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Bioeconomy case study

Initiatives for climate transition in the French dairy and beef sectors⁽¹⁾

Introduction - Context

The French National Low Carbon Strategy (NLCS)⁽²⁾, first adopted in 2015 and revised in 2020, sets out the roadmap towards reaching national carbon neutrality by 2050. The Strategy foresees a 46 % reduction in greenhouse gas (GHG) emissions from the agricultural sector compared to 2015. Achieving this goal implies, above all, reducing the non-energy related emissions of nitrous oxide mainly linked to the use of nitrogen fertilisers and methane from livestock effluents. In addition, agricultural soils are to be turned into a net carbon sink through soil-enhancing land management practices.

The Strategy also foresees halving the energy-related GHG emissions of the agriculture sector by increasing the use of renewable energy in agricultural activities. The sector is also expected to increase its provision of renewable energy for other sectors.

French agricultural organisations are translating the national strategy into sectoral approaches and initiatives. The livestock sector, which according to the NLCS is responsible for 45 % of France's methane emissions, has developed methods to assess the GHG emissions of cattle production and ways to decrease them. This briefing presents some of the related climate initiatives and an example of their application in the French region of Pays de la Loire.

Farm carbon footprint at the heart of the low carbon transition

Awareness of the climate impacts of different farm management practices and how farmers can play an active role in reducing GHG emissions is increasing rapidly. Whole farm carbon footprint assessments, facilitated by specialised farm advisers, help build awareness and support farmers' decisions to change their practices. In France, these assessments are being standardised using a specific tool. The CAP'2ER⁽³⁾ is an environmental footprint calculator for ruminant livestock farms, developed by the French Livestock Institute (IDELE)⁽⁴⁾ in the context of the LIFE Carbon Dairy⁽⁵⁾ and LIFE Beef Carbon⁽⁶⁾ projects.

(1) ENRD, with support from Jean-Baptiste Dollé, Livestock institute IDELE; and Angèle Liaigre, office of Pays de la Loire region in Brussels

(2) <https://www.ecologique-solidaire.gouv.fr/strategie-nationale-bas-carbone-snbc>

(3) <http://www.cap2er.fr/Cap2er/>

(4) <http://idele.fr/>

(5) <http://carbon-dairy.fr/>

(6) https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5355



CAP'2ER is based on the GHG sources methodology established by the Intergovernmental Panel on Climate Change (IPCC)⁽⁷⁾ and is certified by ECOCERT⁽⁸⁾. It calculates a farm's carbon footprint as the total balance of its GHG emissions and carbon removals - i.e. the emission intensity of the different farm activities and the farm's carbon sequestration measures. It also calculates other environmental indicators according to the farm's management practices, such as nutrient leakage, ammonia emissions or impacts on biodiversity.

The farm's carbon diagnosis also allows to assess the economic, environmental and climate impacts that would result from different changes in farm management practices. CAP'2ER recognises over 40 mitigation practices that either reduce GHG emissions or increase the soil's carbon sequestration. Based on the opportunities identified, the farmer, accompanied by an accredited adviser, sets out an action plan to reduce the farm's carbon footprint over time. The plan consists of mitigation practices that the farmer considers as the most feasible and effective in terms of expected climate and economic outcomes.

Table 1: Areas of possible mitigation practices for livestock farms recognised by CAP'2ER:

Reducing GHG emissions		Increasing carbon sequestration
Inputs Pasture management Concentrates and fertilisers Legumes, crops rotation	Herd management Increasing productivity Reducing number of unproductive animals	Cover crops Avoid bare soil Agroforestry Planting hedges Grassland management
Fuel and electricity No-till cultivation Power and equipment Working organisation	Feed Feed efficiency Forage quality and yield	
Crops management & fertilisation Legume fodder crops Optimisation of fertilisers uses	Manure management Time spent in shed vs pasture, Biogas production	

"One important lesson we have learned from this carbon initiative is that we are able to speak to the public in simple terms about what we do on our farms to protect the environment. This tool allows us to use very simple words that everyone can understand: to be able to save carbon you need to use less fuel, less electricity, have better performing animals." – Romain Leblanc, farmer participating in the Low Carbon Dairy Farm initiative, Pays de la Loire

