



EAAP Porto 2022



UNDERSTANDING THE GREENHOUSE GAS AND AMMONIA MITIGATION STRATEGIES IN FRENCH DAIRY FARMS

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The CCC Farming project

Production efficiency and
climate protection



January 2020

40 months

June 2023



Develop cattle production systems that reduce GHG and ammonia emissions, while maintaining the socio-economic prospects of the farm business

Provide an **assessment of the environmental performance of a network of farms**

- Agri-environmental assessment tools
- Simple methods for measuring emissions
- Point of view of farmers on climate issues, interests / obstacles, in order to implement practices to mitigate gas emissions (GHG and NH3)



CAP'2ER performed on farm

1 (2021)

Gaseous emissions measurements

4 (2021 et 2022)*

Approach to "Climate Issues"

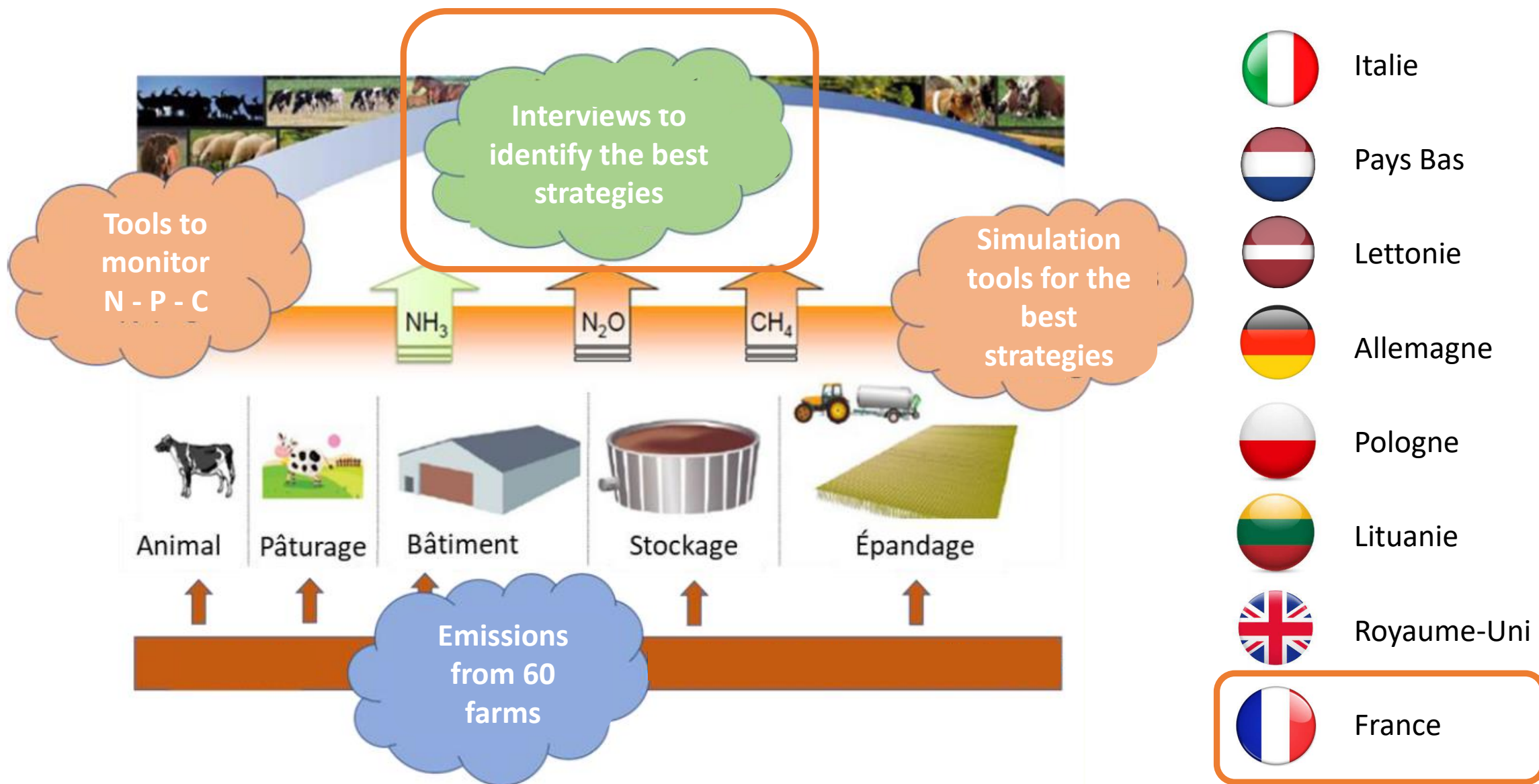
2 (early 2021 and end 2022)

