



From carbon sequestration in agricultural soils to the table :

How to achieve net zero in our consumer products while promoting food safety?

eurofins

EnvironeX



# About us

Eurofins is a world leader in **environment, agrifood, pharmaceutical and agricultural** testing laboratory.

Eurofins Environex is the most important testing laboratory in **Quebec**.

**600** specialists, technicians and managers

**10** service points

**5** laboratories

**100,000 ft<sup>2</sup>**

laboratory surface

**+ 2,000,000**

analyses per year



# Part 1

## The basics



# Climate crisis

More frequent and more intense extreme weather events

Biodiversity loss

Insect pests

Food insecurity

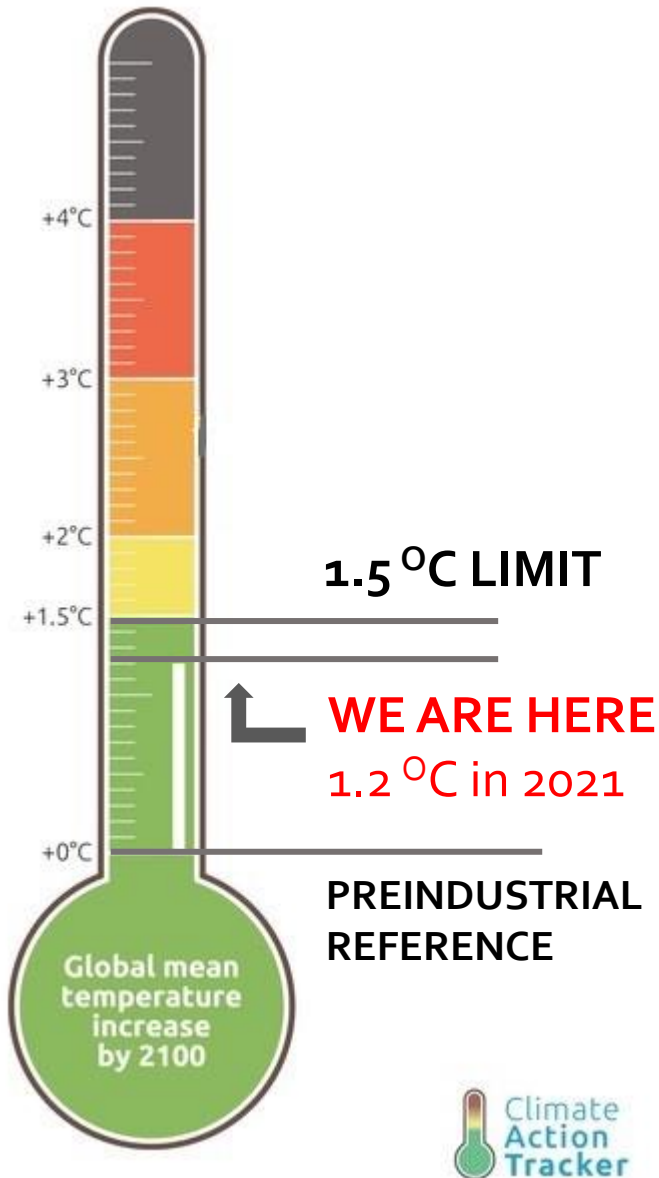
Economic impacts

Etc.



