grassland soils, I mow less and therefore allow the grass to grow quite high.

These are 'per-action' subsidies: when you comply with the specifications, you receive cheques for €5,000 or even €10,000. For me, this changes the economic landscape and allows me to continue preserving my grassland model. When I took over the farm from my parents, the farm was already based on this model, but this allows me to go further in terms of good practice. Hedges do require maintenance, which takes a lot of time: for my 8 km of hedges, it can take almost two months of work by one employee over the course of a year. Also, in order to limit my consumption of maize and wheat, I have to leave certain fields and permanent grasslands untouched, which can pose a risk to my

fodder supply. It requires foresight and good management of my grasslands to ensure that they produce the right feed for a balanced diet for my animals.

The MAECs are a very good idea, but there can be significant delays in payment. This year [2024] in particular, the delays are even longer, which is difficult to manage in terms of cash flow. In addition, I have heard that subsidies are going to be reduced, which would make it less attractive."

However, there are other practices that I cannot implement because they are too expensive. For example, my parents also raised pigs, and when I took over, I stopped raising pigs. So I am left with abandoned pigsties that I would have to remove asbestos from before demolishing. I could also switch to organic farming. To switch to organic farming, I would also have to hoe the corn, but I don't have the time, it would cost too much in labour, not to mention the two-year transition period during which I cannot yet sell organic produce and the fact that the market for organic produce is much less attractive today than it used to be."

CASE 3: CROP TRANSITION

Crop transition involves, on the one hand, reducing the use of herbicides and pesticides to protect biodiversity and, on the other hand, reducing the use of mineral fertilisers.

The main source of GHG emissions in crops is nitrous oxide escaping from mineral nitrogen fertilisers. However, fertiliser production also has a significant impact on the carbon footprint of the industrial sector upstream of the agricultural sector. The manufacture of synthetic nitrogen fertilisers accounts for a significant proportion of GHG emissions from the French chemical industry, with 14% of the sector's emissions, totalling around 2.6 MtCO₂e in 2019. Taking into account fertilizer imports, which account for 75% of consumption, emissions are around 10 MtCO₂e¹⁴¹.

¹⁴¹ <https://theshiftproject.org/wp-content/uploads/2024/11/RF-Agri-Rapport-Complet-DEF.pdf>

There are two ways to reduce the carbon footprint of crops: 1) decarbonise energy-intensive nitrogen production; 2) reduce the use of mineral fertilisers, which, by their very use, increase GHG emissions. In terms of scale, the second lever is far more important than the first. While industrial processes exist to decarbonise nitrogen production (but these double the price of mineral fertilisers¹⁴²), this case study will focus on reducing fertiliser use (case no. 3.B.).

CASE N° 3.A. REDUCTION IN PESTICIDES: OPTIMISING THE USE OF HERBICIDES IN FIELD CROPS IN A SUSTAINABLE AGRICULTURE MODEL

In this use case, we are studying the protection of biodiversity through practices that reduce the use of herbicides and pesticides. Pesticides do not directly emit GHGs, but they harm biodiversity and therefore soil health and its carbon storage capacity. Certain technologies make it possible to optimise the use of chemicals so that they target only harmful plants: this is the use case studied below. However, these are not the only technologies available on the market : a range of robotics and biocontrol techniques are currently being developed to reduce pesticide use. There are also many other "natural" levers, such as crop diversity and longer crop rotations¹⁴³, but we will not discuss them here as the economic reality is more difficult to quantify.

Precision farming reduces energy, water and input consumption through the use of new technologies. This model combines data collection tools such as drones, satellites, sensors and weather stations with decision support tools (DSTs), which farmers can access from their computers or smartphones, for example.

In the case studied, the targeted spraying system uses cameras integrated into the spray boom to continuously scan the field. These cameras detect the green colour of weeds. Once the data has been processed and the competing plants to be eliminated have been identified, only the necessary nozzles are activated for targeted spraying. This device significantly reduces the use of herbicides, with savings of up to 70% according to data shared by the manufacturer, while maintaining an efficiency rate of 98%¹⁴⁴. This estimate is consistent with the range identified by the CGAAER report on precision agriculture¹⁴⁵. Savings on plant protection products vary depending on the equipment used and can be as high as 90% in the case of ultra-targeted spraying. However, the CGAAER report points out that "*precision farming is one solution among many and should be used as part of a combined approach incorporating all other options, whether agronomic, genetic or biocontrol, where these exist*".

142 FNSEA hearing

143 For more information on these levers, see the [INRAE summary](#) on the subject

144 Data shared by manufacturer John Deere on the See & Spray Select targeted spraying system: [link](#) – These efficiency rates should be considered optimistic in the sense that they are only achieved if these practices are combined with others, according to scientific literature.

145 CGAAER report, [link](#)

Precision farming – Acquisition of a targeted spraying system for herbicide application

Case study of an individual farmer

< Established individual farmer, wishing to transition to precision farming (large-scale cereal farming, 150 ha), through the acquisition of a targeted spraying system

- < Purchase of a **precision farming kit & targeted spraying system** for a **total amount of €90k**
- < **Assumption:** the operator does not already have the necessary equipment for targeted spraying (e.g., console, receiver)
- < **FranceAgriMer one-off aid** scheme, with subsidies ranging from **20% to 40%** depending on the investment!
- < Recommendation for **40% funding** as part of the **France 2030 and Ecophyto 2030** programmes⁵

Advantages

- < Improved working conditions for the farmer
- < Reduction in phytosanitary product costs
- < Estimated reduction in inputs of 40% to 70%⁷

Time savings not always achieved due to the **emergence of new tasks**

Disadvantages

- < Increased need for training
- < Lack of long-term subsidies
- < Investments difficult to recoup for small/medium-sized farms

To be qualified by the long-term trend towards **expansion of land area**

Additional gain

Additional cost

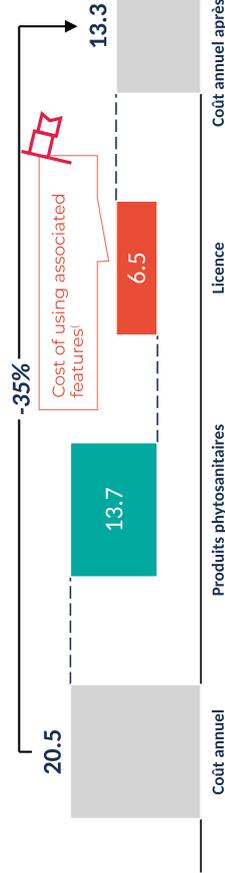
Additional cost

Main obstacles

Implementation of transition practices

Estimated reduction in inputs of 40% to 70%⁷

Annual cost of herbicide spraying (area 150 ha) vs. conventional (€k)



ROI calculation over 10 years	70 ha	150 ha	250 ha
Spraying system investment	€90k	€90k	€90k
FranceAgriMer subsidy	40	40%	40%
Net investment	€54k	€54k	€54k
Annual savings/net cost(s)	-€0.1k	€7k	€16k
Savings/net cost over 10 years¹	-€1k	€63k	€143k
ROI over 10 years¹	negative	16.5%	164%

This system represents an investment of around €90,000, taking into account the other precision equipment required to use this device, such as a console or GPS receiver. In reality, a significant proportion of farmers already have the basic tools necessary for precision farming. According to the Chambers of Agriculture, 46% of farmers use a GPS navigator on their tractor¹⁴⁶. The use of these systems generates annual licence costs that can cover software updates, technical support or data analysis, and which can reduce the benefits associated with lower input costs.

In 2024, this type of device was eligible for a 40% FranceAgriMer subsidy. This €47 million aid programme, launched to encourage investment in equipment that reduces the use of plant protection products, was offered to farmers, agricultural contractors and cooperatives¹⁴⁷. It is possible that similar programmes will continue to be offered in the coming years, although no official information has been released on this subject.