Questionnaire



To study and provide information on the **effect of a combination of practices that reduce gaseous emissions** at the agricultural system level

The CCC Farming project



Panel of farms

Arable land : 40 to 250 ha

Grassland : 30 to 90 ha (5/8 with clover mix)

1 organic farm, 4 research farm

Feeding system : 6 at the trough

% grazing : 0 to 85%

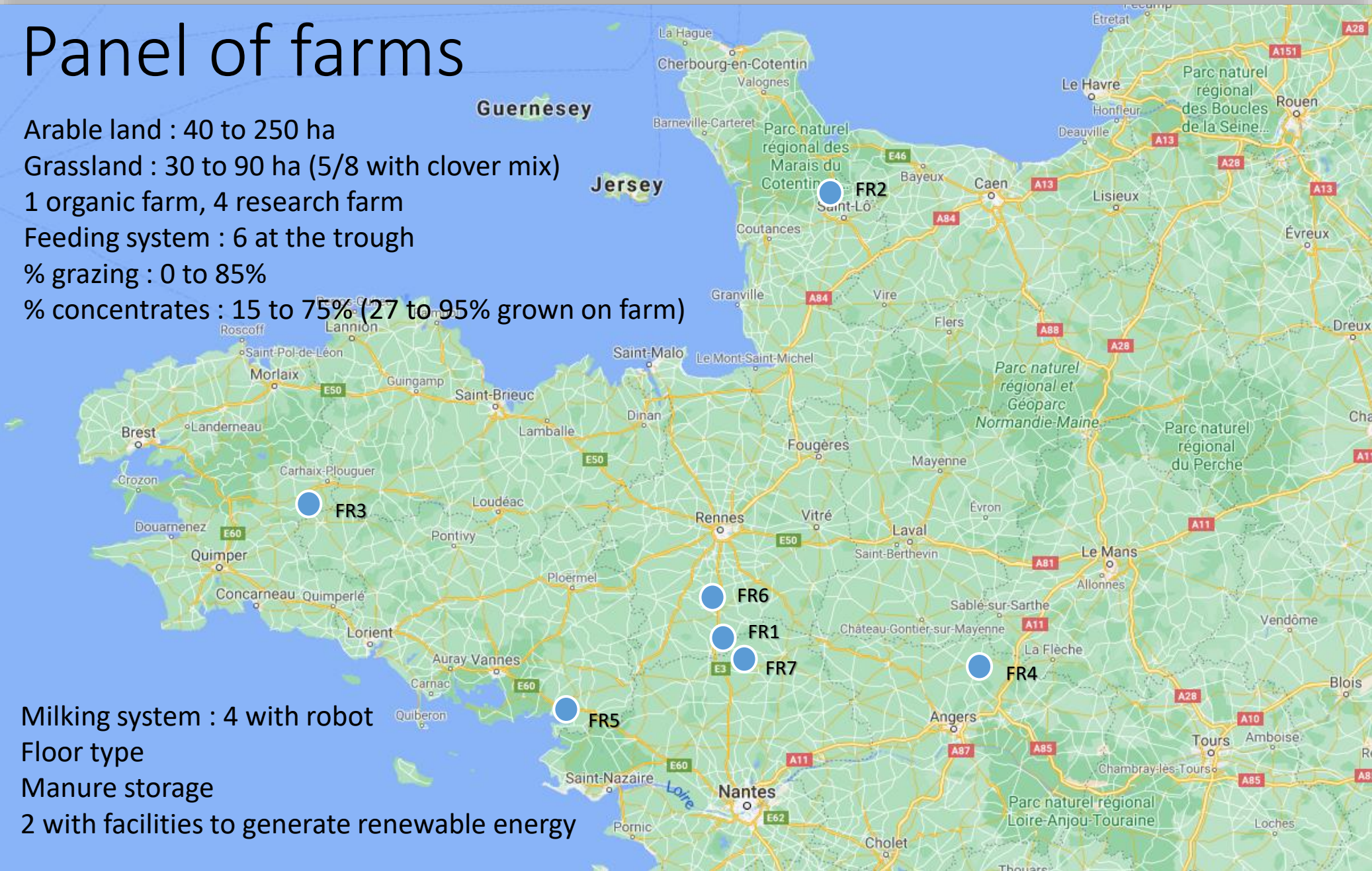
% concentrates : 15 to 75% (27 to 95% grown on farm)