National initiatives for upscaling mitigation

The farm-level carbon diagnosis using CAP'2ER is the cornerstone of the climate initiatives of the French dairy and beef value chains. In the dairy and beef sectors, the 'Low Carbon Dairy Farm'⁽⁹⁾ and the LIFE Beef Carbon⁽¹⁰⁾ initiatives are piloted by the National Interprofessional Dairy Economy Centre (CNIEL)⁽¹¹⁾ and by the National Interprofessional Beef Economy Centre (INTERBEV)⁽¹²⁾ respectively. They bring milk and beef producers, processors, cooperatives and advisory organisations together around the shared objective of cutting the French cattle sector's GHG emissions by 15 to 20% by 2025 compared to 2015. Over 9.300 dairy farms and 4.000 beef farms have adopted mitigation measures as part of the initiatives⁽¹³⁾. The objective is to cover 50% of French cattle farms by 2025. The initiatives offer consulting support to farmers to calculate their carbon balance, set up an action plan, train advisers, and support on-farm investment.

As for certifying the emission reductions achieved by livestock farms, the French Livestock Institute (IDELE), CNIEL, INTERBEV, the National Livestock Confederation and the think-tank I4CE⁽¹⁴⁾ developed a methodology called CARBON AGRI⁽¹⁵⁾. It monitors and calculates a farm's *carbon efficiency* (kg CO₂/kg of production) using CAP'2ER. The methodology enables the accounting of the actual emission reductions resulting from the implementation of each farm's individual mitigation plans.

(7) <https://www.ipcc.ch/>

(8) <https://www.ecocert.com/en>

(9) <http://www.ferme-laitiere-bas-carbone.fr/decouvrir-le-projet>

(10) <http://idele.fr/reseaux-et-partenariats/life-beef-carbon.html>

(11) <http://www.filiere-laitiere.fr/en/les-organisations/cniel>

(12) <https://www.interbev.fr/>

(13) 2019 situation; source <http://www.ferme-laitiere-bas-carbone.fr/decouvrir-le-projet>

(14) <https://www.i4ce.org/home/>

(15) <https://france-carbon-agri.fr/methodologie-carbon-agri/>



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A national Low Carbon Label (Label Bas Carbone)⁽¹⁶⁾ was established in 2018 to encourage voluntary carbon offsetting payments to rural climate change mitigation measures implemented by farmers and local authorities. The label recognises various mitigation practices including those carried out by the dairy and beef sectors using the CARBON AGRI methodology. Farms obtaining the label can finance parts of their carbon action plans with payments from people or organisations who buy carbon offsetting credits. Cattle farmers have founded an association, France Carbon Agri⁽¹⁷⁾, to assist farms in obtaining this funding.

Drivers of change

One of the incentives for farmers to adopt carbon action plans is that many mitigation practices have a positive impact on the farm's cost efficiency. Efficient farms tend to have a smaller carbon footprint, regardless of their size or production system. With carbon offsetting projects in agriculture increasing, the Low Carbon Label may provide a new economic incentive for farmers to take mitigating measures.

Upscaling the climate change mitigation activities to all farmers is an opportunity to develop local circular economies based on locally-produced animal feed, manure valorisation, biogas production and innovative local solutions tested by different value chain actors.

The dissemination and application of mitigation techniques at national and regional levels require a broad range of expertise in herd and crop management. Multi-actor partnerships are key in this process. Thanks to the involvement of stakeholders like producer associations, dairy and meat companies, cooperatives, regional and rural entities and advisory organisations, today French farmers are well informed about the low carbon initiatives. Interested farmers can access related training sessions and technical advice, carry out carbon diagnoses, and establish carbon action plans.

Financing the upscaling

Advisory services are essential to roll out the Low Carbon Dairy Farm and Beef Carbon schemes at national level but they come at a cost. To date, on-farm carbon assessments using CAP'2ER and the establishment and implementation of farms' carbon action plans are financed in different ways, including the two LIFE projects mentioned above. Financial support also comes from private companies from the dairy and beef sectors and regional public authorities, who aim at carbon neutral territories and want to promote rural economic activity. Part of the advisory services can also be funded by farmers themselves, possibly with carbon offsetting income through the Low Carbon Label. In many French regions, a combination of these funding opportunities ensures the upscaling of the low carbon initiatives to more and more farms.