Source: Le Devoir

# We must take action now!



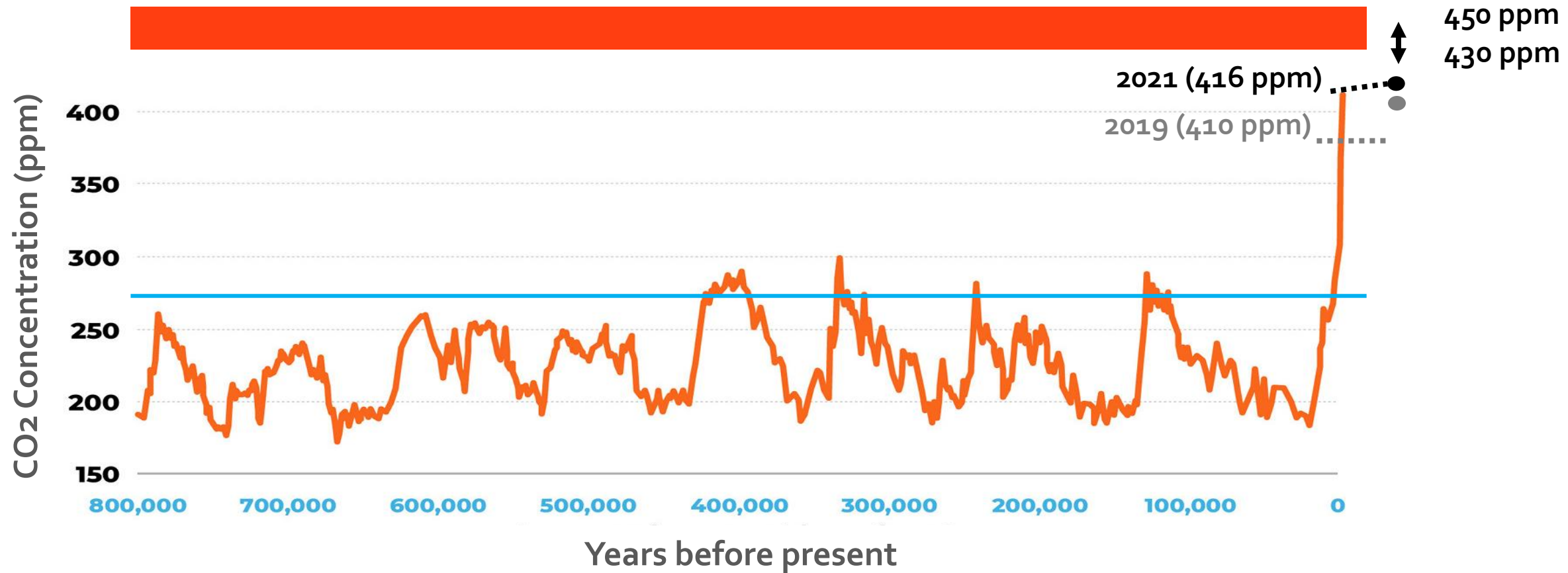
The New York Times

## *Stopping Climate Change Is Doable, but Time Is Short, U.N. Panel Warns*

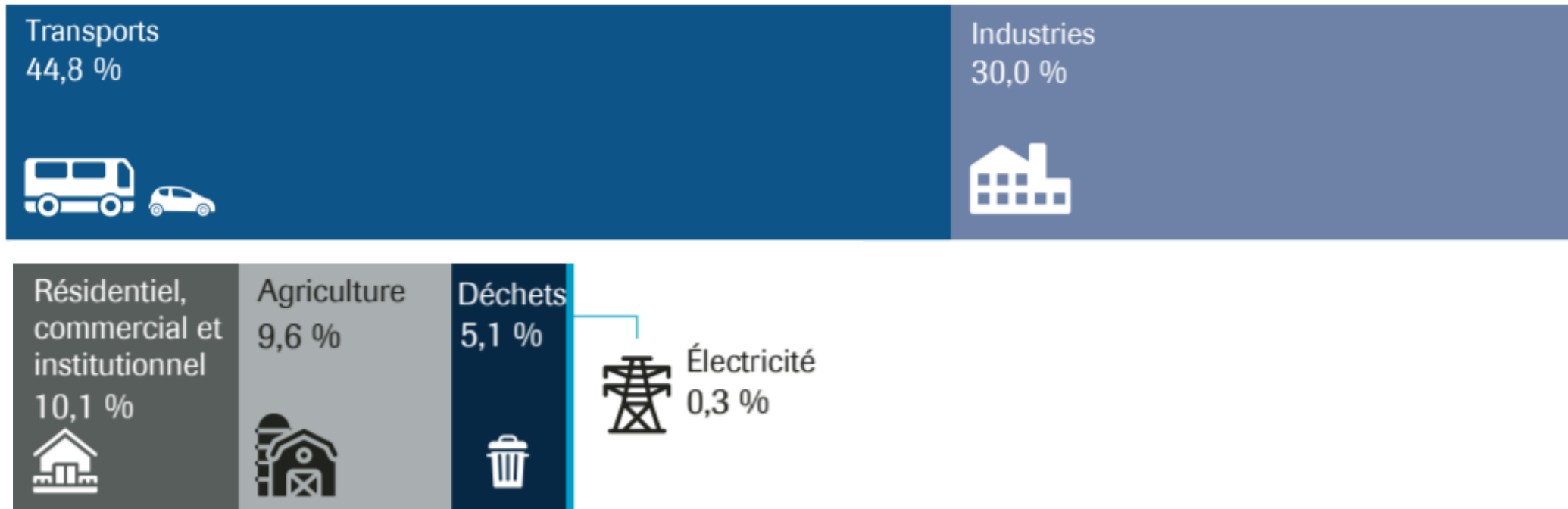
A major new scientific report offers a road map for how countries can limit global warming, but warns that the margin for error is vanishingly small.