Milking system : 4 with robot

Floor type

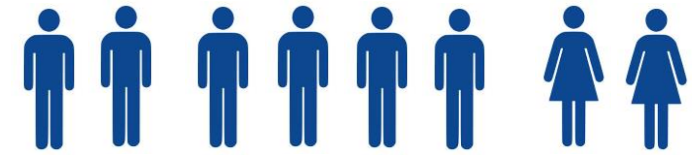
Manure storage

2 with facilities to generate renewable energy



Panel farms and farmers

Main farmer characteristics



Main farm characteristics



2,5 to 11 employees

4/8 from 50 à 90 k€ / year

4/8 have 30% of their income from diversification or non-farm activities



5/8 have obligations to implement sustainable practices: organic, HEV...



■ < 35 ans ■ 36-45 ans
■ 46-55 ■ 56-65 ans

6/8 > 20 years of experience



6/8 > educated at tertiary level

Farmers' networking and information sources



7/8 > 20 meeting farmers * / year

7/8 engaged in **multiple research projects** concerning **environment or sustainability**

For 3/8, half of the **events monitored** concern the **environment or sustainability**

All use agricultural contractors

5/8 involved in one or more unions, cooperatives or associations

* Network : **advisors** and researchers, milk controller, vets, **accountants**, **administrators**, peers, commercials, cooperatives

* Events : Technical days and open farms, farmers' groups, unions meetings



Level of knowledge of the link between agricultural practices and GHG & carbon emissions

Perception between agriculture and environment

Awareness of their responsibility on the environment BUT overestimated by the society (8/8)

Ready to make improvements BUT with conditions:

- Income maintenance
- A collective commitment

Belief that sustainable agricultural practices can create business opportunities (6/8)

Farmers' understanding of GHG and NH₃

All have **heard of GHGs, carbon footprints and NH₃**, and all believe that agriculture contributes:

- Significantly (4/8) or slightly (4/8) to GHG emissions
- A little bit (2/8) or a lot (6/8) to NH₃ emissions

6/8 producers have already assessed the carbon footprint on their farm (via CAP2ER (5/8))

Importance of farm management for the long-term financial viability of the farm

Not important

Very important



Technology and automation

5/8 to try new technologies,
2/8 ready to do so (2/8)

"We can't find any more employees in breeding"

Farm management (contracts, HR)
Machinery / fuel
Meadow and pasture management

Animal management: feeding, breeding, health, housing
Fertilization / Spreading
Irrigation / Drain
Field crop management
Breeder well-being: workload, health, agribashing
Peer-to-peer exchanges

Importance farm management on GHG and Carbon emissions

Not important

Very important



Animal health
Irrigation / Drain
Farm management
(contracts, HR)