It has been observed that this type of investment is more profitable the larger the area, as the gains made through reduced herbicide use increase with size. In the case studied, and based on the assumptions made, the investment becomes profitable within 10 years for areas of approximately 140 hectares or more, which is twice the average size of a farm in France in 2020 according to Agreste¹⁴⁸. This is one of the criticisms levelled at the precision farming model. Due to the significant investment it requires, only the largest and most specialised farms would be able to benefit from it¹⁴⁹.

However, the impact of this factor can be qualified if we place it in the broader context of a long-term trend towards larger farm sizes. According to a prospective study by INSEE, farms of 100 ha or more will account for 36% of all farms in 2035, compared with 26% in 2020¹⁵⁰.

Furthermore, there are many types of precision farming equipment, and their cost also varies. Many applications offer farm management features, including making the most of satellite monitoring. Farmers can then, for example, identify problem areas anywhere from their smartphone or PC, or access maps colour-coded according to different types of data¹⁵¹.

146 See the publication by the French Chambers of Agriculture dated 24 July 2024 entitled "Managing plots with precision farming": [link](#)

147 "What equipment is eligible for FranceAgriMer's €47 million aid package aimed at reducing the use of plant protection products?", June 2024, [link](#)

148 See the 2020 agricultural census conducted by Agreste: [link](#)

149 This criticism comes in particular from the Fondation pour la Nature et l'Homme (Foundation for Nature and Mankind), which published a note on this subject in September 2020 with Réseau Action Climat (Climate Action Network) entitled "Precision farming: a model that runs counter to ecological and social transition": [link](#)

150 "How many farms will remain in France in 2035?", February 2024, [link](#)

151 Similar to the features highlighted on the home page of the OneSoil website, a free precision farming application: [link](#)

The impact of these technologies on workload is not uniform. While we can expect a reduction in the tasks performed by low-skilled labour, this model requires "more farmers skilled in information and communication technologies (ICT)"¹⁵² according to a study by the European Parliament. New tasks are therefore replacing old ones, which may mitigate the benefit to farmers in terms of reduced working hours.

CASE N° 3.B. REDUCTION IN INPUTS: TRANSITION TO ECOLOGICAL FARMING MODELS THAT LIMIT EMISSIONS LINKED TO THE USE OF MINERAL FERTILISERS AND PESTICIDES

This case includes all practices relating to conversion to organic farming and agroecology: the use of organic fertilisers, the integration of legumes into crop rotation, the extension and diversification of crop rotations, soil regeneration techniques, permaculture techniques, polyculture, etc. It is therefore necessary to study the optimisation of the use of synthetic fertilisers and pesticides. Finally, it is necessary to assess the cost of a transition (which may take several years) from a conventional farm and the conditions for the farm's sustainability. The case study below is that of a farm that is converting to organic farming before considering agroecological practices¹⁵³ to improve its yields.

Organic farming plays a decisive role in preserving natural resources, the climate¹⁵⁴ and health. Its climate benefits are due in particular to a ban on the use of synthetic inputs in European specifications and limited rights to use pesticides and herbicides (which vary and are specified according to the crops). Other beneficial practices are implemented more frequently on average, such as longer and more diversified crop rotations and increased use of legumes. As a result, there are fewer pesticide residues in cultivated soils (– 30% to – 55%), and at lower levels; improved soil biodiversity indicators in 70% of cases thanks to the practices implemented; a reduction in GHG emissions of around 50% per unit area, and greater carbon accumulation in the soil than in conventional farming¹⁵⁵.

However, while this model offers significant guarantees in terms of environmental protection, it requires farmers to make efforts that are often insufficiently rewarded by the value chain.

152 See the scientific prospective study published by the EPRS (European Parliament Research Service) entitled: "Precision farming and the future of agriculture in Europe", [link](#)

153 In the field of agroecology, there are no such specifications, let alone any certification. In September 2024, the association Humanité et Biodiversité published "*TRAGECO: an observatory of the ecological transition in agriculture*", which partially fills this gap, [link](#)

154 It should be noted that organic farming can sometimes emit more GHG than conventional farming, particularly in livestock farming.

155 Dallaporta B., Gentil-Sergent C., Lacarce E., Cisowski, F., Vidal R., Sautereau N., 2024, Summary note | Quantification of the externalities of organic farming, 2024, ITAB, 4p, [link](#)

Farmers who commit to converting to organic farming first face a period of economic vulnerability during the two to three-year transition period between conventional farming and the moment when their products are certified under the AB label. Yields decline when synthetic fertilisers are banned, and vulnerability increases with restrictions on the use of plant protection products. This is particularly true for winter crops such as soft wheat, due to their longer growing cycle and increased sensitivity to bad weather and pests. However, during the first few years, farmers cannot sell their produce at organic prices and must accept a drop in income. In addition, the organic model involves an increase in labour costs, which can weigh on the farm's profitability in the early years.

This is why the conversion aid (CAB) offered under the CAP over a period of five years is intended to enable a rebalancing during this sensitive period, without which few farmers would be able to complete their conversion. This aid is allocated on the basis of the size of the farm, with the aim of compensating for additional costs and lost income, as with the MAEC. In the case illustrated, the farmer is allocated an annual amount of €350 per hectare (the amount offered for annual crops such as wheat¹⁵⁶), or nearly €17,000.

However, even after the transition period, AB-certified farmers may face difficulties due to prices that are insufficient to remunerate their production in line with the efforts made. In recent years, the price gap between organic and non-organic products has narrowed. For example, according to Interfel, the French fruit and vegetable trade association, the price difference between organic products and their conventional equivalents was around 30% in 2023, compared with 40% in 2019¹⁵⁷. This smaller difference is linked to the decline in demand for organic products observed in recent years, on the one hand, in a context of inflation, and on the other hand, with the emergence of other labels – for example, the HVE label¹⁵⁸.

The economic equation in the current system is therefore not conducive to encouraging farmers to convert, and may even push them to abandon the AB label. According to Agence Bio, the number of conversions fell by 32% year-on-year in 2022, while the number of deconversions rose by nearly 35%¹⁵⁹.

156 See the organic farming support sheet provided as part of the 2023-2027 CAP programming: [link](#)

157 "Fruit and vegetables: price differences between organic and non-organic products are narrowing", February 2024, [link](#)

158 Deemed misleading, this label has even been accused of unfair competition with organic farming and was taken to court by several associations in 2023: [link](#)

159 "Organic: conversions still outnumber deconversions, but for how long?", April 2023, [link](#)

Conversion to organic and agroecological farming – Case study of a wheat producer in transition

Case study of an individual farmer

– Established individual farmer, producing soft wheat using conventional methods and wishing to transition to organic production (47-hectare farm)

Conversion = obtaining AB certification

3 phases

- Contact one or more **certification bodies** and request a **quote**
- Notification to **Agence Bio**
- Send a **letter of commitment** to the chosen certification body (official start date of conversion)
- First **inspection visit** (in the event of non-compliance, the conversion start date is postponed to the date of compliance)

Duration 2-3 years

- Compliance **with organic specifications** during the transition period (2 years before sowing annual crops vs. 3 years before harvesting perennial crops), with production still being sold at **conventional prices**