The Rural Development Programmes (RDPs) co-funded by the EAFRD can play an important role in disseminating low carbon plans to farms and to increase related knowledge and skills. An example of the synergy between the Low Carbon Dairy Farm initiative and the regional RDP of the Pays de la Loire region is presented below. Other examples include for instance the Nouvelle Aquitaine region, where the EAFRD is used to co-fund the Beef Carbon Nouvelle-Aquitaine project⁽¹⁸⁾ that adapts the national low-carbon tools and initiatives to the local context so authorities and stakeholders can establish a regional low carbon action plan. The project targets new farmers and is building an innovative farm observatory and developing a carbon offset mechanism at regional level.

The farm level investment support and Agri-Environment-Climate measure offered by the RDPs can be applied for implementing certain mitigation actions, such as upgrading farm equipment for more energy efficiency, improving manure handling, or establishing and maintaining permanent grasslands.

(16) <https://www.ecologique-solidaire.gouv.fr/label-bas-carbone>

(17) <https://france-carbon-agri.fr/>

(18) http://www.interbev-nouvelleaquitaine.fr/medias/AQUI/documents/19_05_27_idele_presentation_beef_carbone_na.pdf

Monitoring and data gathering

As data collection for both the initial carbon audits and monitoring the effects of the farms' low carbon action plans are time consuming, several solutions are being explored to reduce related monitoring, reporting and verification (MRV) costs. Increased data generally increases accuracy and decreases uncertainty. A better understanding of GHG emissions on a large sample of farms will enable the use of default calculations for individual actions. Existing policy requirements and farm records, for example those related to the Common Agricultural Policy (CAP), can also provide data needed for carbon audits. Self-recorded and reported data from farmers represent another alternative to monitor the implementation and results of the mitigation practices. Network solutions and Application Programming Interfaces (API) are being developed to share input data between organisations. APIs are also elaborated and tested with automatic data collection through sensor platforms (such as cattle collars or eartags).

While the on-site visit by a consultant remains essential to build a relevant mitigation action plan with the farmer, all the previously mentioned alternatives will contribute to minimising MRV costs in the near future and will facilitate upscaling.

A regional approach to reducing the carbon footprint of dairy: Pays de la Loire

The Pays de la Loire region was involved in the development of the Low Carbon Farm scheme thanks to its participation in the LIFE Carbon Dairy project (2013-2018)⁽¹⁹⁾. The results of this project were then translated into national objectives referred to above. The Pays de la Loire region made a political choice to fix even more ambitious objectives and developed its own "Low Carbon Farm" project⁽²⁰⁾ with a longer-term vision. The objective is to include 70% of its dairy sector – i.e. about 5.000 farms out of the 7.500 located in the region - in the Low Carbon Farm scheme by 2026. The Region expects all young farmers to participate. The first regional call for farms interested in carrying out a carbon audit and establishing a low-carbon action plan was launched in 2019 and received about 100 applications. The Region foresees supporting 500 farmers per year in their transition.

Pays de la Loire's Chamber of Agriculture manages the implementation of the project which involves IDELE, the Region, private consulting companies, cooperatives, dairy companies and entails different actions. Every year, selected farmers are provided with a diagnosis of their farm's carbon footprint. They then receive training and personalised advice. With the information received, the farmer, accompanied by an accredited adviser, is able to identify the mitigation practices to include in his/her carbon action plan. After three years of implementation, a second carbon footprint assessment of the farm is carried out. This involves taking stock of the reductions achieved. The first evaluation of the regional initiative is scheduled in 2023, when the farmers who first joined the project will have been implementing the low carbon activities for 5 years.

To implement the initiative, the Region foresees a budget of 8.3 million EUR derived from different funds. EAFRD can be used as co-funding for the collective trainings related to the low-carbon practices. The regional strategy also has a direct link to the RDP's investment measure 4.1.1 that supports farm modernisation, better working conditions and competitiveness, and to the increased energy efficiency measures. Since 2019, the selection criteria for receiving such investment support under the regional RDP has taken into account whether the farm participates in the Low Carbon Dairy Farm scheme. Farms that do have increased chances to obtain the support (even if the planned investment is not used for the low-carbon practices). For certain projects, such as renovation of milking parlours, only farms engaged in the Low Carbon Dairy Farm initiative have been supported by the EAFRD measure for investments in livestock buildings.



(19) https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4699

(20) https://www.paysdelaloire.fr/uploads/tx_oacsnewsfiles/RI_Fermes_Bas_Carbone_-_juin_2019.pdf