Different environmental
management standards for
different stakeholders

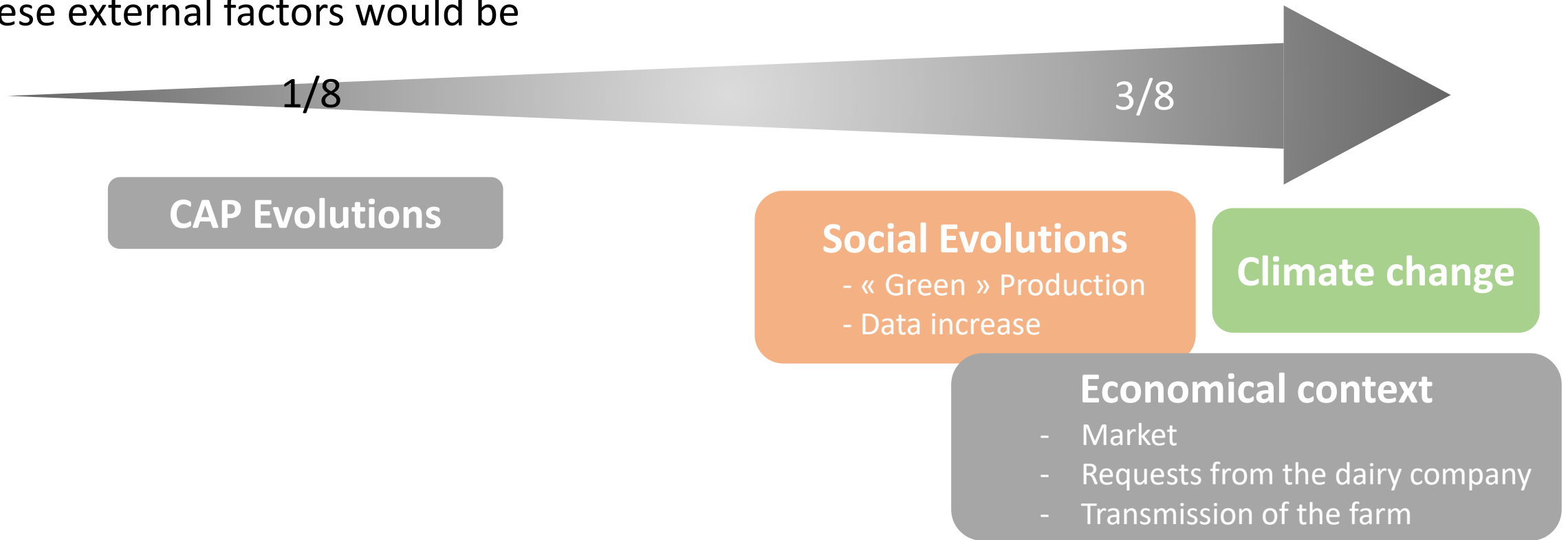
Personal conviction
Territorial Climate Air and
Energy Plan
Societal expectations

*"Be careful not to affect negatively
the milk production"*

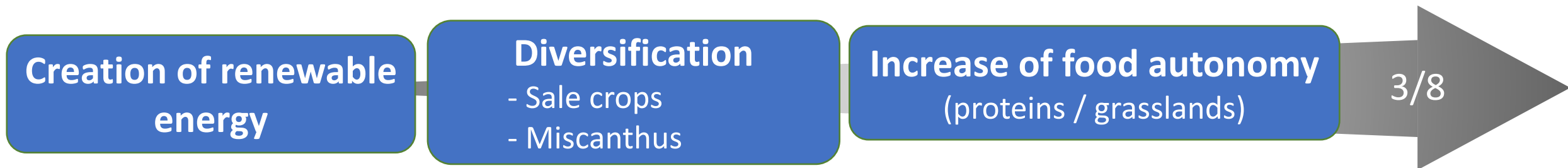
Animal management: feeding,
breeding, housing
Fertilization / Spreading
Field crop management
Meadow and pasture management
Machinery / fuel
Technology and automation

