

Resilience for Dairy (R4D) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000770



# CAP'2ER® tool and Carbon farming schemes in French livestock farms

*Elisabeth Castellan*

10/05/2023

- CAP'2ER® tool: method, use at an European level
- Dairy farm results in different systems



- Implementation in dairy farms
- Economical compensation with carbon credits

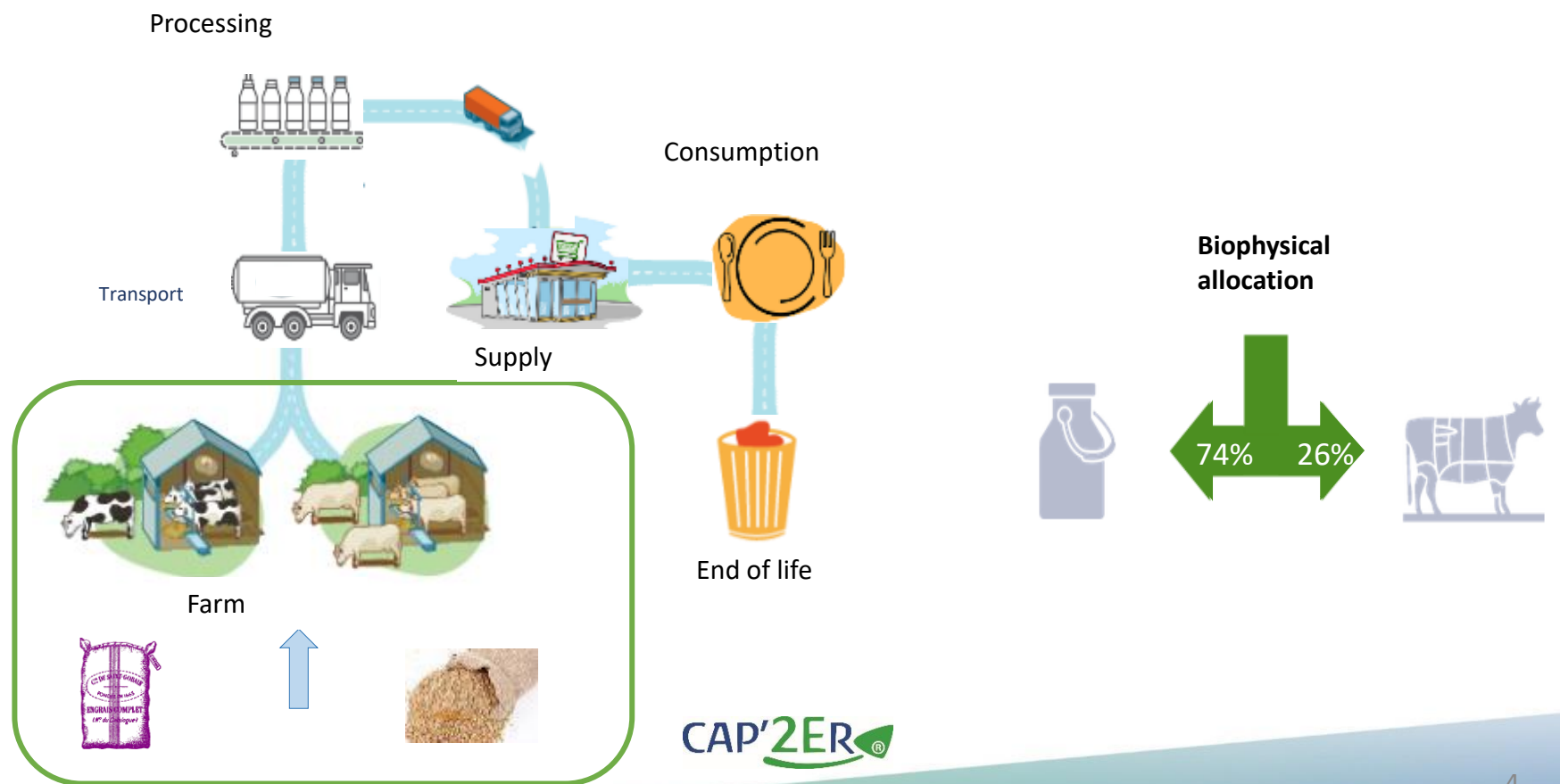


CAP'2ER<sup>®</sup>

CAP'2ER<sup>®</sup> tool

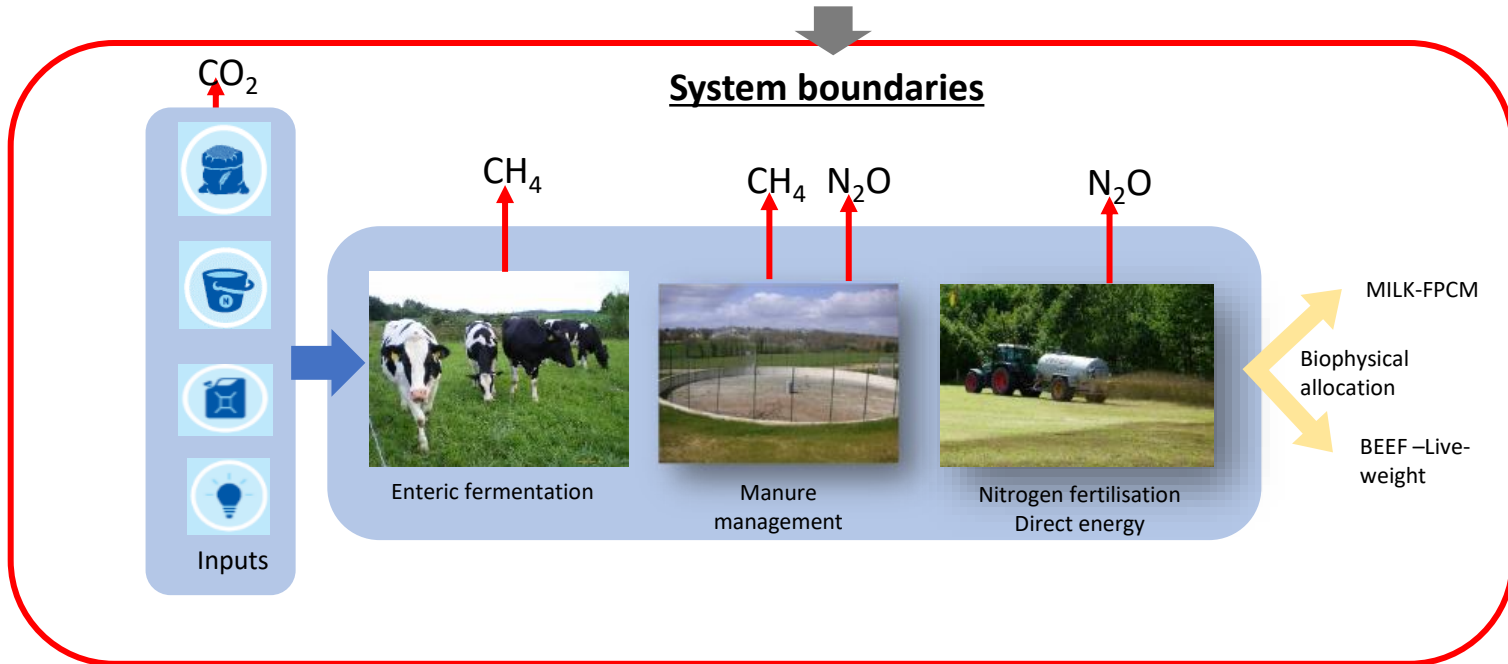
# Life Cycle Analysis

- Farm level # 90% of the total impact



# The system boundaries

A LCA analysis at farm level