# We must take action now!

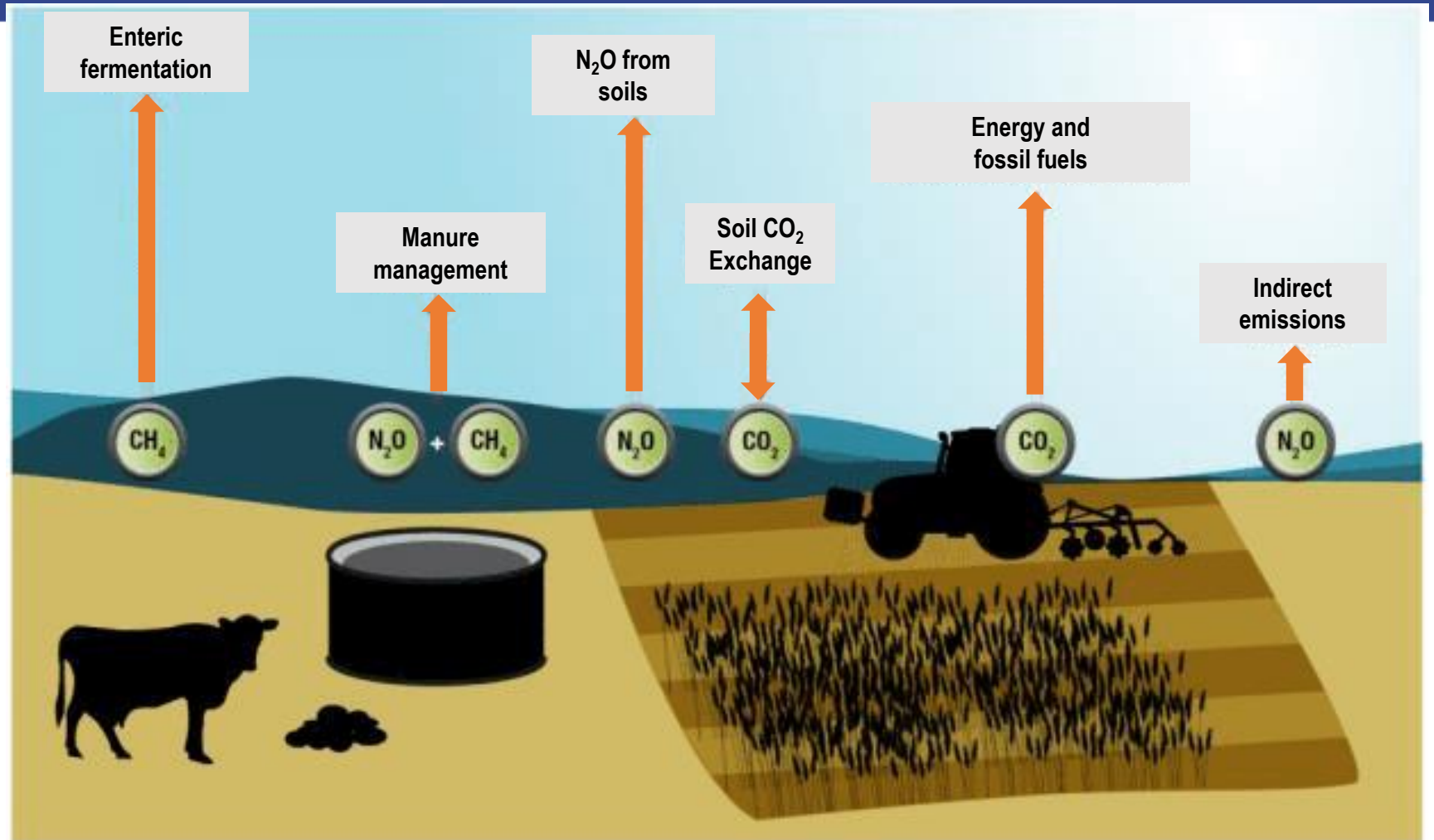
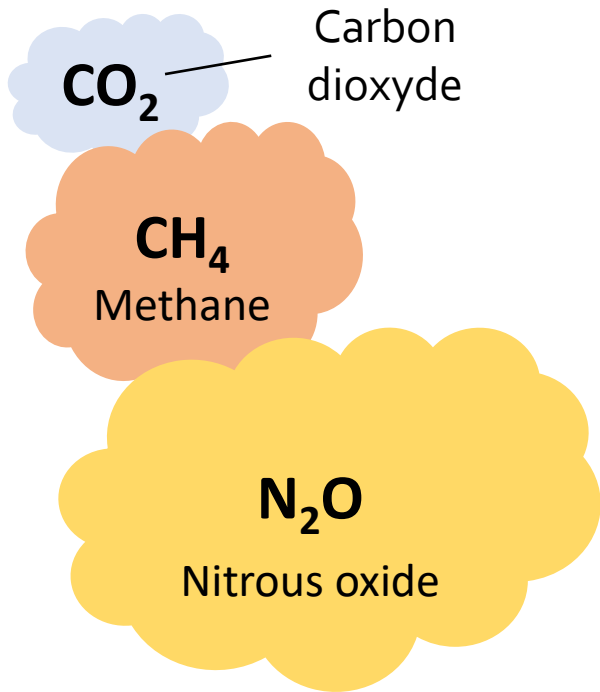


