

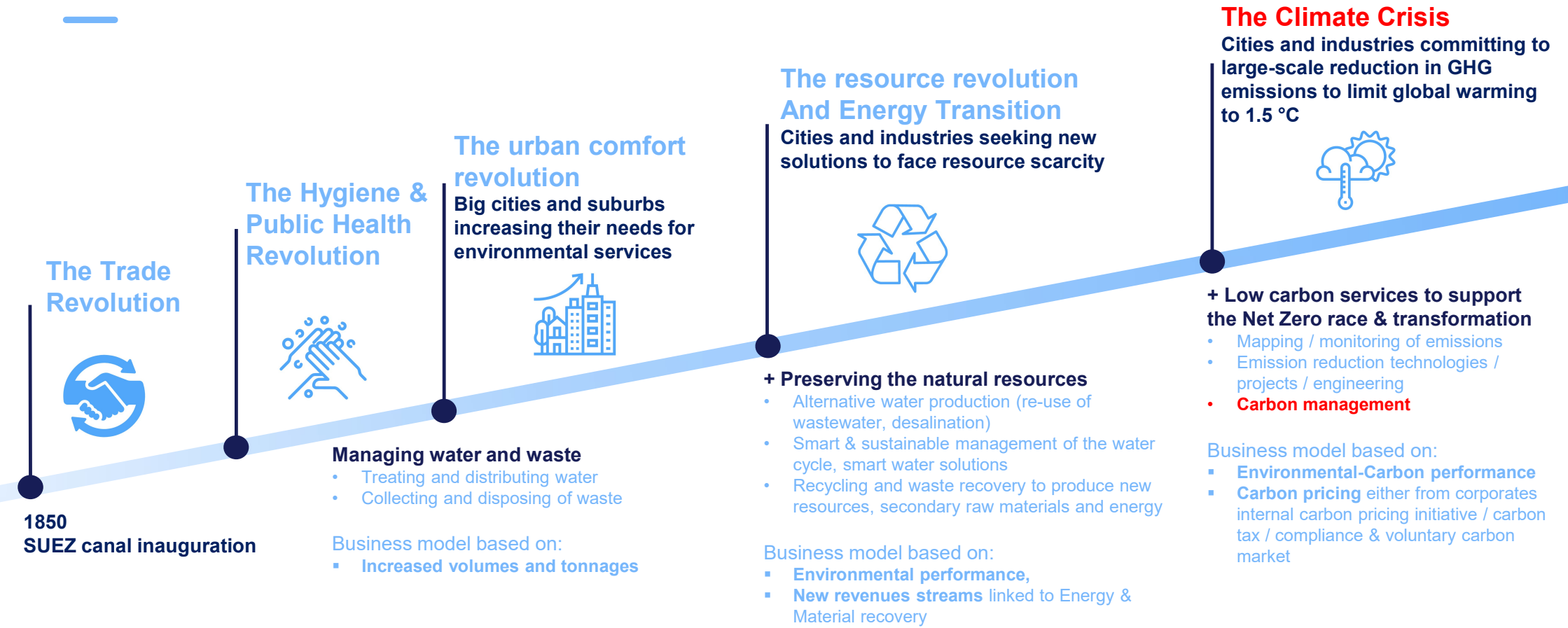
# INTRODUCTION TO CARBON STAKES AND FINANCE

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# Suez always addressed its clients' challenges and adapts its business model