# An environmental analysis in livestock

Animal categories				
Environmental burdens	<p><b>Greenhouse gases emissions</b> kg CH<sub>4</sub>, kg N<sub>2</sub>O, kg CO<sub>2</sub> → kg CO<sub>2</sub> eq</p>	<p>Air quality (ammonia) → Kg N/ha</p>	<p>Water quality → Kg N/ha</p>	<p><b>Energy consumption</b> Direct and indirect energy → MJ</p>
Positives contributions	<p><b>Carbon sequestration</b> kg carbon /year</p>	<p><b>Conservation of biodiversity</b> ha eq of biodiversity</p>	<p><b>Food performance</b> Number of fed people/year <small>Perfalim*</small></p>	

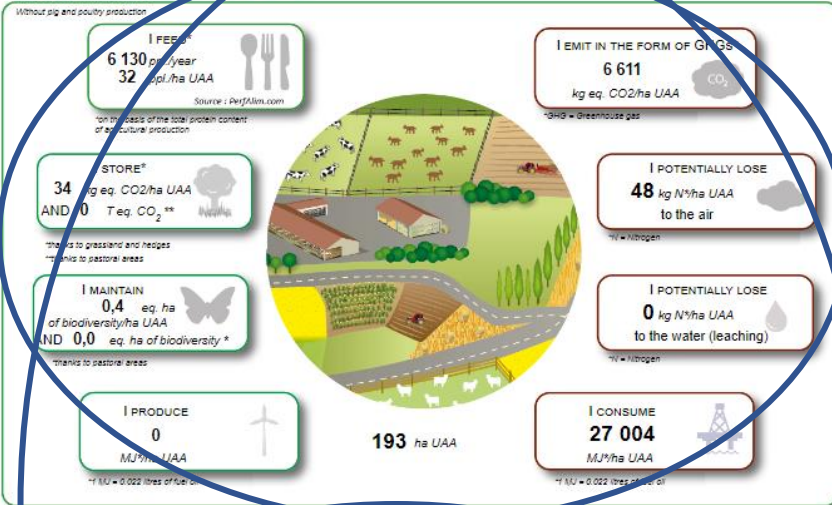
**Level 1:** cattle level  
30 input data  
= *educational tool*