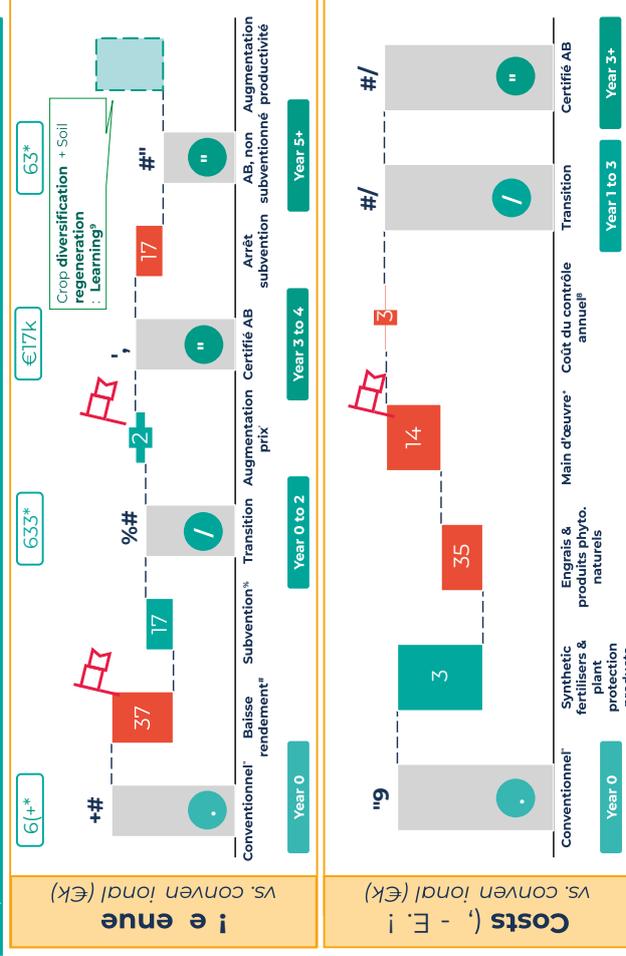
After conversion

- Adaptation of product **labels** in accordance with current regulations (i.e., use of the AB logo, certification body number)
- **Keeping a crop or livestock log** to record interventions carried out, products used and their origin, etc.
- **Two inspection visits per year** (including one unannounced visit) by the certifying body and **payment of the annual certification fee**
- **End of conversion assistance** 5 years after the start of conversion



Implementation of transition practices

Reduction in emission rates of 48% to 66% compared to conventional farming, mainly due to the absence of synthetic fertilisers. Drastic reduction in the use of plant protection products.



According to a joint study by INRAE and CIRED, with an iso-production model, a 50% reduction in the use of mineral nitrogen leads to a 12% to 34% reduction in agricultural production¹⁶⁰. Although these models do not take into account the potential increase in yield associated with the implementation of agroecological practices, reducing nitrogen use in order to meet European targets¹⁶¹ implies an ability to increase prices to compensate for lower yields.

The agricultural transition therefore calls for the necessary support for the consumption of organic products in each consumption segment. Current levels of subsidies, awareness-raising measures and enforcement of the regulatory framework do not create the conditions for the creation of an organic farming market¹⁶².

Creating supply – Beyond aid for conversion to organic farming, which is designed to compensate for additional costs and lost income, restoring maintenance aid would enable organic farmers to get through difficult periods such as the current one, when the premium price for organic products is limited. This would ensure long-term income, encouraging farmers to take the plunge and helping those who have already converted to avoid deconversion.

Creating demand – The **food transition** is a **necessary condition for the agricultural transition**. To achieve this, it is necessary to:

- Raise consumer awareness (**communication campaigns, food education** programmes incorporating an introduction to cooking, particularly in schools, and to types of crops and seasonal vegetables, for example)
- Establishing **quotas for organic products** on **supermarket** shelves, accounting for **50% of sales**.
- Enforce the **Egalim law**, which aims to "**create demand**" by imposing targets for organic products in **collective catering**, but which is currently **not being respected due to a lack of enforcement controls**.
- Encouraging restaurants to **increase** the proportion of **organic produce** they source **could be achieved** through the introduction of **tax credits**.

160 Anna Lungarska, Thierry Brunelle, Raja Chakir, Pierre-Alain Jayet, Rémi Prudhomme, et al. Halving mineral nitrogen use in European agriculture: insights from multi-scale land-use models. 2022. hal-03761774f, [link](#)

161 The "Farm to Fork" strategy proposed by the European Commission and adopted in 2021 envisaged a 50% reduction in pesticide use and 25% of agricultural land devoted to organic farming by 2030

162 Agence du Bio

IS THE TRANSITION TO ORGANIC FARMING A STEP TOWARDS OTHER AGROECOLOGICAL PRACTICES AND BETTER YIELDS?

If conversion to organic farming is accompanied by a sharp drop in yields, we can assume that, in parallel with compliance with organic farming specifications, the implementation of virtuous techniques over time (soil regeneration, agroecology, polyculture, etc.) and agronomic learning (whether acquired upstream or through trial and error) will ultimately lead to profits comparable to those generated by conventional farming.

This hypothesis is supported by a recent study highlighting Agreste-Insee data from 2020, which illustrated a positive trend in the sector before the organic sector experienced difficulties in 2021 due to a decline in consumption. The study showed that not only was the level of aid per structure equivalent in organic and conventional farming (subsidies accounting for 44% of EBITDA), but so was the level of economic profitability. When compared on a per-hectare or per-animal basis, the comparison of EBITDA was favourable to organic structures: differences of 40% per hectare and 75% per head¹⁶³.

However, this observation seems to apply more to certain sectors such as outdoor market gardening, viticulture, dairy cattle farming and egg-laying hen farming, which, according to the study, account for 42% of organic farms¹⁶⁴. The impact of subsidies on economic results is much lower in market gardening, horticulture and viticulture (less than 20% of EBITDA) than in cereal farming, for example (more than 70% of EBITDA).

163 "Organic farming: smaller and more economically efficient farms of a given size", February 2024, [link](#)

164 Transformations in agriculture and food consumption: 2024 edition / INSEE (France), [link](#)

Testimonial Julien Sallet, agroecological sheep farmer in Haute-Savoie

Julien Sallet has 150 dairy sheep on 45 hectares (mainly permanent grassland and a small mountain pasture) in an area where there is no local supply chain, so he quickly had to secure direct sales. He produces cheeses and dairy desserts, which he sells directly or through AMAPs (associations for the preservation of small-scale farming) or local retailers. He is also moving into school catering. Here, he talks about his transition from a conventional model to organic farming, and then going further into other agroecological practices and mixed farming to develop his climate and financial resilience. He now also has cereals, potatoes, fruit trees, 200 laying hens and a few pigs. He has 3.5 full-time equivalents on his farm (including himself, who does not count his hours).

FROM CONVENTIONAL TO ORGANIC...

"Fifteen years ago, I decided to start raising dairy sheep. I began with conventional farming, but very quickly I felt uncomfortable with the use of chemicals. That's how I turned to organic farming, not for economic reasons, but out of personal conviction.

When I started out, I was a ski instructor. At first, I didn't have enough training or knowledge. I made a lot of mistakes. But my income from skiing allowed me to get through the learning curve.

Although I started out as a conventional farmer, we are in areas and agricultural models that have evolved less, due to the mountains and PDOs, compared to other sectors that have been completely transformed. In the mountains, mechanisation was not possible. We still use a grassland system, an endemic system: grazing, mountain pastures, fodder, guaranteed by protected designations of origin. So it was less complicated for me to switch to organic farming than to a large-scale farming model.

...AND FROM ORGANIC FARMING TO OTHER AGROECOLOGICAL PRACTICES AND MIXED FARMING

However, switching to organic farming was only one step. My real challenge was to commit to agroecology, which aims to optimise agricultural production while integrating harmoniously into ecosystems. This requires a thorough understanding of ecological interactions. For example, in a

grazing system, I have to constantly make adjustments to ensure that my ewes' diet is balanced, depending on the plants that grow in my pasture each year. This is much more demanding than keeping animals indoors with a constant diet.

