EMPREINTE CARBONE DES INDUSTRIES : LES NOUVELLES RÈGLES DU JEU

Dominique HELAINE
Carbon Solutions Director
SUEZ SES Climate Solutions

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

The Trade Revolution

1850
SUEZ canal inauguration

The Hygiene & Public Health Revolution

Managing water and waste
- Treating and distributing water
- Collecting and disposing of waste

Business model based on:
- **Increased volumes and tonnages**

The urban comfort revolution

Big cities and suburbs increasing their needs for environmental services

The resource revolution And Energy Transition

Cities and industries seeking new solutions to face resource scarcity

+ Preserving the natural resources
- Alternative water production (re-use of wastewater, desalination)
- Smart & sustainable management of the water cycle, smart water solutions
- Recycling and waste recovery to produce new resources, secondary raw materials and energy

Business model based on:
- **Environmental performance,**
- **New revenues streams** linked to Energy & Material recovery

The Climate Crisis

Cities and industries committing to large-scale reduction in GHG emissions to limit global warming to 1.5 °C

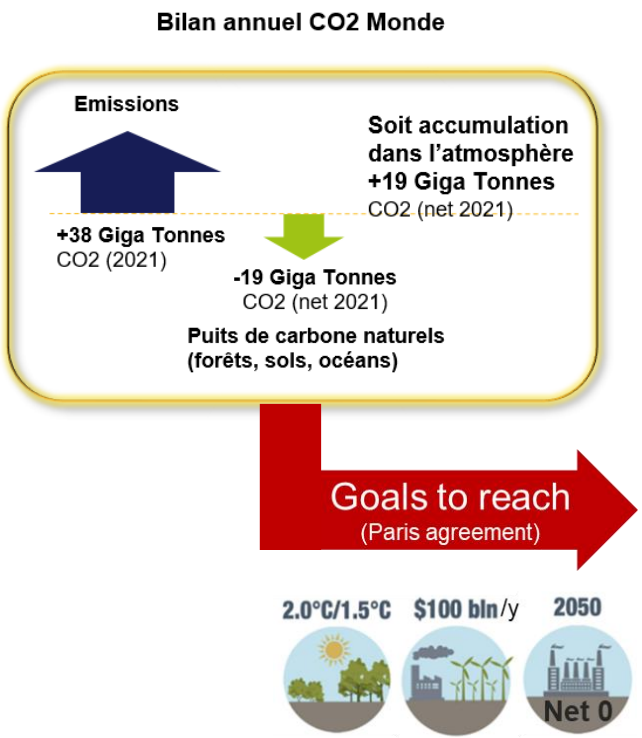
+ Low carbon services to support the Net Zero race & transformation
- Mapping / monitoring of emissions
- Emission reduction technologies / projects / engineering
- **Carbon management**

Business model based on:
- **Environmental-Carbon performance**
- **Carbon pricing** either from corporates internal carbon pricing initiative / carbon tax / compliance & voluntary carbon market

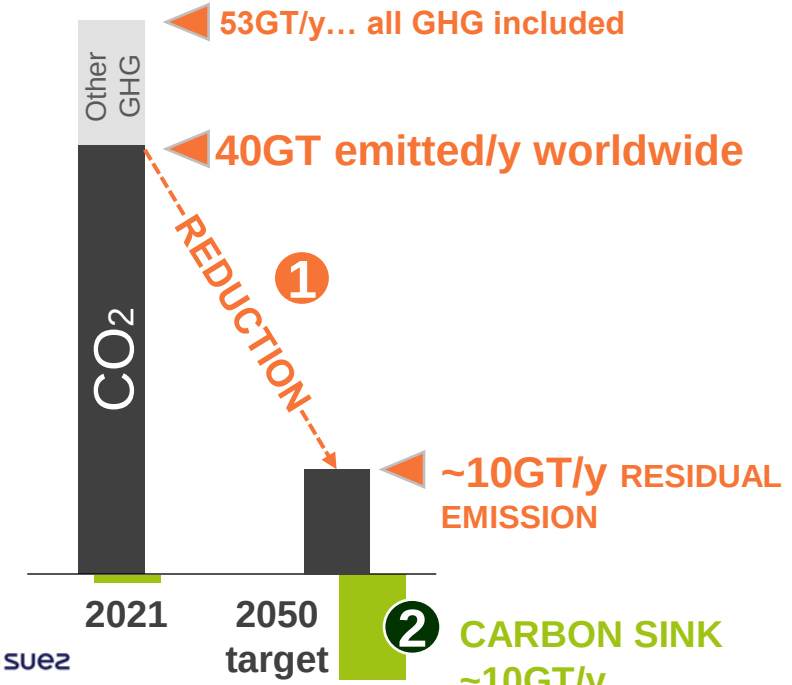
1.