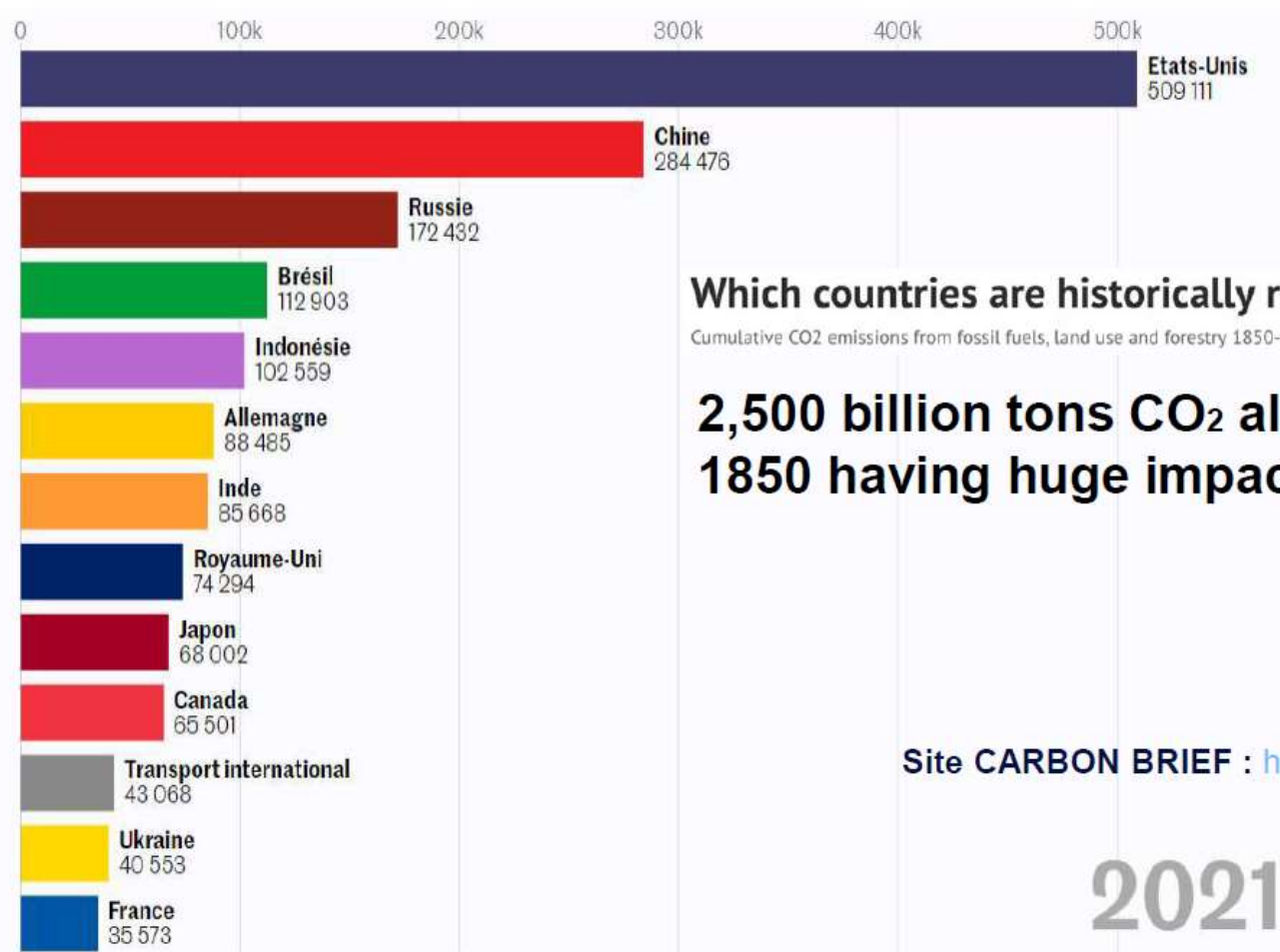


# 1.

## Key figures to understand Climate Change mitigation & associated “carbon management” requirement



# Global picture of historical CO<sub>2</sub> emissions since 1850



**Which countries are historically responsible for climate change?