I am not talking about transition, because that would imply moving from one known model to another. However, the agroecological model is still under construction, which is why I prefer to talk about agriculture in motion. This requires each farmer to have a good knowledge of their land and the challenges it faces. Training, even if it takes a long time, is also essential. Unlike conventional farming, there is no pre-established recipe.

Beyond organic farming and in parallel with agroecology, I am trying to move towards more and more mixed farming. Today I raise sheep, but I am gradually reducing this to grow cereals. I have also started growing potatoes and producing flour for human consumption. I have started planting fruit trees for shade, but also for human consumption. This has led me to reintroduce a small pig farm to produce charcuterie and add value to my other products. A hundred years ago, this was the model for self-sufficient mixed farming. I want to return to this and try new things.

TRAINING: AN OBSTACLE COURSE

I'm really out of step with my colleagues. When it comes to training, there's no set path, it's all about improvisation. The Chamber of Agriculture can provide support, but the training courses I see address problems I had several years ago. I'm a pioneer. For example, this autumn I took a course on agroforestry, hedges and the benefits of forests for animals. But these courses are run by independent organisers, in this case my vet.

I learn from groups like the Shifters, through YouTube videos by other farmers, and by talking to my peers. However, it's often a solitary adventure. There are agroecology associations, such as CIVAM in Mayenne, but they are often local and compartmentalised. There is a lack of an overarching structure to bring these initiatives together on a large scale, which means that farmers have to bear the cost of training and experimentation alone."

FOR A SUCCESSFUL AGROECOLOGICAL TRANSITION: AGRONOMIC TRAINING AS THE CORNERSTONE

Agricultural training is essential for a successful transition to organic farming and agroecology. It enables farmers to acquire in-depth knowledge of ecosystems, plant life cycles and the sustainable practices needed to adapt to climate variability and reduce their dependence on chemical inputs. However, training programmes remain fragmented, often driven by local or individual initiatives, as Julien SAILLET (above) and Jonathan Chabert (below) testify. To scale up these transitions, it is crucial to structure and fund accessible training programmes that promote initial and ongoing skills development and support farmers in learning more sustainable and resilient models.

Testimonial from Jonathan Chabert, organic market gardener in the Côtes-d'Armor

Jonathan is an organic market gardener. He owns 3 hectares and employs 4 full-time equivalent staff (himself and 3 employees). His farming model is based on two pillars: 1) control of the entire value chain: he produces his own seeds and sells his produce directly at markets or through AMAPs (associations for the preservation of small-scale farming). 2) minimising dependence on machinery: he favours trained and skilled human labour and avoids the use of machines, robots or automatic systems, as he does not want to become dependent on them. He practises permaculture, diversifying his production and promoting interactions between plants. He grows more than 50 varieties of tomatoes and experiments with plant combinations on the same plot, seeking alternatives to phytosanitary products and ways to increase yields.

"For me, the organic market gardening model is profitable. There's no doubt about it. On 3 hectares of cultivated land, I support 4 people on a full-time equivalent basis, whereas some cereal farmers or livestock farmers in the area, who sometimes have more than 100 hectares of conventional land, can barely pay their own salaries. Alternative solutions do exist. For example, with beetroot, if we move away from monoculture, encourage crop rotation, avoid over-fertilisation and plant hedges, it is possible to produce without pesticides.

But transitions take time, and my model only works because I have acquired detailed knowledge of plants, their life cycles and their needs. I know how to adapt to climatic hazards and manage risks. As a farmer, you really have to know how to do everything to get by. This is true in conventional farming, and even more so in an agroecological model.

For organic market gardening to become widespread, three things are needed: passion, income and training. The vocation comes from sharing our methods with as many people as possible. On this farm, I've had more than fifty interns over the course of my career: they all came with the idea of doing meaningful work. But for these dreams to become reality, it has to pay, farmers have to be able to make a living from their work. An essential factor is training and support. Training must be provided during initial training but also on an ongoing basis once the farmer is established. You have to take the time to learn agroecology techniques, otherwise it doesn't work. Some chambers of agriculture and cooperatives do this, but it needs to be rolled out on a massive scale.

Training is the cornerstone of sustainable and profitable agriculture. I have noticed that many ecological farming projects fail due to a lack of adequate preparation. That is why I am calling for a rebalancing of subsidies in favour of people, i.e. employment and training rather than investment in machinery, which is not always a guarantee of success in the transition. "

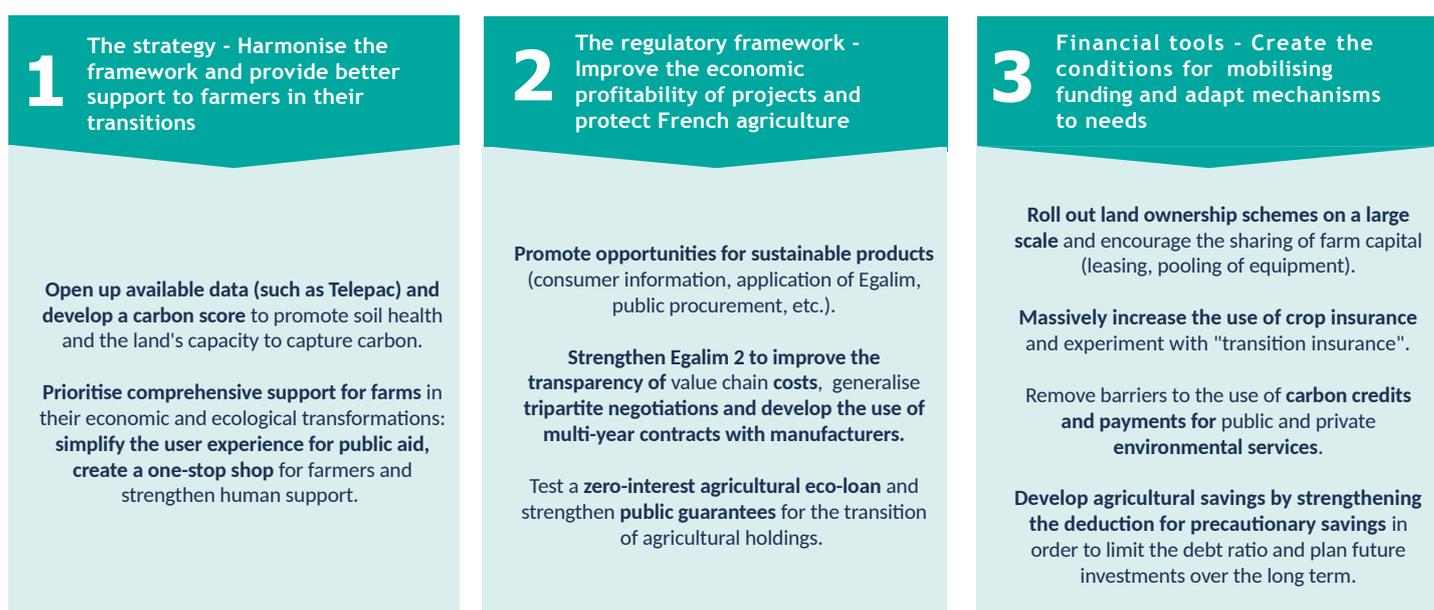
4 RECOMMENDATIONS FOR FINANCING STRONG, RESILIENT AND SUSTAINABLE AGRICULTURE

Public policy in the agricultural sector must aim to develop a strong French agricultural sector that ensures access to food and the country's food sovereignty based on a sustainable model that minimises its environmental footprint and adapts to climate change.

The recommendations presented in this section aim to create the conditions for the economic profitability of agricultural transition projects adapted to the situations of the greatest number of farms. They were developed following the two-pronged analysis presented in the report: the diagnosis based on numerous hearings conducted as part of this work (Part II) and the case study analysis (Part III). They were thus co-developed by a working group within the IFD in close collaboration with stakeholders in the agricultural sectors.