**Level 2:** farm level  
150 input data  
= *tool to evaluate and build action plan*

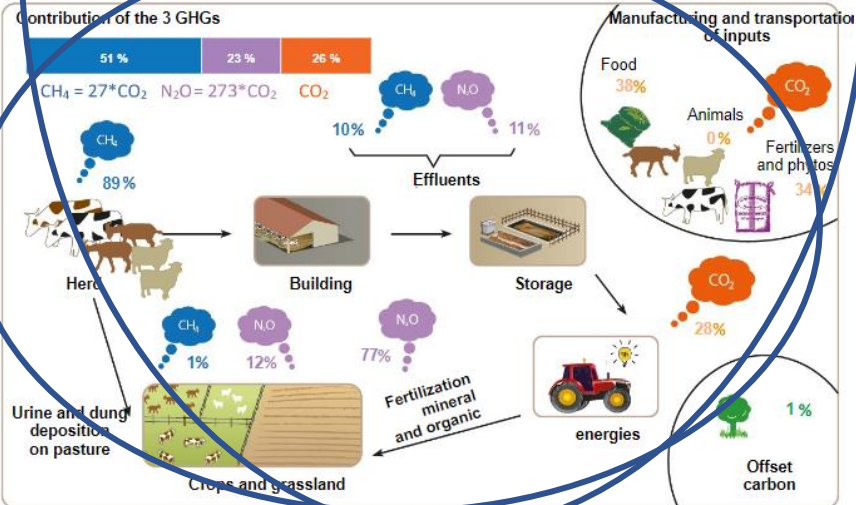
Available in different languages with possibilities to have local references and parameters



## THE ENVIRONMENTAL IMPACT OF MY FARM

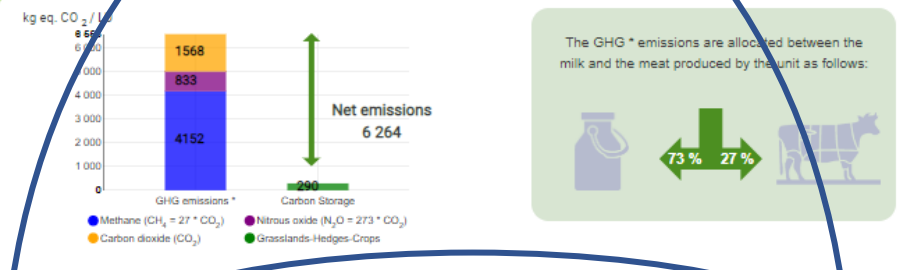


## GHG SOURCES AT THE SCALE OF MY FARM

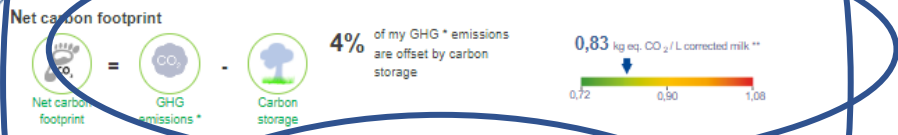


## CAP'ZER Level 2

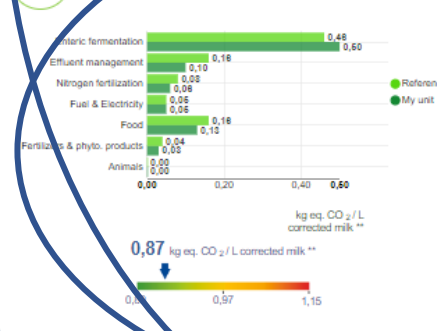
### GHG\* AND CARBON STORAGE OF MY UNIT



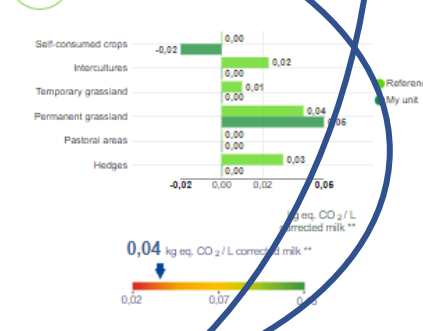
### MILK PRODUCT RESULTS



### GHG emissions\* (CH<sub>4</sub>, N<sub>2</sub>O and CO<sub>2</sub>)



### Carbon storage



# Dairy farm results in different systems

**CAP'2ER** 



# Milk carbon footprint

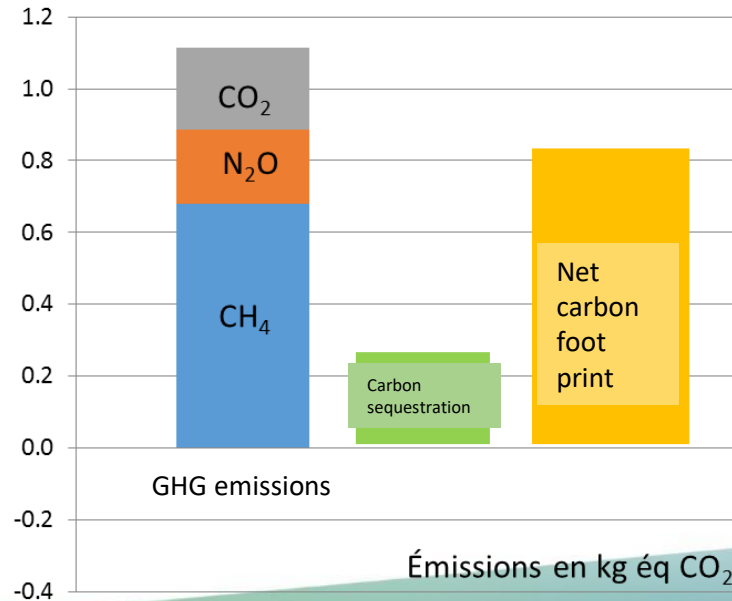
## • 2 types of results :