Changes on the farm

These external factors would be



Future changes considered to adapt to new external factors



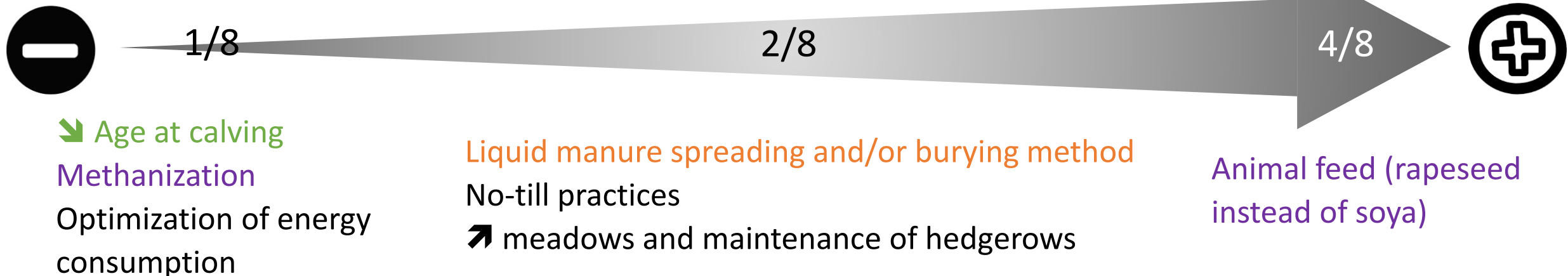
Changes to ↘ GHG emissions or ↗ carbon sequestration

Levers to motivate changes in practices

- **First levers:** those linked to **public policies** (increased regulatory pressure, education on sustainable practices) or **to markets** (dairies)
- **Second levers:**
 - Economic: increased **subsidies**
 - Social: increased **local community pressure**

Changes already made

6/8 producers have already made at least 2 changes on the farm



GHG mitigation measures or ↗ carbon sequestration

Changes considered in the next 5 years (7/8)

8/8 willing to make changes

No-till practices or ↘ tillage

↗ Share of hedgerows

Liquid manure spreading and/or burying

Animal feed (feed efficiency)

Methanization

Optimization of energy consumption

Impact on global emissions (GES)

Impact on Methane (CH₄)

Impact on Carbon (CO₂)

Impact on Ammoniac (NH₃)

"I am still in this logic of change, but I don't know which ones yet"

"We reached the limit of what we could do on soil management and feeding, with a lot of difficulties with green feeding"

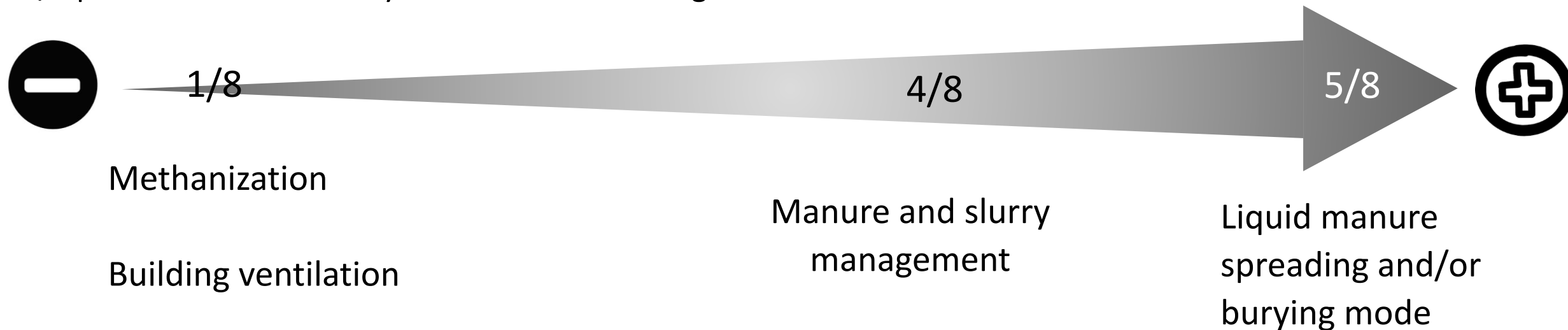
Changes considered but abandoned (3/8)

To expensive, finally not adaptable on the farm, too much extra work, lack of knowledge

Changes to ↘ NH3 emissions

Changes already made

7/8 producers have already made at least 2 changes on the farm



Changes considered in the next 5 years (5/8)

Manure and slurry management

Building layout (stalls)