# GHGs in Quebec



12% increase in agricultural GHG emissions between 1990 and 2019

# GHGs in agriculture



Emissions accounted for in  
CO<sub>2</sub> equivalents (CO<sub>2</sub>e)



# Part 2

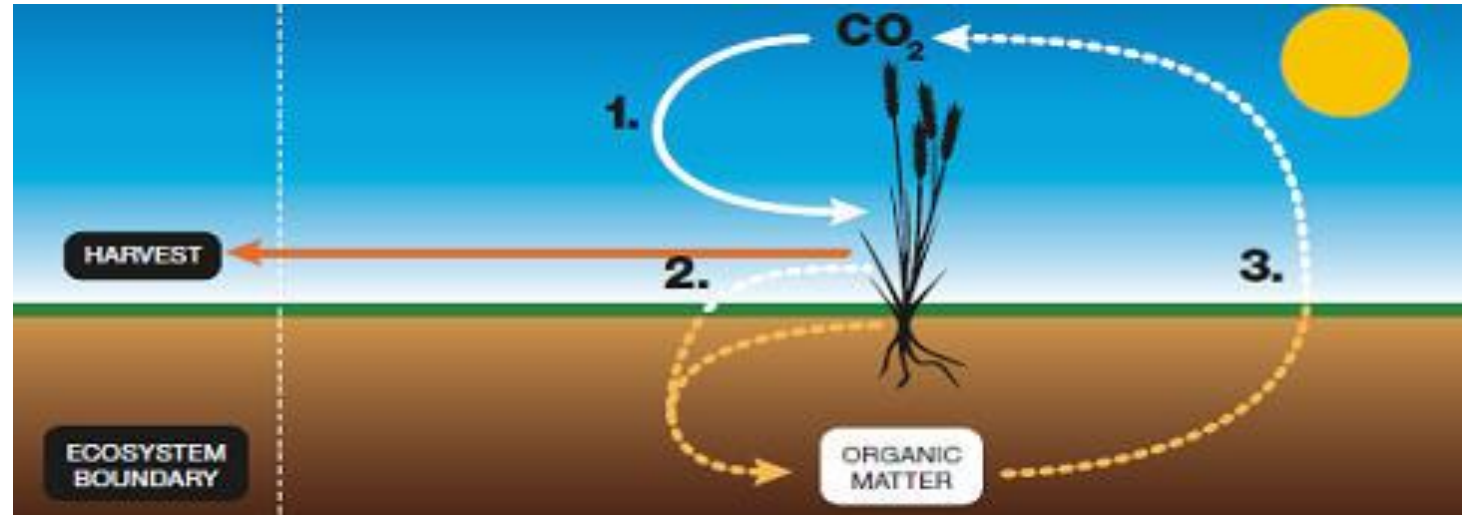
## Regenerative agriculture



From carbon source to carbon sink

Soils represent the 2<sup>nd</sup> largest carbon reservoir on Earth

Carbon is stored in soil organic matter



Farmers are in a unique position: they can reduce GHG emissions **AND REMOVE** CO<sub>2</sub> from the atmosphere.

This is carbon farming, where food production becomes a means to soil health and fertility, to food security and a tool to avoid a climate crisis.

»» Farmers, you are the cavalry! ««

# Organic matter

Around 4% of soil

4 ecosystemic services:



Soil fertility



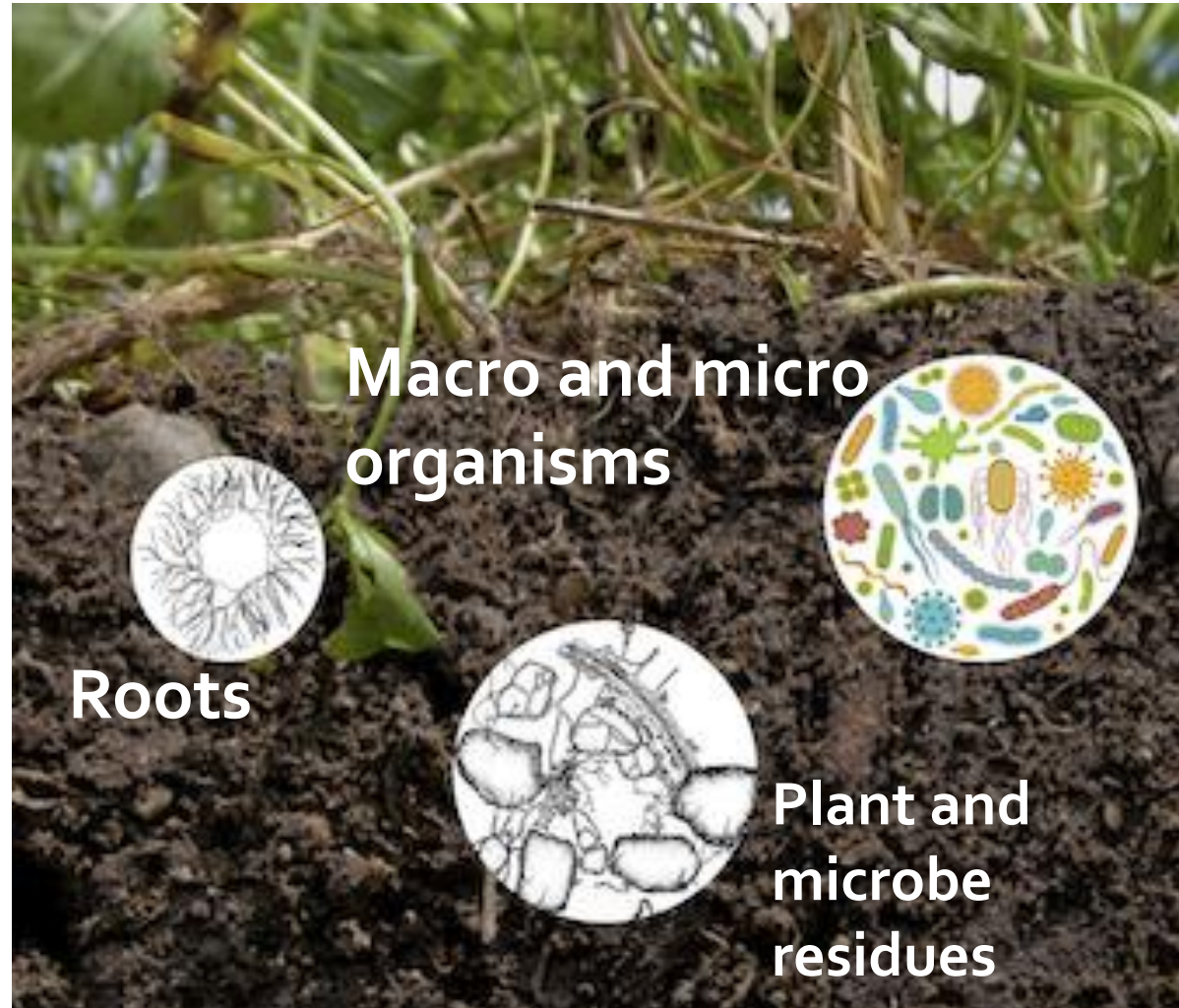
Water retention



Resistance to erosion



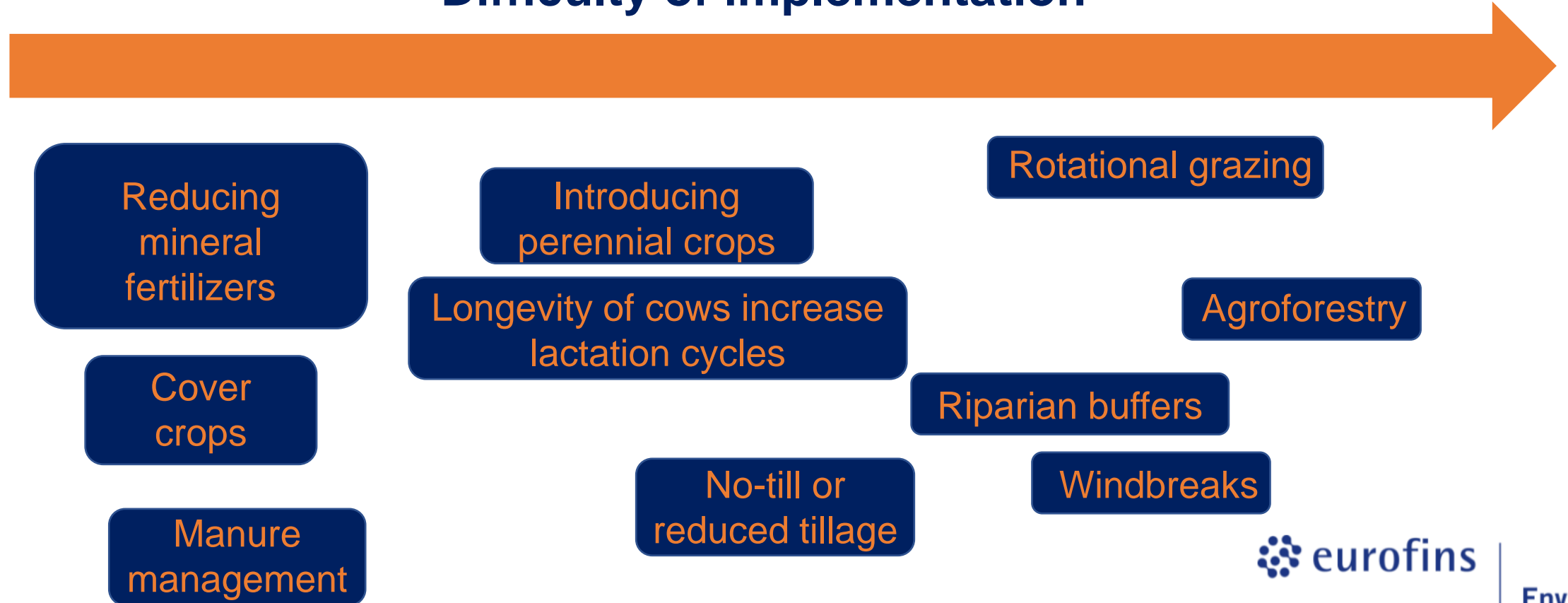
Biodiversity



Adapted from: Équiterre, [Climate agriculture: A solution from the soil, April 2020](#)

# A range of regenerative practices

Difficulty of implementation



# Reduce the amount of mineral fertilizers

Upward trend in nitrogenous fertilizer inputs

Too much nitrogen {  
↑ N<sub>2</sub>O emissions  
Environmental impacts  
Unnecessary costs

**Objective:** apply only what corresponds to the real needs of the crops, at the right time

# Cover crops

## Objectives:

Keep the soil covered year round