- GHG emissions
- Net emissions = carbon footprint
- in kg eq CO<sub>2</sub>

GHG	GWP
CO <sub>2</sub>	1
CH <sub>4</sub>	27
N <sub>2</sub> O	273



Boundaries = dairy cattle + forage area + crops farm-consumption



Milk footprint

*Biophysical allocation*

Dairy meat footprint

# Analysis of the data base CAP'2ER<sup>®</sup> level 2



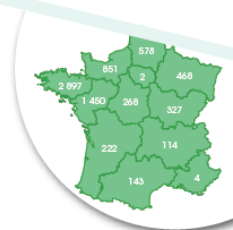
CAP'2ER<sup>®</sup>



Résultats CAP'2ER<sup>®</sup> :

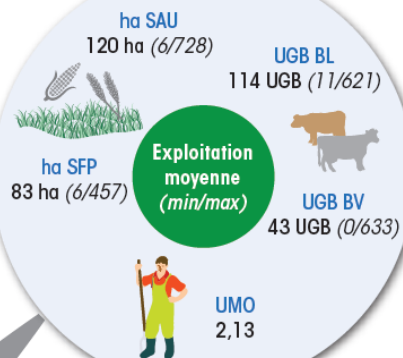
Système France

Années 2013 à 2021

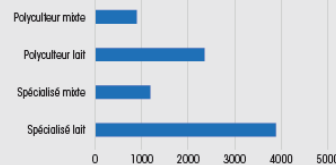


7324 diagnostics

Exploitation

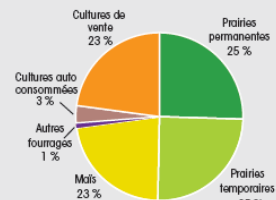


Typologie\* des exploitations



\* polyculteur si SFP/SAU < 0,7 et viande UGB BV > 8.