**

Cumulative CO<sub>2</sub> emissions from fossil fuels, land use and forestry 1850-2021 (million tonnes)

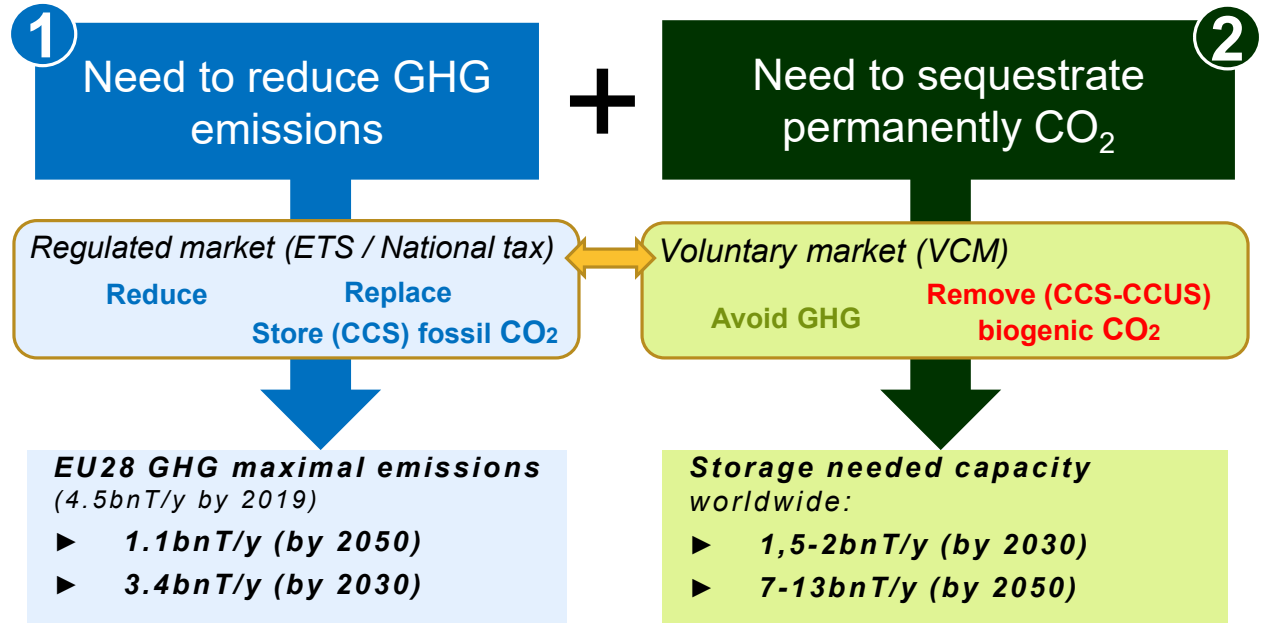
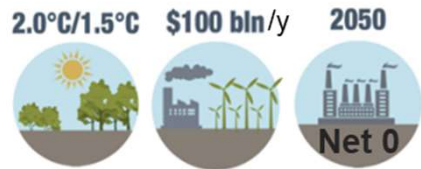
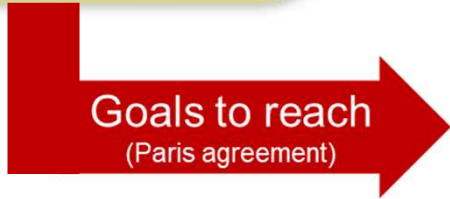
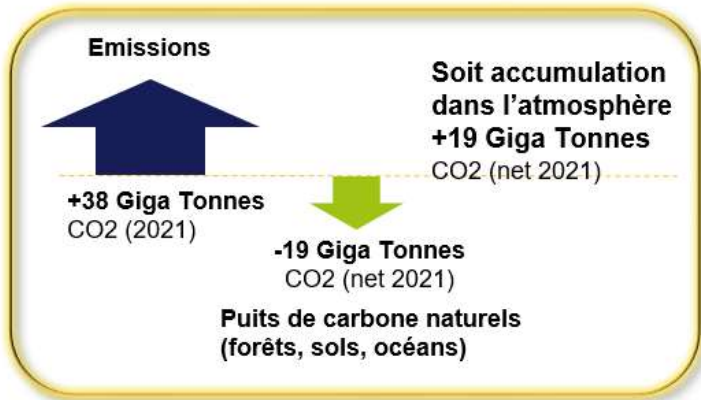
**2,500 billion tons CO<sub>2</sub> already emitted by 2021 since 1850 having huge impacts on our future**