Maintain a living root system as long as possible

Increase the biomass produced and returned to the soil

# Cover & perennial crops green manures



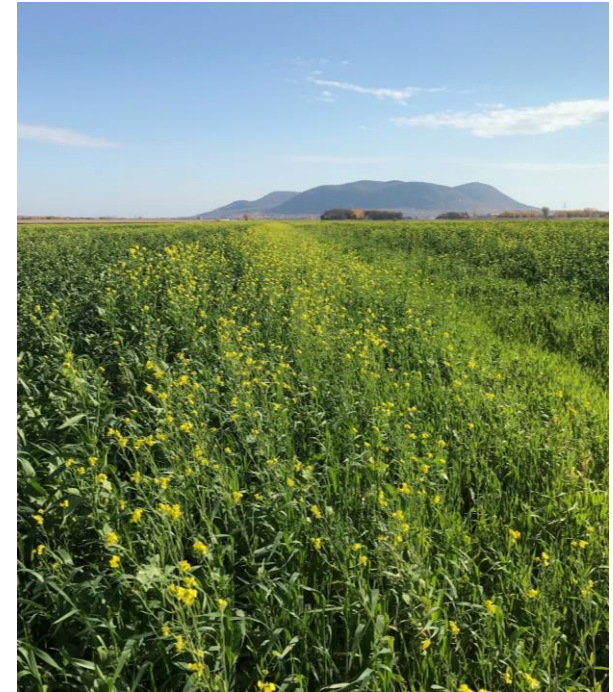
## Catch crop

Sown after the main crop,  
covers the whole field



## Intercropping

Sown during the main crop



## Green manure

Sown at the end of the  
summer and buried in the fall

Examples of green manure crops: mustard, oats, peas, buckwheat, raygrass  
Examples of perennial crops: hay, alfalfa, clover, fescue

# Part 3

## Tons of CO<sub>2</sub>e: A new product





# Climate transition at the farm

Measure and evaluate



**Greenhouse gas inventory for the farm** Complies with the GES protocol, the most used protocol in the food industry

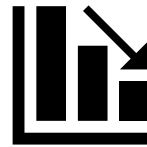
1



**Measuring soil carbon**

Sampling  
LaserAg technology

Measure and record



**Implementation and monitoring of regenerative practices** Measure the impact on GHG inventory and soil carbon

2



**Certification of results**

Compliance and transparency to ensure emissions reductions are recognized as valid