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

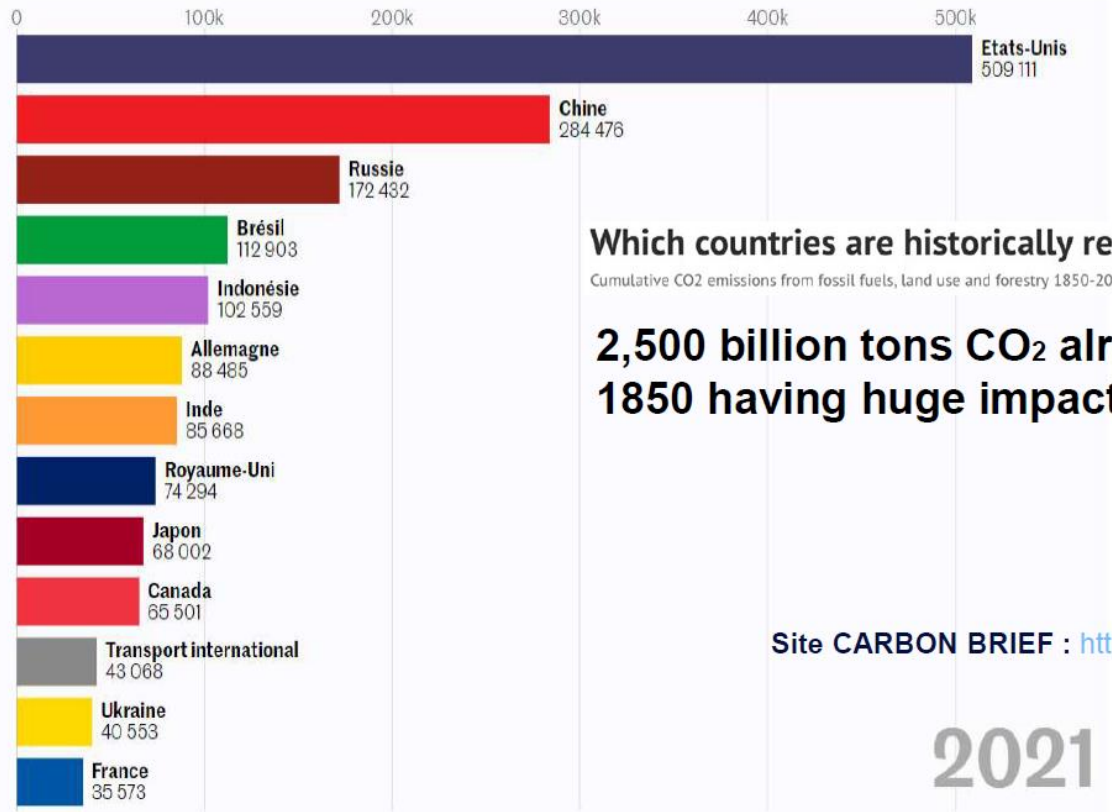
Priority to GHG reduction AND need to sequestrate CO_2