Assolement moyen



# Milk carbon footprint

**GHG emission** – **Carbon sequestration** = **Net carbon footprint**



–



=



kg eq.  
CO<sub>2</sub>/l  
milk

1.01

–

0.15

=

0.86

Source : données CAP'2ER 2013-2021 FRANCE



# GHG sources at the dairy part scale

**Total**

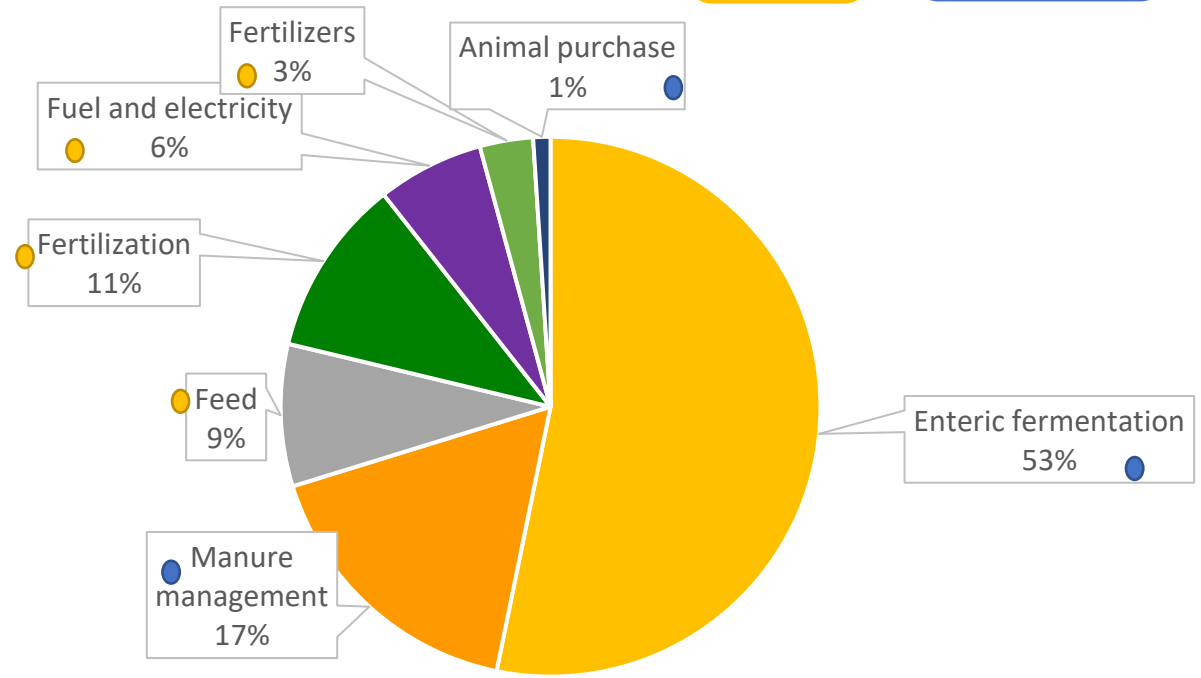


**1.01**

kg éq. CO<sub>2</sub>/l milk

**Feed**  
Forages + concentrates  
**30%**

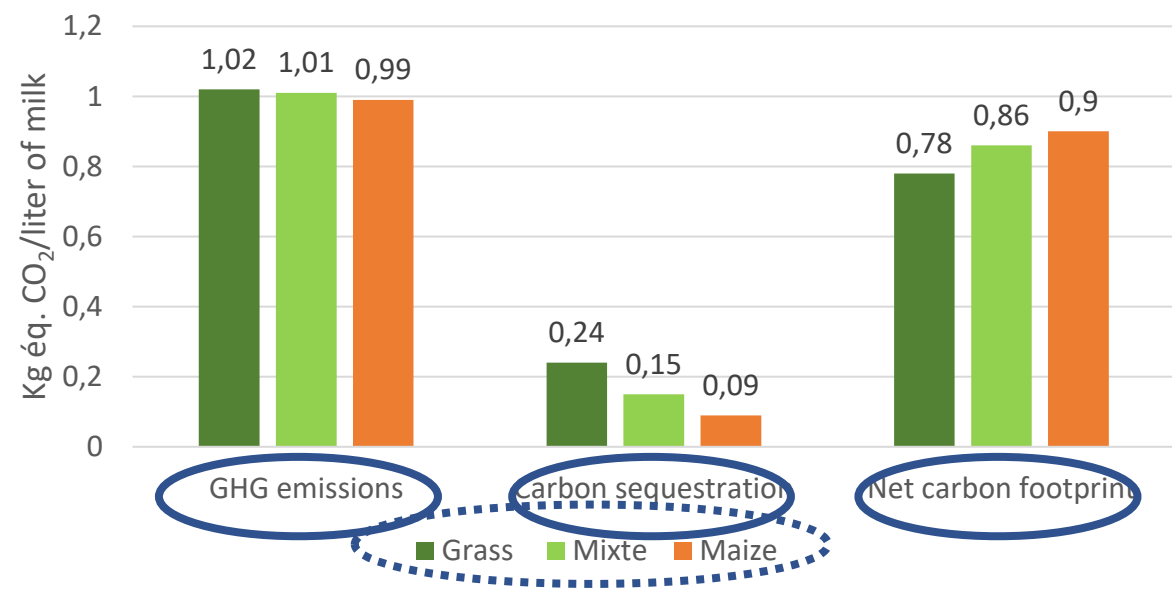
**Cattle**  
Enteric fermentation + manure + animal purchase  
**70%**



→ Enteric fermentation is more than half of GHG emissions on a dairy farm

# Results for plain system

Milk carbon footprint- Plain system



High intra system variability : -19% between average and top 10

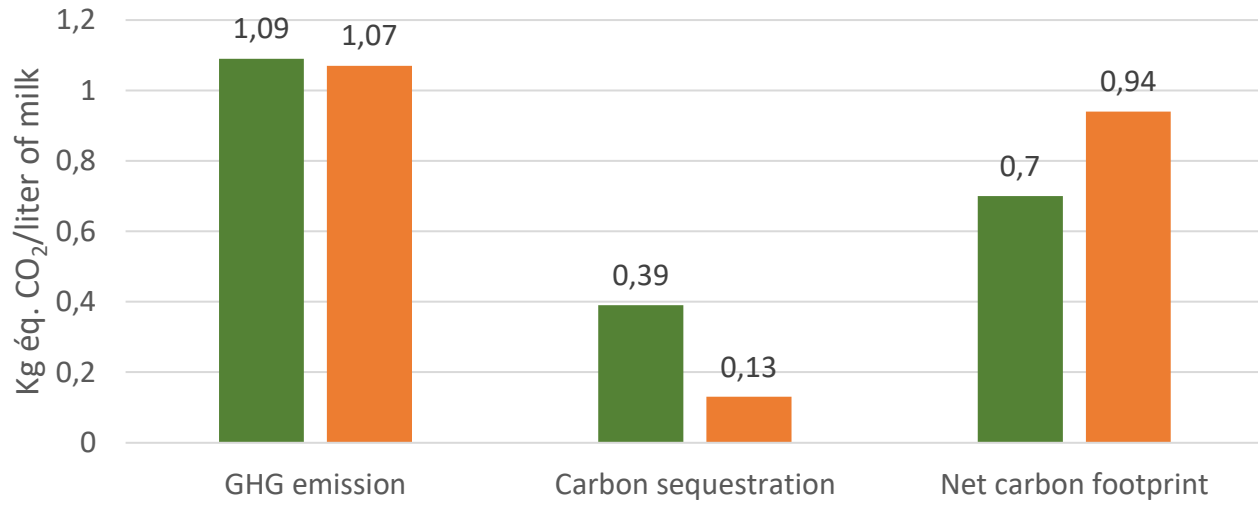
Source : données CAP'2ER 2013-2021 FRANCE