Site CARBON BRIEF : <https://www.youtube.com/watch?v=6zP0L69ieIU>

2021

# Priority to GHG reduction AND need to sequestrate CO<sub>2</sub>

## Bilan annuel CO<sub>2</sub> Monde



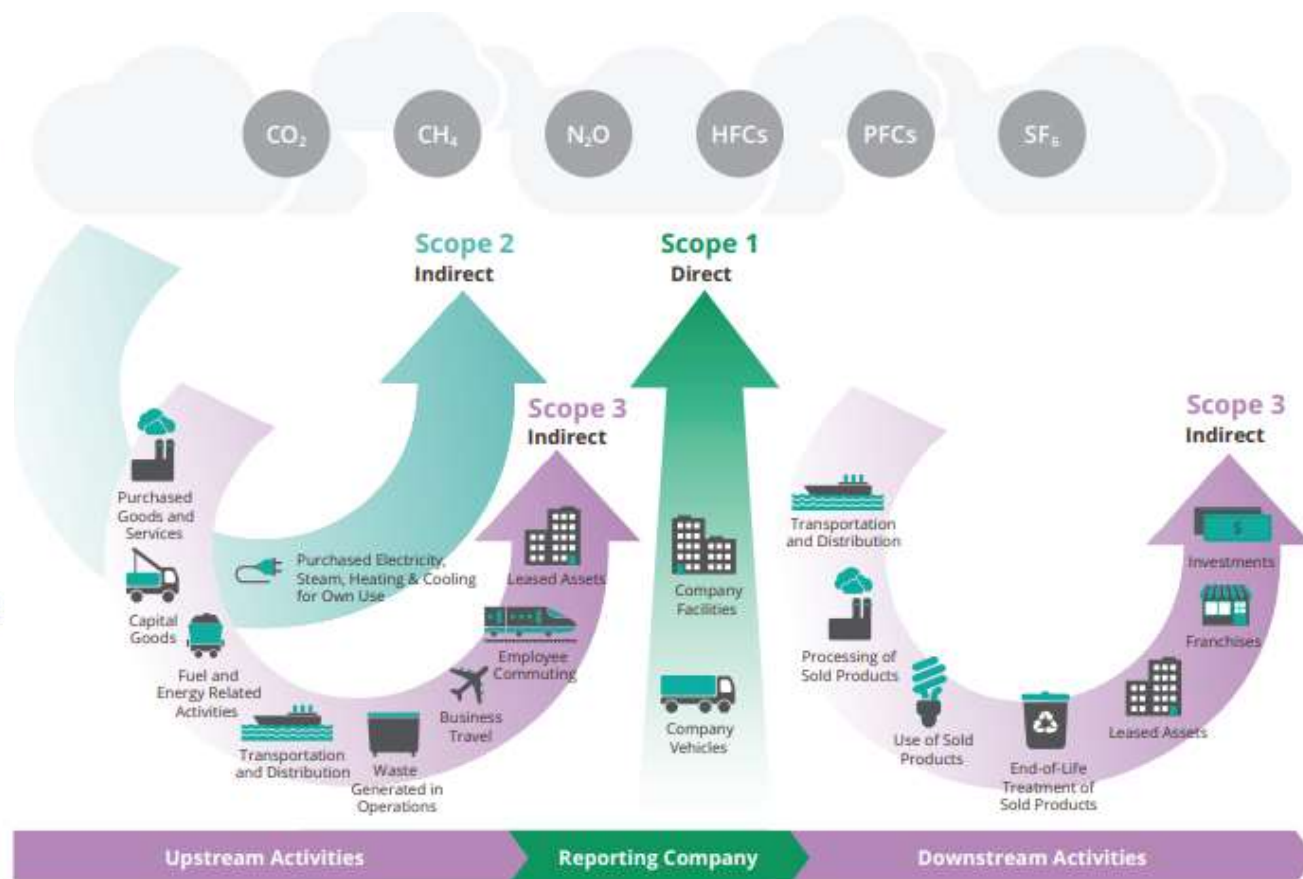


# Definitions regarding GHG emissions (GHG protocol)

**Scope 1: all direct emissions** from the activities of an organization or under their control. Including fuel combustion on site such as gas boilers, fleet vehicles and air-conditioning leaks

**Scope 2: indirect emissions** from electricity purchased and used by the organization. Emissions are created during the production of the energy

**Scope 3: all other indirect emissions** from activities of the organization, occurring from sources that they do not own or control. They are usually the greatest share of the carbon footprint, covering emissions associated with business travel, procurement, waste and water



# Definitions regarding GHG emissions (ADEME)

**Direct and indirect emissions**  
Within my organizational boundaries



Operating power      Equipment and materials

I want to **reduce** emissions **within my organizational boundaries**



Reduced emissions

**Avoided emissions**  
Within another company or project

outside my organizational boundaries as a direct consequence of changes in my activity

I want to help **others** **reduce** their emissions




Avoided emissions

**Carbon removal**

Carbon removed from the atmosphere

I want to help **remove** carbon from the **atmosphere**



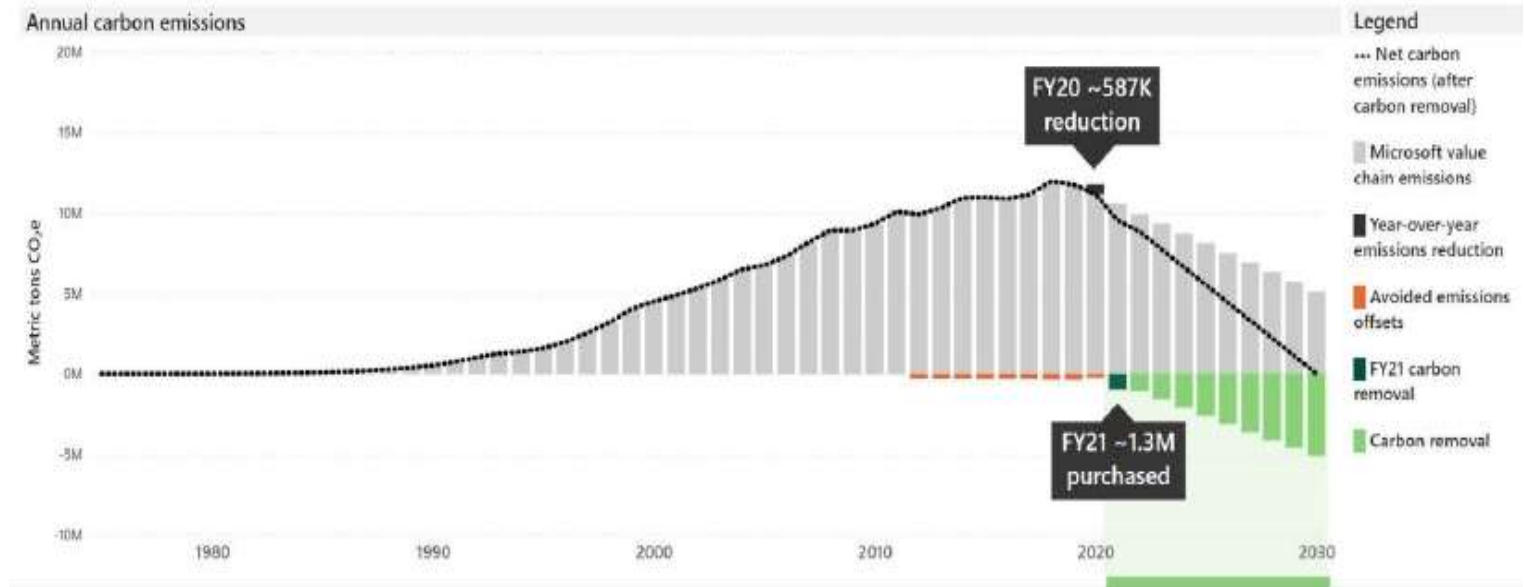
Negative emissions

# Example of a pioneer Corporate



## Microsoft carbon removal Lessons from an early corporate purchase

© 2021 Microsoft. All rights reserved.