Figure – Summary of recommendations for financing strong, resilient and sustainable agriculture

source: Institut de la finance durable



A number of prerequisites are necessary for the organisation of the agricultural and industrial sectors in order to achieve the transition objectives. First, it is crucial to define a 30-year strategic vision for the agricultural sector, incorporating clear guidelines for strong, sovereign and environmentally friendly agriculture. Next, a course must be set for the agri-food industry, which supports the agricultural sector, to accelerate energy decarbonisation. Finally, it is essential to organise the coordination of sectors for collective work.

PREREQUISITE N° 1: Define a long-term strategic vision for French agriculture

Clear and ambitious 30-year agricultural planning is essential to guide French agriculture through its ecological transition. This vision must incorporate long-term objectives while meeting the requirements of competitiveness and food sovereignty. It must form the basis of strategic priorities to guide agricultural policies and mobilise all stakeholders. Together with all representatives of the agricultural sectors, the public authorities must draw up a roadmap for strong, sustainable, sovereign and resilient agriculture. Defending the French agricultural model based on family farming and high-quality agriculture is a priority today in order to preserve this economic asset for France in the world.

This need for agricultural planning also requires anticipating labour needs in agriculture. The agricultural transition calls for additional human capital: this means recruiting on a massive scale to meet the labour needs of agroecological sectors, but also training these sectors in new practices.

Establishing this strategic vision also means working to develop opportunities for the sectors of the future. It is therefore essential to generate demand for essential crops in crop rotation (legumes, flax, etc.). Finally, it is essential to develop outlets for non-food co-products of agriculture. **The development of non-food sectors is a strategic lever for diversifying agricultural outlets while financing the ecological transition.**

PREREQUISITE N° 2: Setting an industrial course for the sector's energy transition

A prerequisite for agricultural transition is that technological and industrial solutions be accessible to all farmers.

The first step is therefore to offer all farmers alternatives to fossil fuels and gas by developing an industry of transition solutions and the necessary infrastructure.

- Establish a roadmap with tractor manufacturers and distributors to massively expand the available range of alternative energy tractors (BioNGV, electricity, hydrogen, HVO, etc.) and biodiesel retrofits (B100).
- Promote innovation and research in the agricultural industry to develop new, more competitive carbon-free processes.

- Work with GRDF, Engie and interested energy companies to implement a plan to deploy compression stations on the gas network in order to develop CNG stations in rural areas throughout the country. In general, develop infrastructure to provide easy access to alternative energies.
- Amend certain current regulatory provisions that prevent the distribution of BioNGV by methanisation plants, firstly by providing for this possibility for limited volumes (<1GWh/year) through amendments to existing injection contracts and, secondly, by not applying the TICGN tax on these "100% renewable energy" volumes sold directly.

Secondly, wealth creation is necessary to finance part of the transition: energy production is one possibility. It is therefore necessary to enable all farmers who wish to do so to easily and quickly develop facilities for the production and self-consumption of renewable photovoltaic energy on their farms.

- The rules for the rapid development of low-power photovoltaic panel installations on farms should be relaxed to facilitate the production and self-consumption of solar energy.
- Reduce the time required for administrative authorisation of energy installations on farms.

PREREQUISITE N° 3: Promote coordination between sectors to create solutions for public and private financing and market opportunities

The agricultural transition requires large-scale action by all stakeholders involved. These are systemic changes that require the formation of coalitions of public and private stakeholders by sector in order to achieve a critical mass (farmers, cooperatives, manufacturers, distributors, financiers, researchers, government) that will enable projects to be set up to pool resources, financing and solutions.

One of the key players in this transition by sector is the cooperative. They are central to the work and planning of farm policy. Creating "transition committees" within cooperatives is one way of defining these collective policies and initiating the necessary investments.

THE STRATEGY – HARMONISE THE FRAMEWORK AND BETTER SUPPORT FARMERS IN THEIR TRANSITIONS

Harmonised assessment and valuation tools will make it possible to measure and promote environmental benefits. At the same time, it is essential to simplify public mechanisms through a one-stop shop and a harmonised regulatory framework, as well as to provide better support for farmers in their transformations. Finally, it is imperative to strengthen initial and continuing training in order to disseminate the skills necessary for this transition.

DEVELOPING TOOLS TO ASSESS THE AGRICULTURAL TRANSITION

PROPOSAL N° 1: Develop a methodological framework for accurately measuring the impact of different practices.

A great deal of research is being carried out on this subject¹⁶⁵. This research makes it possible to identify climate indicators for assessing the environmental quality of soils and products. The challenge today is to continue research and strive to harmonise frameworks in order to arrive at a common language:

- **On the supply side, with regard to soil health and its capacity to store CO₂, develop a harmonised eco-carbon score¹⁶⁶** (an Eco score, which is more comprehensive but certainly more complex to implement) in a given environmental and agronomic context;
- **On the demand side, an eco-score for food products is also a way of ensuring that sustainable products** can be promoted by value chains and consumers (Ademe is in the process of implementing "environmental labelling"¹⁶⁷).
- **On the financing and insurance side, open up available data (such as Telepac) on agricultural transitions in farms** to enable the creation of databases to develop a history of transitions. The data must be strictly anonymised and its use regulated. No personal data may be disclosed without the consent of the agricultural sector.

"As it has done for carbon and water," France "must propose a clear, integrated national framework based on shared definitions, adequate resources and ambitious objectives" for soils, according to the Land Transition Institute, which brings together several local authorities, in its "appeal" launched on Wednesday 5 February 2025¹⁶⁸.

165 INRAE, press release, "Preserving soil quality: towards a set of indicators", 20 November 2024, [link](#)

166 An amendment to this effect was tabled during the discussion of the LOAA but was not adopted.

167 <https://affichage-environnemental.ademe.fr/>

168 Call for a national soil policy, Institut de la Transition Foncière, 5 February 2025, [link](#)

SIMPLIFY THE FRAMEWORK AND BETTER SUPPORT THE TRANSITION

PROPOSAL N° 2: Simplify the user journey for accessing public aid and prioritise comprehensive support for farms in their economic and ecological transformations.

Numerous efforts have already been made by the Ministry of Agriculture and Food Sovereignty in this direction: coordinated management of support policies through the implementation of ecological planning at the MASA, single control, single point of contact for hedges, etc. These efforts deserve to be reinforced:

- Simplify existing public support mechanisms to improve the clarity, consistency and effectiveness of public spending. While it is normal to adapt support mechanisms to specific regional characteristics, it is necessary to strengthen and perpetuate the overall management, particularly through ecological planning, of the effectiveness of public support for agricultural transition, avoiding silo mentality and multiple interventions by public services.
- Promote a one-stop shop approach for comprehensive support for farmers wishing to carry out their ecological transformation and access public subsidies, as already exists today for hedges. Chambers of agriculture, which already play this advisory role for farmers, could see their resources strengthened for this purpose.
- Enable a simple simulation of agricultural transition with access to an advisor providing information and easy access to all available schemes. This also involves limiting the administrative burden on farmers.
- Strengthen human support for farmers' transitions, whether through chambers of agriculture, cooperatives or industry associations. Investing in human capital is key to the successful transition of the majority of farms in the coming years.

STRENGTHEN TRAINING AND COLLECTIVE SKILLS DEVELOPMENT FOR THOSE INVOLVED IN THE TRANSITION

PROPOSAL N° 3: Consolidate the initial training courses available and support the continuing education of farmers to keep them up to date with developments in sustainable agricultural practices.