**GHG emissions are the same in the différents systems.  
Difference in net carbon footprint is due to carbon sequestration.**

# Results for mountain system

Milk carbon footprint- Mountain system



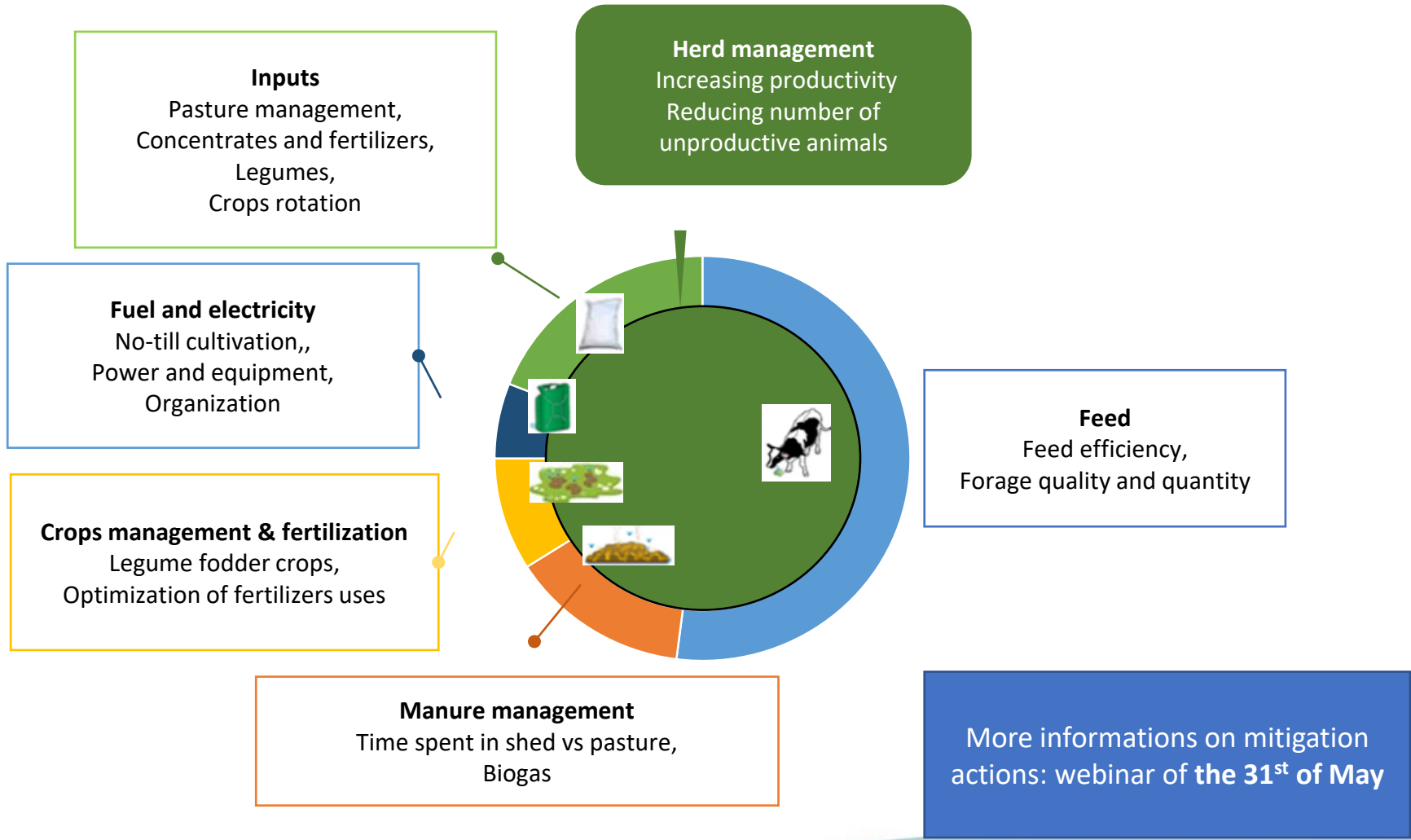
Source : données CAP'2ER 2013-2021 FRANCE

■ Grass ■ Maize



**GHG emissions are the same in the différents systems.  
Difference in net carbon footprint is due to carbon sequestration.**

# Mitigation actions







# Implementation in dairy farms in France

# CAP'2ER® POURSUIT SA PROGRESSION

Pour évaluer les performances environnementales et la durabilité des exploitations