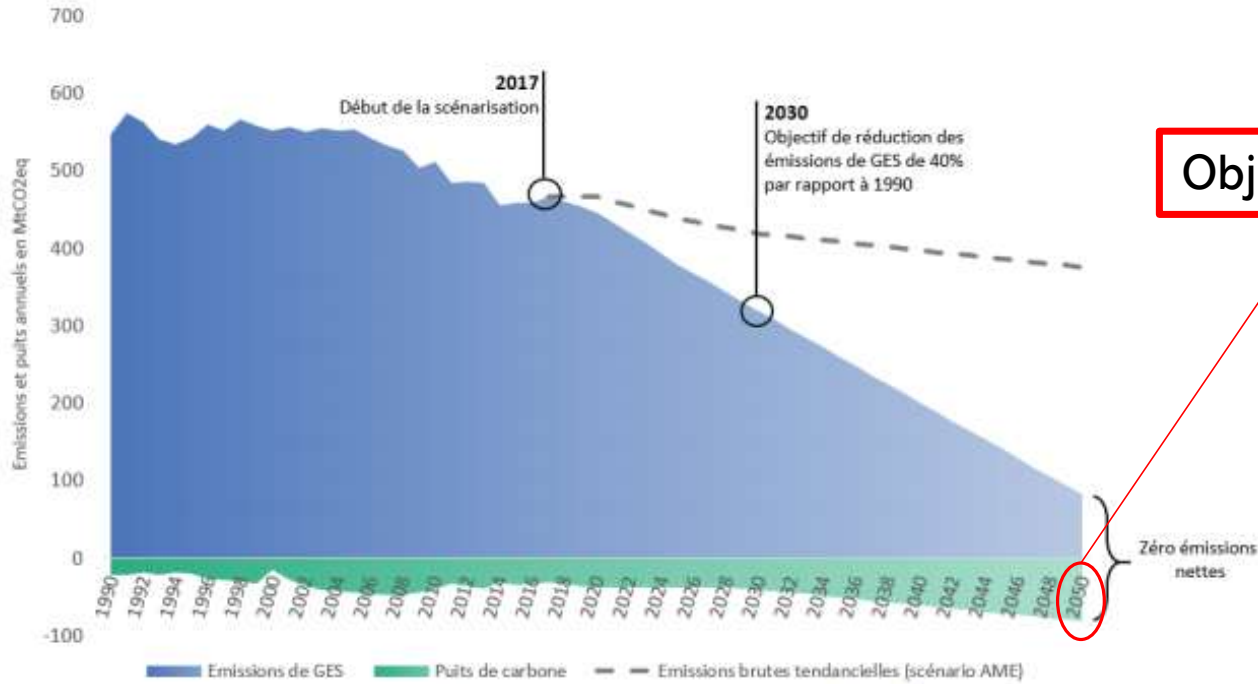
- **Current carbon removal purchase:** 1.3mT (RFP.2021) ; 2.0mT (RFP.2022) ... 5.0mT/y (2030) + 24mT (over 2050) for compensating the carbon debt since its foundation (1975)
- **Solutions profile:** mainly afforestation projects (up to now) ... moving towards more permanent/ durable/ non-reversible solutions



# Example of France (SNBC)



Figure 1 - Evolution des émissions et des puits de GES sur le territoire national entre 2005 et 2050



Obj. sink of ~80mT CO<sub>2</sub>/an (2050)