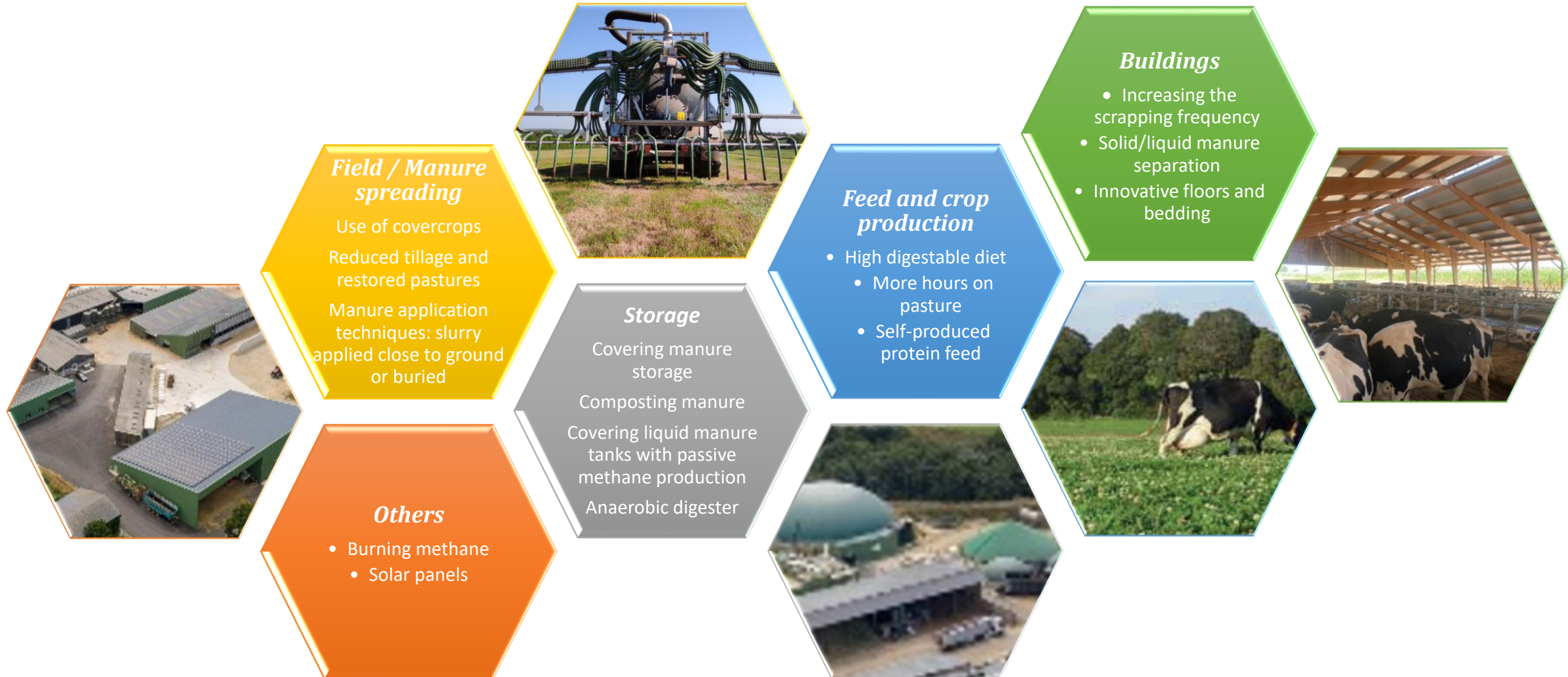
Among those who do not plan to change in 5 years:

- One has just launched his new project > changes are already done
- One is waiting for the results of ongoing experiments

Conclusion

French panel stands out for its :

- **Sensitivity to environmental issues**
- **Curiosity to seek information on this topic**
- **Openness to innovative practices** that improve the environmental footprint of systems



Conclusion

Very good knowledge about practices and their impact on environmental issues

⇒ Explained by :

- The farmers profiles : **experimented and well educated** (from experimental farm or true business owner)
- Diversified **french consulting panorama**
- Impetus generated by european and national **environnemental policies and regulations**

Even on this kind of panel **some practices not yet well known** ⇒ **to improve**

➔ **GES Mitigation trend** when farmers are aware of the link practices / environment

- BUT**
- Those who have the best knowledge are not the most virtuous : **a lot system dependant**
 - For a similar situation (e.g. animals in a building), gas emissions can **vary a lot depending on the facilities and practices** (e.g. regular scraping)

Knowledge is necessary but not sufficient

Limits between virtuous practices and technical & financial reality



Thank you for your attention

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