## UN OUTIL EN PLEIN ESSOR

Nombre cumulé de diagnostics CAP'2ER® réalisés en France depuis 2015



**29 300** diagnostics CAP'2ER® réalisés depuis 2015 en lien avec 4 initiatives



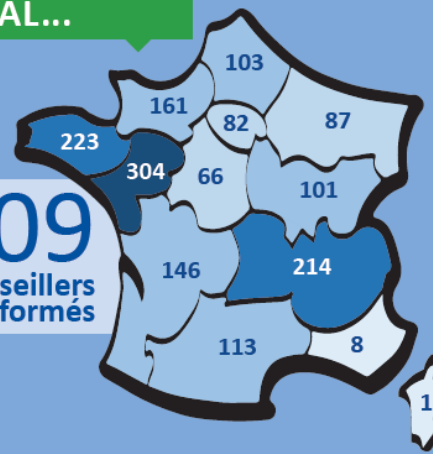
## UN LARGE PARTENARIAT



## UN DÉPLOIEMENT NATIONAL...



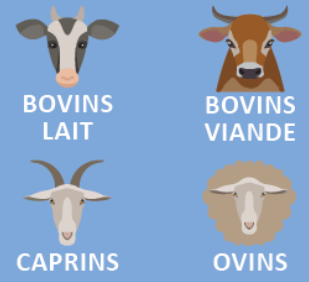
**1 609** conseillers formés



## ... MAIS AUSSI EUROPÉEN



## UNE AVENTURE MULTIFILIÈRE



GRANDES CULTURES

29 300 diagnoses – 1609 trained advisors

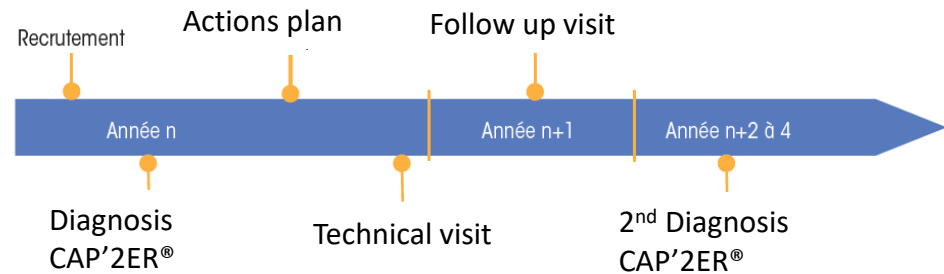


# Dissemination through a large partnership



Initiatives supported by the French dairy sector

= Support farmers in an improvement process



Involvement in the dissemination: advisory organizations, dairy companies  
Financial support : regions, dairy firms

# Economical compensation with carbon credits

# Label Bas Carbone – 3 objectives

## Launch new actions to reduce the emissions and sequester carbon :

- Foster the emergence in various sectors, of projects which go beyond regulation and usual practices (additional projects which would not have been launched without the Label)

## Certify the quality and the impact of the projects:

- CO2 gains (reduction or sequestration), direct et indirect
- environmental impacts (positive or neutral)

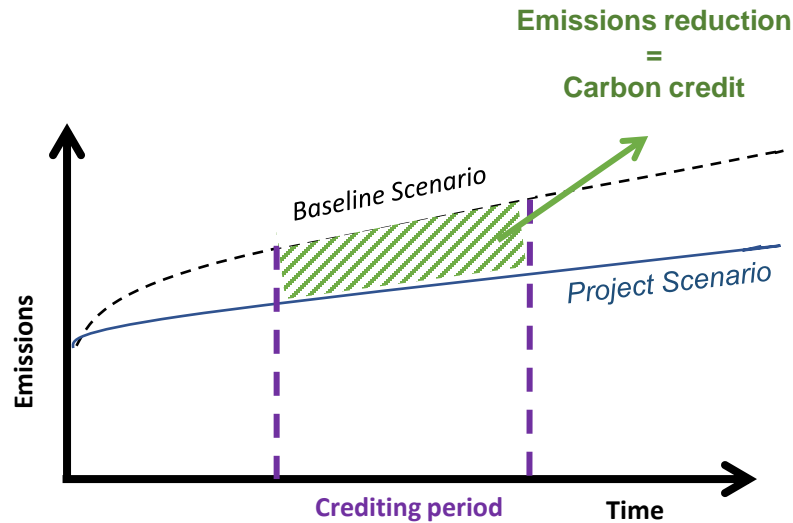
## Attract funding towards these projects :

- Growing interest for local projects for decarbonation (with environmental and climate impacts)
- Funders : communities, citizens, companies (exclusive of UE-ETS, CORSIA)





# CARBON AGRI : a French methodology to certify GHG reductions in agriculture



Certification process →



- Scope concerns cattle and crop productions
- A methodology approved by the French Ministry of Ecological Transition



RÉPUBLIQUE FRANÇAISE

Ministère de la transition écologique et  
solidaire



Direction générale de l'énergie et du climat

Décision du 30 septembre 2019

portant approbation d'une méthode pour le label « Bas-Carbone » intitulée « méthode de suivi des réductions d'émissions en élevages bovins et de grandes cultures conforme au label Bas-Carbone »