1 Need to reduce GHG emissions + 2 Need to sequestrate permanently CO_2



Global picture of historical CO_2 emissions since 1850

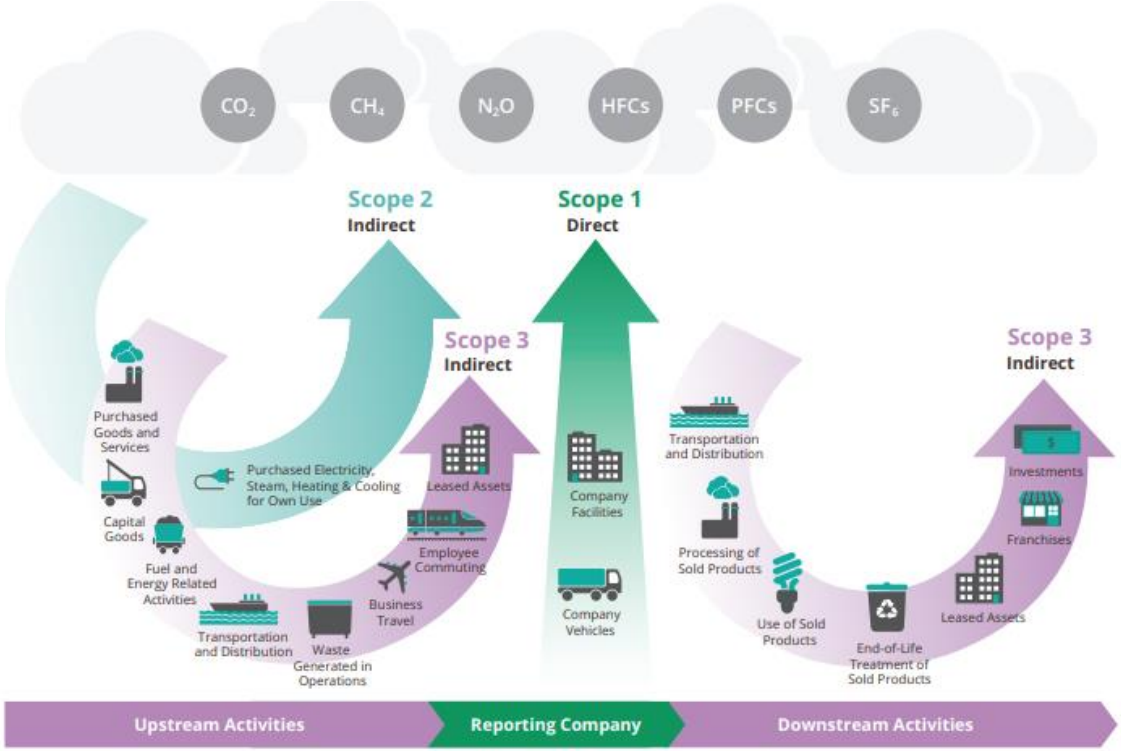


Definitions regarding GHG emissions (GHG protocol)

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**

Avoided emissions
Within another company or project

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

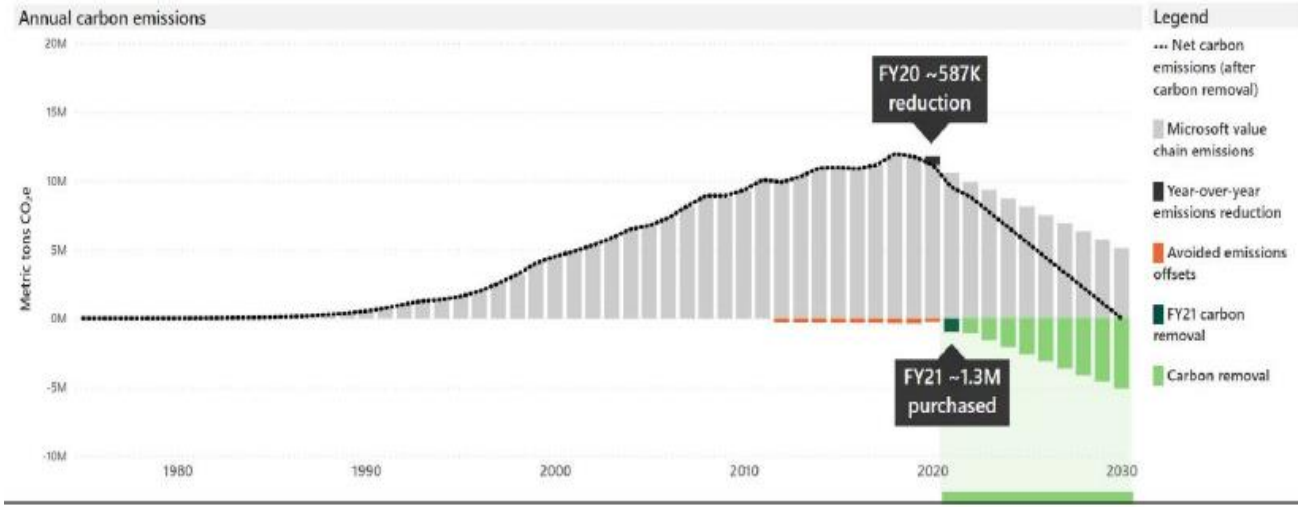
I want to help **others reduce** their emissions