Stratégie nationale  
Bas carbone

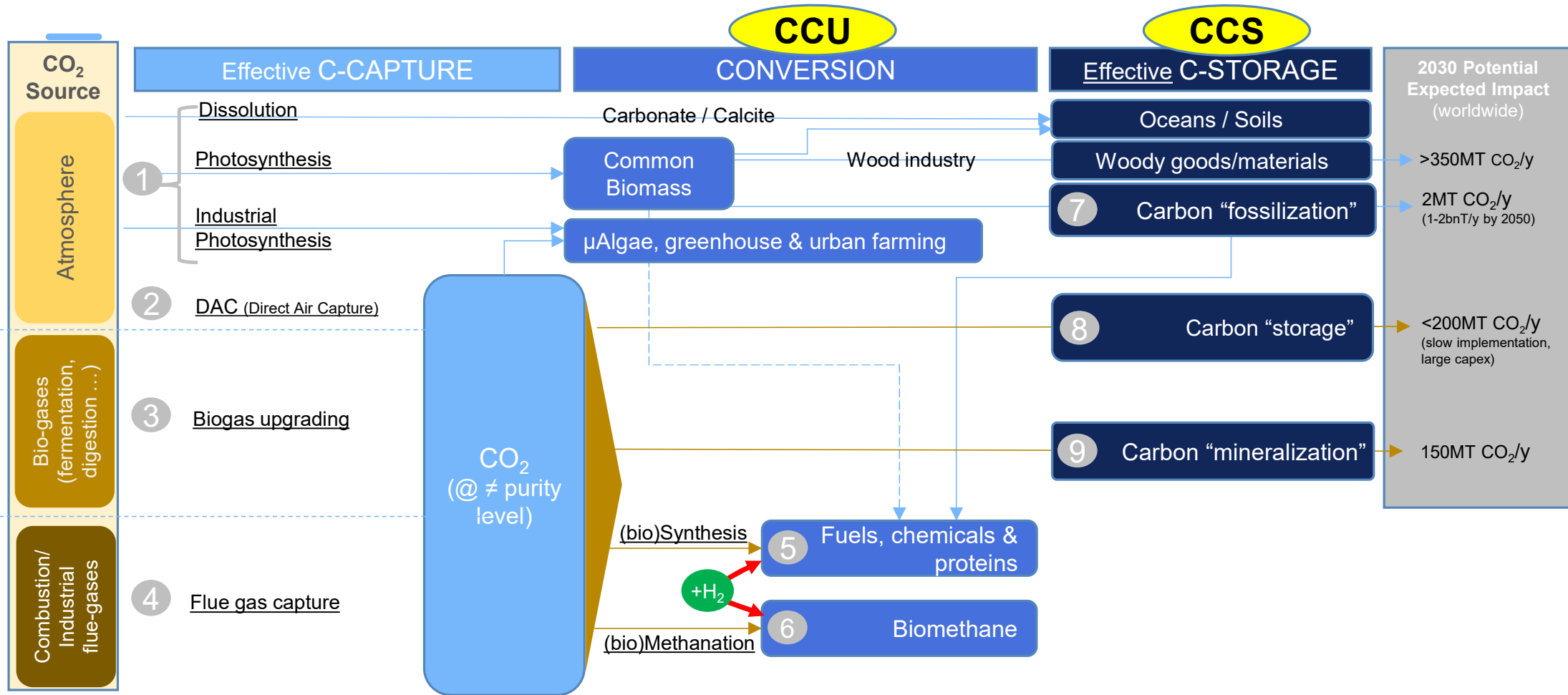


\*Les émissions « tendancielle » sont calculées à l'aide d'un scénario dit « Avec Mesures Existantes » qui prend en compte les politiques déjà mises en places ou actées en 2017.