Collective innovation, networking, sharing best practices, pooling data and experiments are already at the heart of many agricultural organisations (chambers of agriculture, cooperatives, professional federations, etc.). The aim is to strengthen this movement with solid initial and continuing training in agricultural transition for all farmers who wish to participate, and to support agricultural sectors so that they can provide the tools for this collective skills development, particularly in the context of the necessary adaptation of practices to climate change (measure 36 of the PNACC, actions 3 to 7).

THE REGULATORY FRAMEWORK – IMPROVING THE ECONOMIC PROFITABILITY OF TRANSITION PROJECTS AND PROTECTING FRENCH AGRICULTURE

To ensure a sustainable agricultural transition, it is imperative to strengthen the profitability of projects while reducing the economic risks borne by farmers, who currently have little financial leeway. Above all, conditions must be created to ensure that the market rewards farmers fairly for their work by working on consumer demand to support sustainable agriculture, as well as distributing the cost of the transition across the entire value chain. These measures, coupled with better protection against distortions of competition, would secure the future of the sector on a sound footing. This also requires better targeting of public aid, lower financing costs and support for risk-taking in transition investments.

STIMULATING DEMAND FOR SUSTAINABLE AND LOCAL PRODUCTS

PROPOSAL N° 4: Promote the creation of outlets for organic and sustainable agricultural products.

- Improve consumer information on the origin of products to promote the quality and sustainability of French products in order to support changes in consumption and consumer appreciation of products from sustainable agricultural practices in France.
- Enforce the Egalim law, which requires 50% of products in public and private catering to be sustainable or officially certified (including 20% organic) from 1 January 2024, with penalties for non-compliance.
- Activate the lever of long-term public procurement with an environmental dimension to encourage the purchase of organic and sustainable products by the State, its services and local authorities.
- Encourage catering professionals to increase the proportion of organic or sustainable products in their supply chain by introducing a tax credit for those sourcing more than 20% of their products from organic suppliers.
- Apply quotas to large retailers to ensure representation and outlets for sustainable products.

In 2025, Ademe is trialling a "green card" in Angers, which rewards purchases of organic and sustainable products with a discount. Each time participants visit certain outlets that offer an average of 90% organic or equivalent products (organic markets, farmers' shops), they will receive an immediate 20% discount on the cost of their shopping basket. If the trial is successful in Angers, ADEME hopes to extend it to larger areas. The challenge will also be to sustain the service through other sources of funding.

SPREADING THE COST OF THE TRANSITION ACROSS THE ENTIRE VALUE CHAIN

PROPOSAL N° 5: Strengthen Egalim 2 to improve cost transparency across all links in the value chain (farmers, manufacturers, distributors).

Egalim 2 requires that the price paid to farmers be protected in negotiations and mandates price transparency throughout the value chain. However, there are still many exceptions to this principle. To ensure its effectiveness, regulatory measures can reinforce the principle and controls must be more regular, anomalies must be immediately followed up by an investigation by the DGCCRF (French Directorate-General for Competition, Consumer Affairs and Fraud Control) and, in the event of fraud, sanctions must be applied.

PROPOSAL N° 5 BIS: Develop the use of long-term contracts between manufacturers and farmers and strengthen the consideration of production costs and transition costs in contracts to better take into account agricultural production cost indicators¹⁶⁹. More specifically, strive to generalise the implementation of tripartite negotiations allowing all links in the value chain (farmers, manufacturers, distributors) to take into account changes in the cost price of agricultural raw materials.

This measure could promote the integration of Scope 3 into the decarbonisation strategy of companies downstream in the food chain. Today, Scope 3 emissions from agri-food companies can account for the vast majority of a company's total emissions. An increased incentive to reduce Scope 3 emissions could be a lever for financing the downstream value chain and ensuring a better distribution of the cost of decarbonisation.

PROTECTING FARMERS FROM DISTORTIONS OF COMPETITION

To protect farmers from distortions of competition, there needs to be consistency between international trade rules and environmental standards.

PROPOSAL N° 6: Avoid distortions of competition and ensure consistency between environmental and trade policies.

The European Union's free trade agreements include a standard chapter on Trade and Sustainable Development and, where possible, a chapter on Sustainable Food Systems.

¹⁶⁹ This is already provided for by law, alongside other indicators such as market prices, but without sufficient detail. In particular, the weighting to be given to these indicators could be clarified.

France strongly supports this ambition, but more needs to be done to protect French agriculture in its pursuit of food sovereignty and ecological goals:

- Improve the WTO's agricultural safeguard clauses to ensure food sovereignty;
- Extend the carbon border tax to agricultural products;
- Implementing genuine sustainable development measures in free trade agreements to ban imports of products whose production conditions are less sustainable than in France.

RETHINK PUBLIC AID TO ACCELERATE THE AGRICULTURAL TRANSITION

PROPOSAL N° 7: Redirect part of the available public aid (common agricultural policy, national aid, etc.) towards incentive financing for agricultural transition.

- Transform the tax exemption on agricultural diesel into agricultural savings that will be earmarked for purchases and investments related to the decarbonisation of the farm's energy consumption (energy renovation, conversion to low-carbon agricultural machinery, energy production, etc.).

Without reducing subsidies for agricultural diesel, this would allow the savings made to be redistributed towards the purchase of equipment that contributes to the low-carbon transition. A list of equipment would be defined by the public authorities in close consultation with the sectors concerned. This redistribution alone will not be enough to finance all the investments; a more comprehensive reorientation of public aid is necessary.

- Massively increase access across the country and remove the ceilings on agri-environmental and climate measures (AECM).
- Limit aid in the form of time-limited calls for tenders, which undermine the visibility and predictability of transitions.
- Reassess aid for maintaining organic farmers. This would ensure long-term income to encourage farmers to take the plunge and those who have already converted to avoid deconversion.
- Take into account compensation for stranded assets in the event of conversion, i.e. losses related to the reconfiguration of their farms.
- Make widespread use of payments for public environmental services to compensate farmers for soil regeneration, non-degradation and maintenance of natural spaces and resources.
- Include farmers participating in research and experimentation programmes in the agricultural transition within the framework of the Research Tax Credit.

Remuneration of farmers for the conservation of natural resources: the case of Switzerland

Article 104 of the Swiss Federal Constitution provides for the direct remuneration of farmers for "services of general interest" including "security of supply, conservation of natural resources, maintenance of the rural landscape and decentralised land use"¹⁷⁰.

Art. 104 Agriculture

1. The Confederation shall ensure that agriculture, through production that meets both the requirements of sustainable development and those of the market, contributes substantially to:

- a. to the security of supply for the population;
- b. the conservation of natural resources and the maintenance of the rural landscape;
- c. decentralised land use.

2. In addition to the mutual assistance measures that can reasonably be expected of agriculture and, where necessary, by derogating from the principle of economic freedom, the Confederation shall encourage small-scale farming.

3. It shall design measures to ensure that agriculture fulfils its multiple functions. Its powers and duties shall include the following:

- a. supplementing farmers' income through direct payments to ensure fair remuneration for the services provided, provided that the farmer can demonstrate that he or she meets ecological requirements;
- b. it encourages, by means of economically attractive incentives, forms of farming that are particularly in harmony with nature and respectful of the environment and animals;
- c. it legislates on the declaration of the origin, quality, production methods and processing of foodstuffs;
- d. it protects the environment against damage caused by the misuse of fertilisers, chemicals and other auxiliary materials;
- e. it may encourage agricultural research, extension and training and grant investment aid;
- f. it may legislate on the consolidation of rural land ownership.

4. To this end, it commits special-purpose agricultural credits and general resources of the Confederation.

¹⁷⁰ See the Constitution of the Swiss Confederation, [here](#)

MOBILISING BANKING TOOLS TO SUPPORT AGRICULTURAL TRANSITION

PROPOSAL N° 8: Explore the possibility of a zero-interest eco-loan (éco-PTZ) for transition investments by farmers.