Carbon removal

Carbon removed from the atmosphere

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

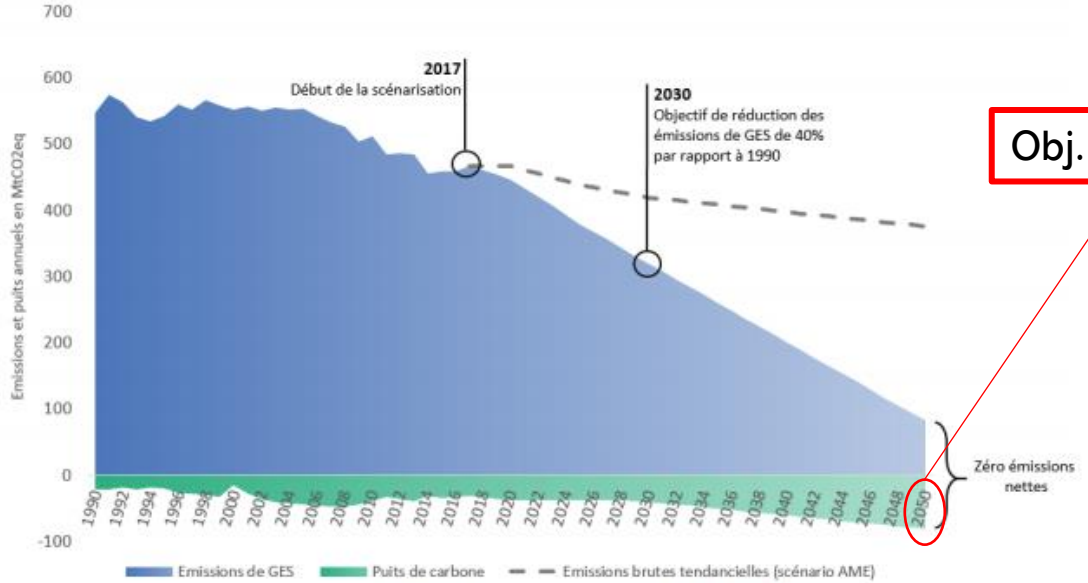
Example of a pioneer Corporate



- **Current carbon removal purchase:** 1.5mT (RFP.2022) … obj. 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/ multi-SDGs solutions

Example of France (SNBC)

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



**Les émissions « tendancielles » 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.*

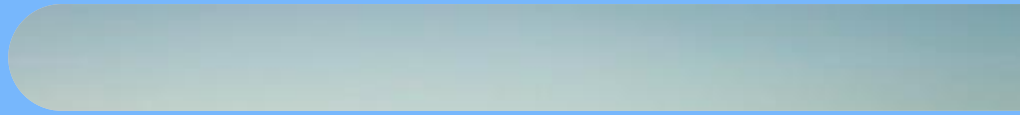
Obj. sink of ~80mT CO_2/an (2050)