3



**Sell carbon credit on Marketplace (ESMC)**



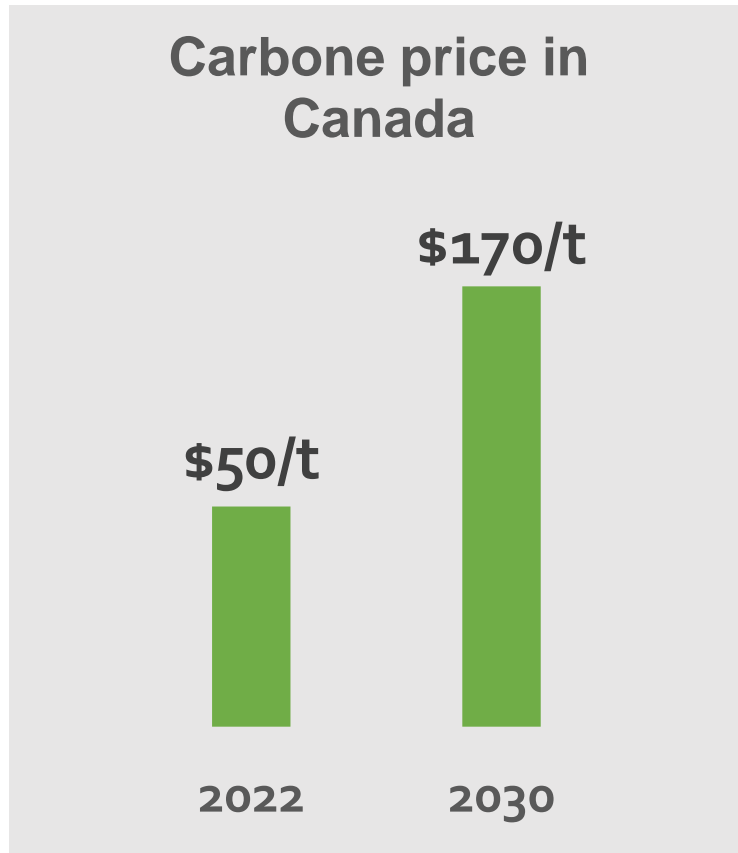
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**Conduct a GHG inventory before adopting new practices**



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# How much is 1 ton of CO<sub>2</sub>e worth?



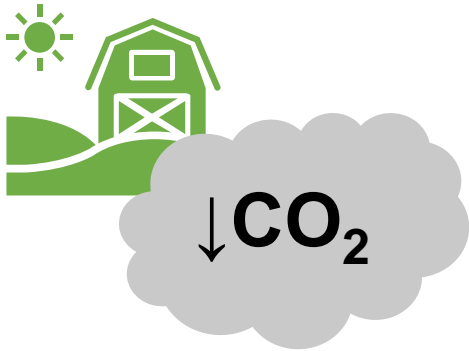
## Farmers will have a choice:

- Keep their reductions in the value chain
- Sell them as offsets

The value of offset credits in the federal market will dictate the value of:

- The reductions
- The financial incentive to keep the reductions in the value chain

# PRODUCERS OF REDUCED TONS OF CO<sub>2</sub>e



# PROTOCOL

The protocol describes the methodology used for quantifying, monitoring, evaluating, verifying and recording GHGs reductions gained with a GHG reduction project.

**It ensures the quality of the reductions reported.**

# BUYERS

Voluntary and Regulated market

## Agri-food processors



## Large emitters



## Other voluntary buyers



# A significant impact

Agriculture can contribute to 10% of GHG reduction targets by 2100 ([Emissions Gap Report 2017](#))

If Quebec dairy farms **increase the organic matter in their soils by 1%:**

**150 tons** of CO<sub>2</sub>e reduced per hectare

for a total of **100 000 000 tons**

or more than **all the GHG emissions of Quebec in 2021**

# Part 4

## Healthy soil



# How to improve food safety using soil carbon sequestration methodology?

- The goal is to improve SOIL HEALTH by significantly increasing organic matter in soils
- Effectively using crop rotation will return a large quantity of carbon to the soil to nourish the biodiversity of microorganisms. Healthy soil will require much less fertilizer, herbicides and pesticides, leading to soil products that are as little exposed to chemicals as possible.

# In conclusion

Agriculture is in a unique position to reduce its emissions AND act as a carbon sink

In the near future, people will be looking for “carbon-neutral” food products. This designation will demonstrate the efforts of our farms to return carbon from the air to the earth, to help depollute the planet and also improve soil health, thus leading to greater food autonomy by reducing or ceasing the use of pesticides and herbicides.