This scheme would make it possible to generalise the offer of subsidised loans for farmers' transition investments and reduce the cost of financing the transition, thereby increasing the profitability of transition projects for farmers. Finally, it would reduce farmers' debt ratios. The relevance of the scheme should be analysed in terms of cost-benefit compared to other schemes. The list of eligible investments will need to be specified and targeted in order to limit the financial cost.

PROPOSAL N° 8 BIS: Extend the use of *Sustainability Linked Loans* to all levels of the agri-food value chain, including processing links, to encourage them to support their suppliers in their transition.

MOBILISE PUBLIC GUARANTEES TO SUPPORT FARMERS IN TAKING RISKS

PROPOSAL N° 9: Strengthen public guarantees for investments related to the transition of agricultural holdings.

Transition Bonds, a public guarantee system for transition investments, were launched by the Ministry of Economy and Finance in autumn 2024. While they currently provide guarantees for a certain number of pieces of equipment in the sector¹⁷¹, the tool needs to be expanded to make it more suited to the diversity of agricultural transitions. For investments related to agricultural transition, the aim is to enable a greater number of businesses to benefit from the financing tools available by guaranteeing the lender repayment (e.g. up to 80%) of the loan, even in the event of default by the farmers. This would reduce the cost of financing.

¹⁷¹ The decree of 19 November 2024 includes agricultural equipment in Annex I, which lists eligible equipment ([Decree of 19 November 2024 on the State guarantee provided for in Article 185 of Law No. 2023-1322 of 29 December 2023 on finance for 2024 – Légifrance](#)). However, for the "business solution" component " component (Article 5 of the Decree), companies in the primary agricultural production sector are excluded from the scope (see Decree No. 2024-752 of 7 July 2024, <https://www.legifrance.gouv.fr/loda/id/JORF-TEXT000049894711/2025-02-25/>).

Furthermore, measure 24 of the Pacte d'orientation pour le renouvellement des générations en agriculture (Pact for the renewal of generations in agriculture) dating from the end of 2023 provided that "the State will launch a new financial instrument enabling the deployment of loan offers that will benefit from a State guarantee, in order to provide massive support for new agricultural installations and transitions. This financial instrument [...] will notably take over from the National Initiative for French Agriculture (INAF), which enabled €1 billion in guaranteed loans to be deployed between 2020 and 2023. [...] The financial instrument will also be intended for existing farmers who wish to finance transformative investments that, by their nature, carry greater risk." The success of INAF, a financial instrument developed with and implemented by the European Investment Fund (EIF) (€1.1 billion in loans covered by a national budget allocation of €54 million in less than four years), both from the point of view of financial intermediaries and the operator and final beneficiaries, is decisive in the shared desire to renew such an initiative.

It should be noted that agricultural businesses can benefit from certain public guarantee schemes through Bpifrance. The guarantees offered by Bpifrance have been available to agricultural and forestry businesses since 17 June 2024. Farmers can apply for loans from their banking partners, who can then benefit from the Bpifrance guarantee to cover part of the risk associated with these loans. The guarantees offered by Bpifrance cover up to 70% of the loan amount, depending on the offer chosen. This guarantee enables farmers to access the financing they need for their projects, including those related to the ecological transition. Bpifrance is working with MASA to create a dedicated agricultural guarantee scheme in addition to its guarantee schemes open to all. It is expected to be launched in the first quarter of 2025. These developments should be closely monitored.

MODERNISING INDUSTRY AND EQUIPMENT FOR COMPETITIVE AND SUSTAINABLE AGRICULTURE

PROPOSAL N° 10: Accelerate the amortisation of industrial investments dedicated to agricultural transition: promote R&D in agricultural practices and finance the transition of the agricultural equipment and agri-food industries.

In general, the modernisation of the equipment and agri-food industry should be encouraged for competitive and sustainable agriculture:

- Lower the threshold for access to public funding and simplify formal requirements to limit project engineering costs for smaller businesses.
- Strengthen support for agri-food R&D.
- For the agri-food industries, perpetuate and extend the productive over-depreciation measure.
- Speed up administrative procedures for the installation of new industrial capacity.

A 2021 report by FranceAgrimer¹⁷², acknowledged a loss of competitiveness "outside of pricing" linked to a decline in R&D investment by French agri-food companies. This decline appears to be linked to a reduction in the investment capacity of companies, whose margins are being squeezed. In the long term, this leads to a cycle of disinvestment and loss of performance. However, agri-food companies already have access to research tax credits to support their R&D. In addition, the agri-food industries have recently gained access to France 2030 funding for sustainable food¹⁷³.

¹⁷² [FranceAgrimer report](#)

¹⁷³ [France 2030, presentation of objective 6: investing in healthy, sustainable and traceable food | Ministry of Agriculture and Food Sovereignty](#)

FINANCIAL TOOLS – CREATING THE CONDITIONS FOR MOBILISING FUNDING AND ADAPTING FINANCIAL SUPPORT TO FARMERS' NEEDS

Finally, to accelerate the agricultural transition, a variety of financial mechanisms must be made available to farms so that each can find the ones best suited to its needs. These mechanisms must take into account the fact that, in many cases, the agricultural transition does not require significant initial investments, but rather changes in practices that impact operating expenses over a transition period of several years before they produce the desired effects. This means taking into account cash flow constraints, the risks associated with the transition and the time horizon of farmers. It is crucial to mobilise funding at all stages, provide support during periods of transition and coordinate the efforts of public and private actors.

REDUCING DEBT AND DEPLOYING RISK MANAGEMENT MECHANISMS

PROPOSAL N° 11: Massively develop land ownership schemes where private investors temporarily take ownership of land to reduce farmers' costs and allow them to free up financial margins so they can focus on the transition during the set-up period.

Beyond the significant constraints that currently exist on access to land, the financing of agricultural land can be a major obstacle to the establishment of farmers, but it can also be a potential source of financing for the transition if this initial investment is deferred. Agricultural land holding facilitates the establishment of new farmers and can encourage agricultural transition.

The model used by certain land holding companies, such as Printemps des terres, Terre de Liens and Foncière Occitanie, is particularly interesting because it reconciles the need to reduce the debt of farmers who wish to transition to setting up their own farms with the French model of the farmer as owner of his land (thanks to the purchase option, which he receives a guarantee for after five years of farming the land).

To encourage the widespread adoption of land ownership, a major initiative could be launched to create a land ownership fund, financed by private funds and guaranteed by public funds such as Bpifrance.

In general, the aim is to support the carrying of capital for agricultural holdings with tools such as *leasing*, third-party financing (particularly for large installations such as photovoltaic systems) and the pooling of agricultural equipment.

PROPOSAL N° 12: Continue to increase the use of crop insurance and adapt the system to make it an incentive for changes in practice. Develop experiments for the implementation of "transition insurance" to guarantee the risk taken by farmers in their transitions.

- **Create a national solidarity fund** for insurers to finance a bonus in crop insurance in the event that farmers take risks by changing practices that increase volatility.
- Using public and private funding, **finance a research programme** involving a pool of insurers working with laboratories to establish a common methodology and shared databases to improve visibility of transitions and adapt rates to changes in practice.
- **Test the implementation of insurance against transition risks** in the form of compliance with a set of specifications for new practices by farmers, based on the model of foreign prospecting insurance available to SMEs seeking international opportunities. Additional work and databases need to be consolidated before this type of scheme can be rolled out on a large scale.

Such a "transition" insurance contract would require in-depth work through market discussions to define its characteristics (risks covered, type of crops, risk sharing between farmers/insurers/the State), specifying the definition of "transition" used and how it fits in with the current crop insurance scheme.