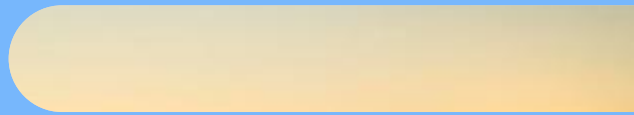
Stratégie nationale Bas carbone

PARIS2015
CONFÉRENCE DES NATIONS UNIES SUR LES CHANGEMENTS CLIMATIQUES
COP21·CMP11

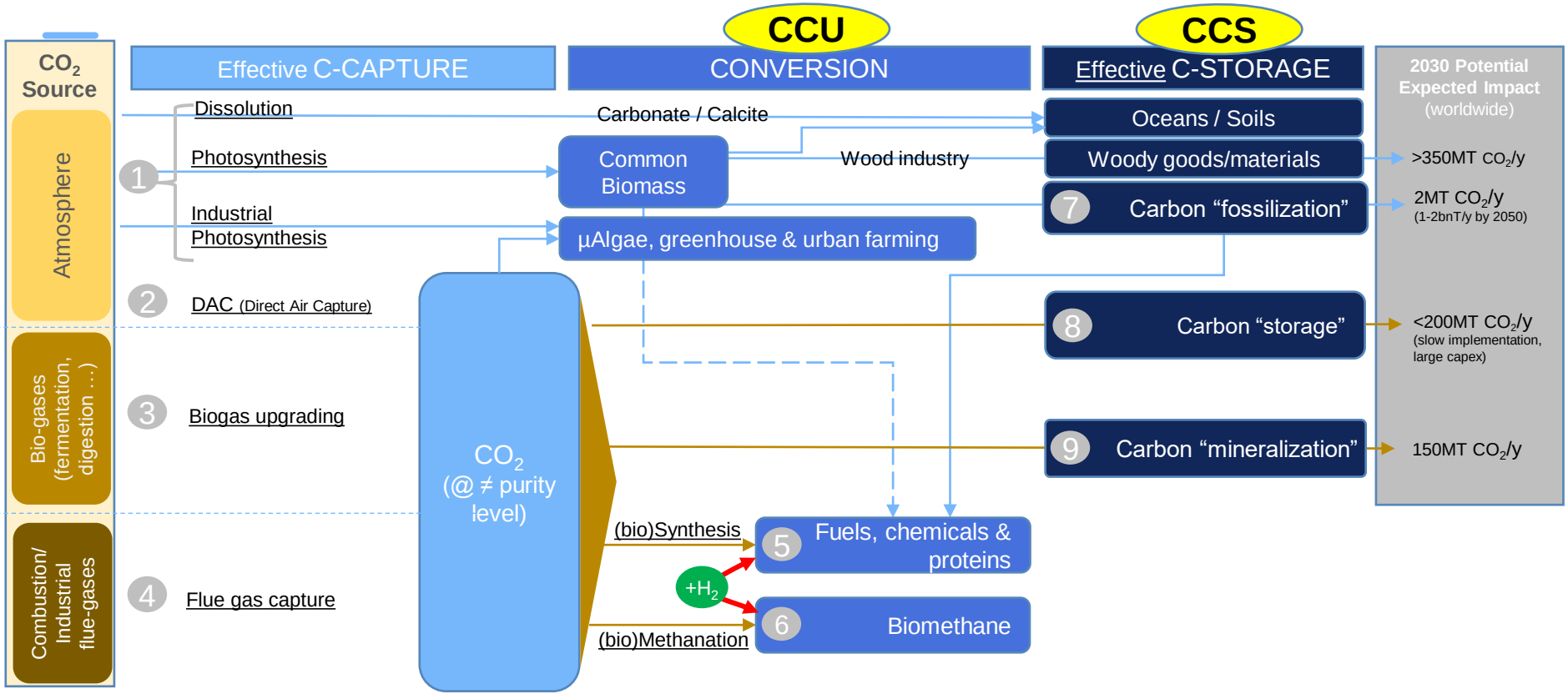
2.