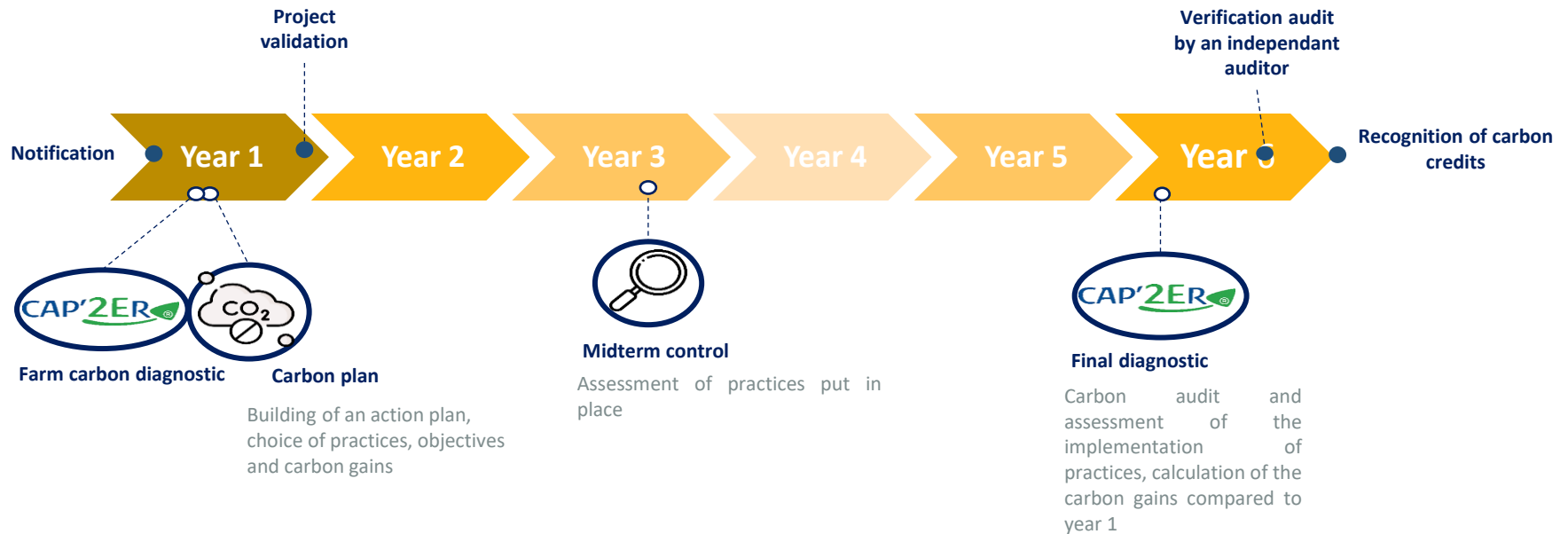
# CARBON AGRI : A result-based methodology





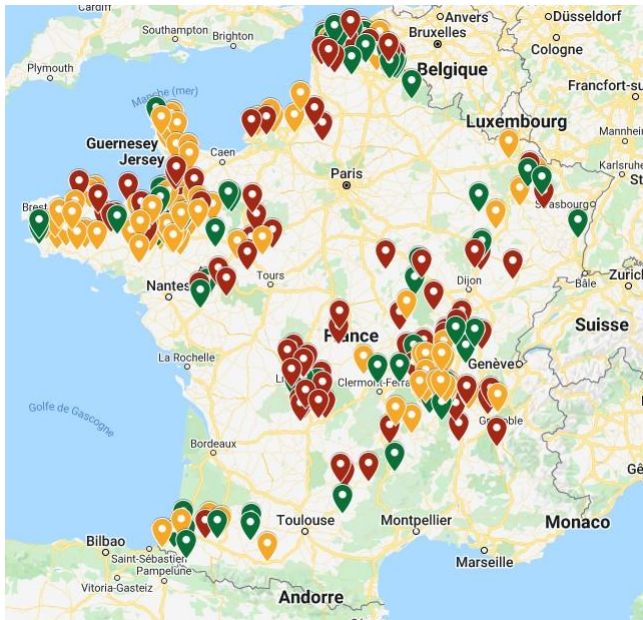
# CARBON AGRICULTURE : schedule

Maximum duration: 5 years, revolving project for 5 years



# France CARBON AGRI Association

## 2 projects involving 1300 farmers



**Buyers** are: banks, luxury companies, agrifood industries, restaurant chains, energy companies, cooperatives, etc.

**Purchase criteria:** farms location, practices implemented, co-benefits, type of production

**1<sup>st</sup> project accredited 2020**  
 - 300 farmers  
 - 137,000 t CO<sub>2</sub> reductions

**2<sup>nd</sup> project accredited 2022**  
 - 960 farmers  
 - 580,000 t CO<sub>2</sub> reductions

**3<sup>rd</sup> project on going**  
 - 1,700 farmers

**Reduction of carbon intensity : 14 %**

**After 5 years project :  
 From 450 to 600 tons of carbon (30€/t for the farmer)**





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# Thanks for your attention !

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