# 2.

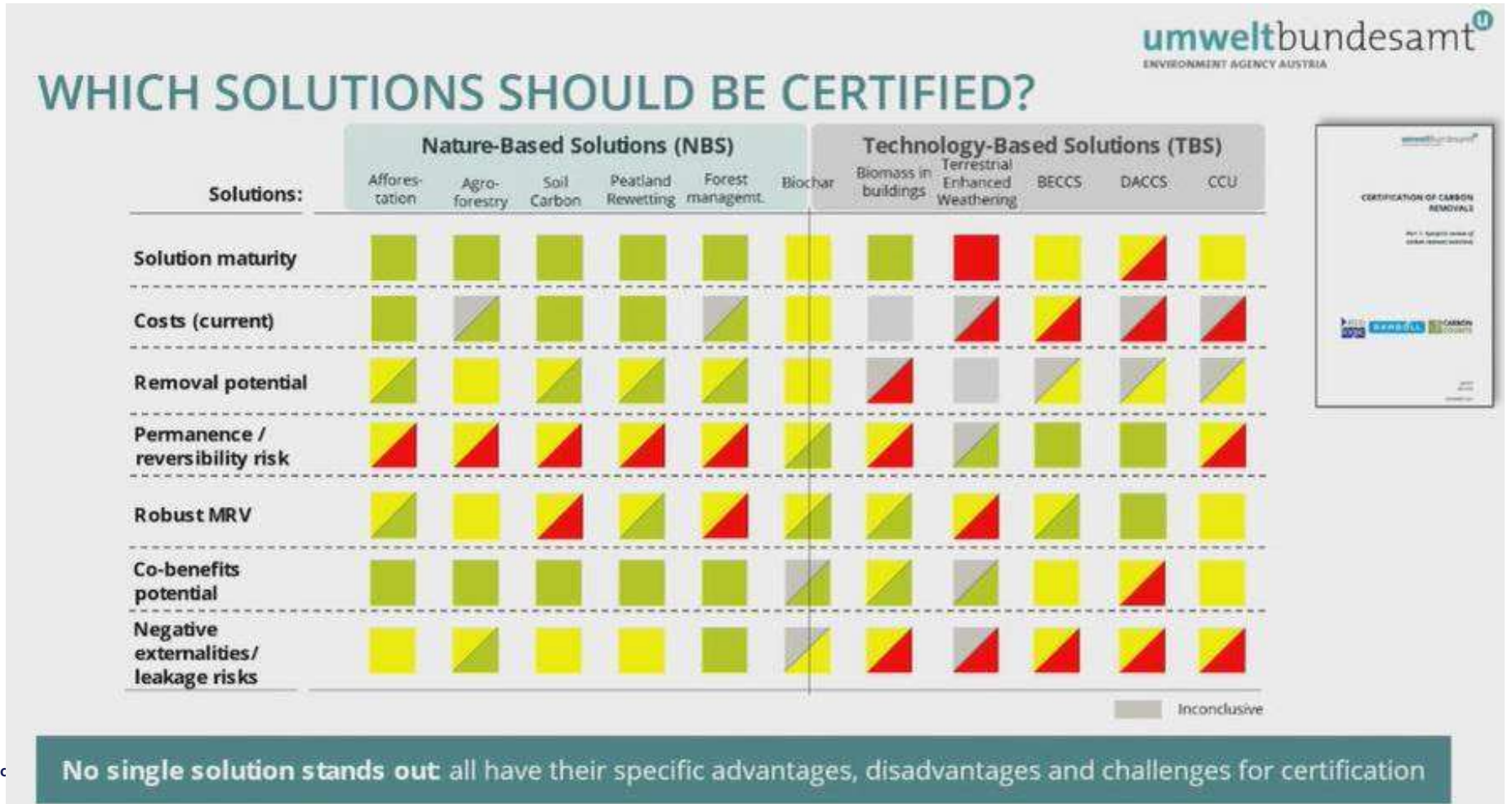
## Global carbon solutions overview

# Mapping of potential carbon solutions



# Mapping of current Carbon Removal solutions

Source published by dec-2021 for the EU commission by UMWELTBUNDESAMT GmbH (Env. Agency Austria) : <https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0795.pdf> (part I)





# 3.

## Introduction to Carbon Markets (ETS & VCM)



# How does it work ?

Today the Carbon Finance landscape worldwide is extremely fragmented and complex but nonetheless offering many opportunities

- 5 potential Carbon Finance Revenue Streams identified to date and not limited to the **Compliance Market** and **Voluntary Market**
- Article 6.2 of the Paris Agreement foresees direct **Cooperative Approaches between countries** by means of **Internationally Transferred Mitigation Outcomes (ITMOs)**
- A growing number of jurisdictions are implementing or planning to implement a **carbon tax or an emission trading system** with a total of **57 initiatives** according to countries' climate pledges.
- Prior Covid-19, the **Carbon Offset and Reduction Scheme for International Aviation (CORSIA)** was considered to be the most likely source of demand in the near term
- So far, voluntary carbon projects had been developed in 83 countries around the world. Subject to the Paris Agreement new provisions, voluntary offset can be traded freely between buyers and sellers across different countries.

Country Level



National & Regional Trading Schemes



Carbon Tax Offsetting



International Aviation

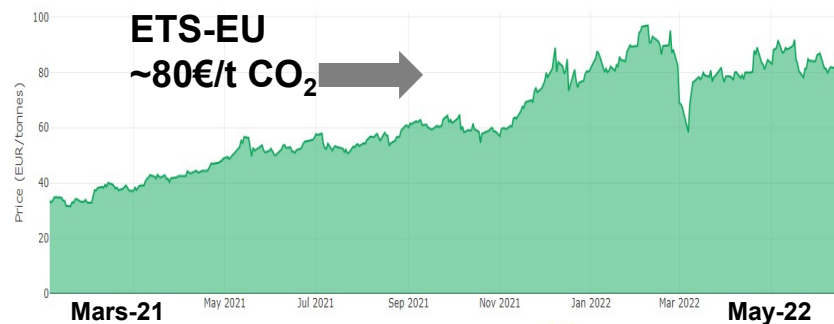


Voluntary Market



# ETS versus Voluntary carbon market

	Compliance market (Emission Trading System)	Voluntary Carbon market
Zone d'influence	EU27 + 20 autres zones dans le monde	International
Type d'action	REDUCTION d'émissions fossile (principalement)	<ul style="list-style-type: none"> <li>• EVITEMENT (ex capture de biogaz sur les décharges en pays non industrialisés)</li> <li>• SEQUESTRATION d'émissions biogénique (forestation, agriculture, biochar, carbonates, DAC+CCS, ...)</li> </ul>
Clients concernés	Les sites industriels soumis à ETS (10000 sites en EU représentant 40% des émissions EU)	Tout acteur (particulier, entreprise, collectivité) souhaitant contribuer à sa neutralité
Volumes ciblés (t CO2)	Réduire de 4,5 à 1,1GT/an (CO2 émis) d'ici 2050 [EU27]	7 à 13GT/an (CO2 séquestré) d'ici 2050 [MONDE]
Prix	Cours entre Offre/Demande de quotas d'émissions (~80€/t pour EU27 Jun-22)	Prix fixé de gré à gré entre acheteur/vendeur (0,3€/t à 1000€/t selon le niveau d'additionnalité et l'attrait de la solution)



# Voluntary Carbon Market (introduction)

## Principles



**Permanent** CO<sub>2</sub> must be avoided sustainably on a long-term (>100-1000 years) through avoidance or sequestration  
**Durable** i.e. non reversible such as forest wildfires



**Measurable** A robust methodology from a recognized standard shall be followed using tangible indicators (in situ instrumentation / laboratory analysis)



**Verified** An independent third-party audit must be regularly performed to ensure the project performance and transparency



**Scalable** Projects must be impactful with an industrial component allowing our solutions to be deployed quickly and on a large scale