CONTINUE TO DEVELOP INNOVATIVE PUBLIC-PRIVATE FINANCING SOLUTIONS THAT SUPPORT FARMS DURING PERIODS OF TRANSITION

PROPOSAL N° 13: Remove barriers to encourage the use of carbon credits and public and private payments for environmental services (PES) that reward farmers for achieving environmental objectives.

- Recognise the low-carbon label at European level with the new Carbon Removals and Carbon Farming (CRCF) Regulation (EU/2024/3012) published in the EU Official Journal on 6 December 2024, in particular to develop its international visibility. The aim is to bring the low-carbon label into line with the European framework.
- In order to ensure fair remuneration for the projects underlying carbon credits, it seems appropriate to continue efforts to improve project quality, as carbon credits deemed to be of high quality by buyers generally command higher prices on the market. Quality indicators should be identified to enable price differentiation.
- Strengthen mandatory carbon offset systems to support demand for quality (domestic flights and coal-fired power plants in particular in France today). The international CORSIA scheme is currently being put in place to also require carbon offsetting for international flights.

- Similar issues arise for biodiversity credits today, which do not benefit from any labelling system. Work should be continued to study the feasibility of a harmonised framework for biodiversity credits, as this issue is particularly critical in the agricultural sector, and therefore the benefits to be promoted are all the more significant. Conditions should also be created for the emergence of a market for biodiversity credits and certificates.
- Roll out the PSE experiments developed by the MTE and water agencies, which currently cover 1% of the UAA in mainland France¹⁷⁴.
- Encourage the development of PES involving coalitions of private actors, particularly within value chains, which allows a direct link between downstream actors and upstream farms.

PROMOTE THE ECOLOGICAL HERITAGE OF FARMERS AND ENCOURAGE RESILIENCE

PROPOSAL N° 14: Develop agricultural savings by increasing the deduction for precautionary savings.

The aim is to encourage farmers to allocate part of their profits to building up cash reserves in order to manage uncertainties and plan for necessary future investments. This helps to combat over-equipment by focusing investment on tools that are necessary and suited to the needs of the transition in particular, while also helping to reduce farmers' debt.

This proposal can be implemented by strengthening the DEP (precautionary savings deduction) scheme. The DEP (which has a double cap on the amount saved each year and on the total amount) is currently not subject to any specific conditions of use, but the amounts deducted must be used within the following ten years for expenses required for professional activity¹⁷⁵. The proposal here is to increase the caps and to earmark it, as a priority, for any type of productive investment on the farm.

At the same time, the tax deductibility of depreciation for equipment related to the ecological transition should be maintained and adapted in order to encourage strategic investments.

PROPOSAL N° 15: Promote soil regeneration (and non-degradation) in the price per hectare and the risk and financing model for farms.

This valuation can be based on the development of the eco/carbon score. As prices per hectare are heavily regulated by SAFER, it is proposed that SAFER incorporate a soil health indicator into their pricing model.

¹⁷⁴ See the assessment on the ministry's [website](#)

¹⁷⁵ See the Cerfrance [website](#) for more details.

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Guillaume Bone

LIST OF HEARINGS

AGRICULTURAL SECTOR

Farmers

Adeline Yon-Berthelot, Cattle farmer, Regional Councillor for Brittany

Valentin Lemierre, farmer and biogas producer

Jonathan Chabert, organic market gardener

Julien Sailliet, Dairy sheep farmer

Samuel Dugas, dairy cattle farmer

Martine and Jacques Bouffartigue, market gardeners

Laurent de Lacoste, co-manager of a cereal farm

Axema

Laurent de Buyer

Bioline (subsidiary of InVivo)

Laurent Martel

Diane Sergent

CFDT Agri-Agro

Alexandre Dubois

Chambers of Agriculture

Sébastien Windsor, President of the French Chambers of Agriculture Network, President of the Normandy Regional Chamber of Agriculture

Luc Servant, Vice-President of the French Chambers of Agriculture network, President of the Charente-Maritime Chamber of Agriculture

Hélène Aussignac

Agricultural Cooperation

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Agathe Duval

Carole Le Jeune

Confédération Paysanne

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Samuel Dugas, Spokesperson for Ille-et-Vilaine

National Federation of Farmers' Unions (FNSEA)

Arnaud Rousseau, President

Olivier Dauger, Climate and Energy Advisor

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Christian Couturier

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Alexandre Godin

Hénaff SA

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Nature4Growth

Dylan Thuillier

Printemps des Terres

Laurent Piermont

Sylvain Goupille

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Bank of Territories

Gil Vauquelin

BNP Paribas

Lucia Perez Sierra

Sarah Colombie

Carbioz

Dominique

Moreau-Ferrellec

Crédit Agricole

Jean-Christophe

Roubin

Eric Campos

Sophie Caron-Jourdain

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ACKNOWLEDGEMENTS



This work was carried out by the Institute for Sustainable Finance as part of the work of the Ecological Transition Financing Committee (CFTE) in response to a request from Bruno Le Maire, Minister of Economy and Finance.

This document was produced as part of the IFD's multi-stakeholder working group on financing the agricultural transition within the "Financing Solutions for the Ecological Transition" project, led by Yves Perrier, President of the IFD, and coordinated by Vincent Burnand-Galpin, Head of Financing for the Ecological Transition, with the support of Nicolas Lancesseur, Director of Climate and Environment, and Cécile Goubet, IFD Managing Director. This work was carried out with the sponsorship and advice of Julien Denormandie, former Minister of Agriculture and member of the IFD Board of Directors.

The Institut de la Finance Durable would like to thank all the members of the working group for their involvement in this work, in particular Julien Denormandie (former Minister, Sweep), Adeline Yon-Berthelot (Brittany Region), Dylan Thuillier (Nature4Growth), Vanessa Laubin (Ademe), Eric Campos, Jean-Christophe Roubin and Caroline Crépin (Crédit Agricole), Lucile Rogissart, Samuel Féret and Olia Tayeb-Cherif (I4CE), Sarah Colombie (BNP Paribas), Sylvain Goupille and Laurent Piermont (Printemps des Terres), Marguerite Culot (Caisse des Dépôts), Antoine Giry (Ministry of Ecological Transition – CGDD), Félix Bastit, Etienne Pasteau, Adrienne Moreau (Ministry of Economy and Finance), Leonard Didelet, Vanessa Delavasaux and Jean-Baptiste Turmel (Ministry of Agriculture and Food Sovereignty).

The Sustainable Finance Institute would like to thank the experts and stakeholders from the agricultural sector who contributed to this work, in particular Christian de Perthuis, Clémence Vorreux (The Shift Project), Loïc Hénaff (Hénaff SA), Philippe Delacote (INRAE), Arnaud Rousseau, Olivier Dauger, Antoine Suau and Darrell Leroux (FNSEA), Jonathan Chabert and Samuel Dugas (Confédération Paysanne), Christian Couturier (Solagro), Laurent de Buyer (AXEMA), Bertrand Convers (La Cooperl), and Sébastien Windsor, Hélène Aussignac, and Jérémy Dreyfus (Chambres d'Agriculture), Yoann Méry and Carole Le Jeune (Coopération Agricole). Finally, we would like to thank the farmers who took the time to share their views, in particular Jonathan Chabert, Julien SAILLET, Adeline Yon-Berthelot, Valentin Lemierre, Samuel Dugas, Martine and Jacques Bouffartigue.

The Sustainable Finance Institute would also like to thank the teams at the Kearney consulting firm for their support in conducting the interviews, compiling the documentation and drafting the report, in particular Alicia Benmeziani, Marine Borysewicz and Nicolas Lioliakis.

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