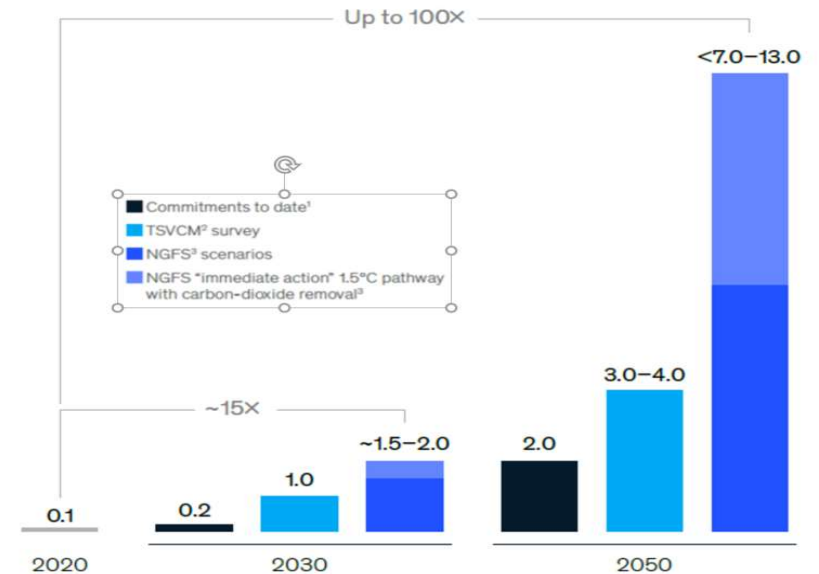
**Additional** Carbon Finance revenues shall contribute to the affordability gap of our clients in emerging countries and the acceleration of breakthrough innovation



**Social and Environmental co-benefits** shall not be limited to climate change but shall address other UN sustainable development goals for the benefit of local stakeholders



Voluntary demand scenarios for carbon credits, gigatons per year



Source: A blueprint for scaling voluntary carbon markets to meet the climate challenge (McKinsey Company)

- Depending on different price scenarios and their underlying drivers, the market size in 2030 could be between \$5 billion and \$30 billion at the low end and more than \$50 billion at the high end
- Based on stated demand for carbon credits, demand projections from experts surveyed, and the volume of negative emissions needed to reduce emissions in line with the 1.5-degree warming goal, McKinsey estimates that annual global demand for carbon credits (~100mt by 2020) could reach up to 1.5 to 2.0 gigatons of carbon dioxide (GtCO<sub>2</sub>) by 2030 and up to 7 to 13 GtCO<sub>2</sub> by 2050
- Biochar is expected by last IPCC report (GIEC) to cover 15-20% of the world carbon removal demand



# 4.

## Conclusion



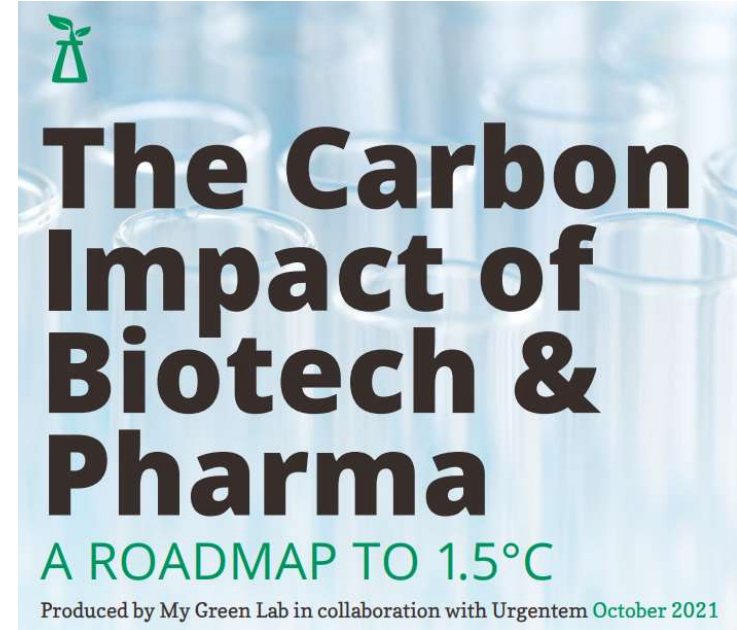
# Risk or Opportunity for Biotech industry ?

## RISKS

- **Significant GHG footprint** from Biotech sector (~200mT/y)
- Some sites are already **targeted in existing ETS register**
- As other industries (steel, chemistry, ...) strong **need to resist against international / outsourcing competition**

## OPPORTUNITIES

- Biotech is key to **capture/turn CO<sub>2</sub> into valuable products**
- Biotech is key for providing **alternatives materials with efficient carbon footprint** especially from the tremendous source of un/mis-used organic residues
- Biotech may address quite easily the **strong “naturality” request** from consumers against the past chemistry offer
- Proving your **“Climate positiveness impact”** will offer **strong financial / investment opportunity** from the market



The global biotechnology and pharmaceutical industry has a significant carbon footprint (197 million tCO<sub>2</sub>-e), nearly half the annual carbon output of the United Kingdom.

Scope 3 emissions are nearly five times larger than scope 1 and 2 emissions, so it is critical to consider the entire value chain when evaluating the carbon footprint of biotech and pharma.