Global carbon solutions overview





Mapping of potential carbon solutions

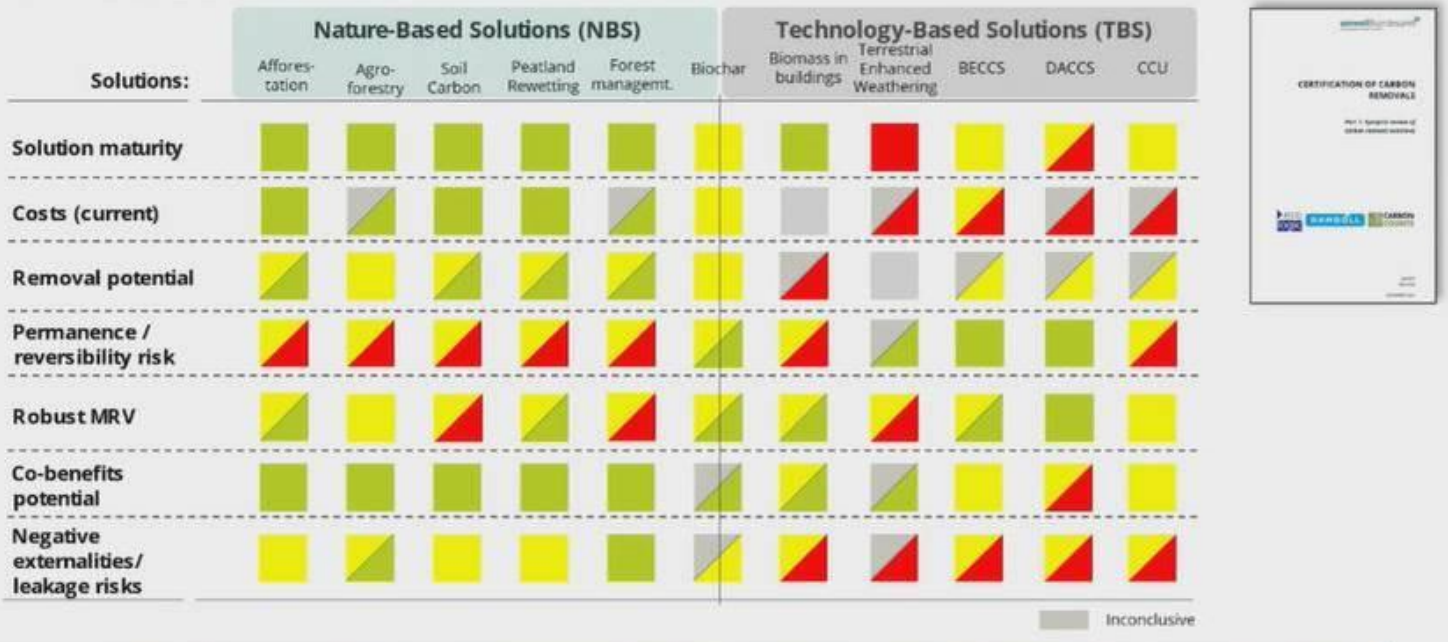


Mapping of current Carbon Removal solutions

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

umweltbundesamt
ENVIRONMENT AGENCY AUSTRIA

WHICH SOLUTIONS SHOULD BE CERTIFIED?



No single solution stands out all have their specific advantages, disadvantages and challenges for certification

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 may 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 foresee 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

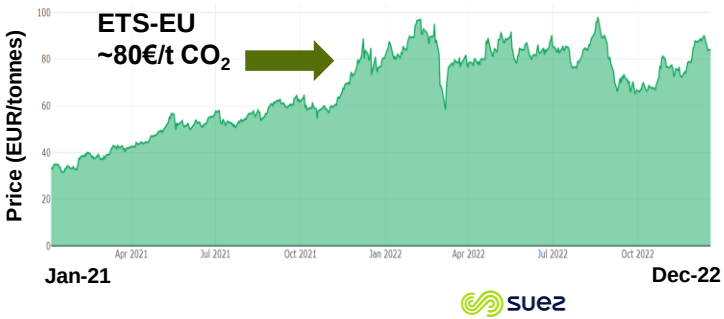
Carbon Tax Offsetting

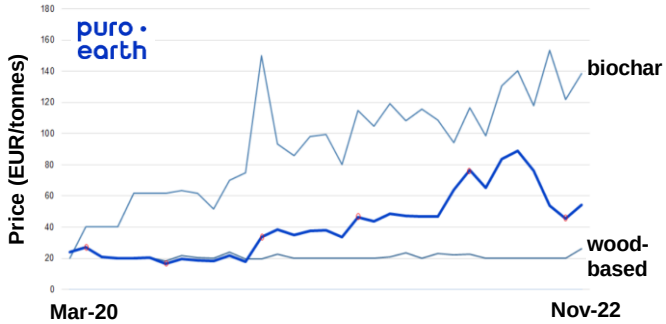
International Aviation

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 (par réduction ou substitution)	• EVITEMENT (ex capture de biogaz sur les décharges en pays non industrialisés) • SEQUESTRATION d'émissions biogénique (forestation, agriculture, biochar, carbonates, DAC+CCS, …)
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 Dec-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_2 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)

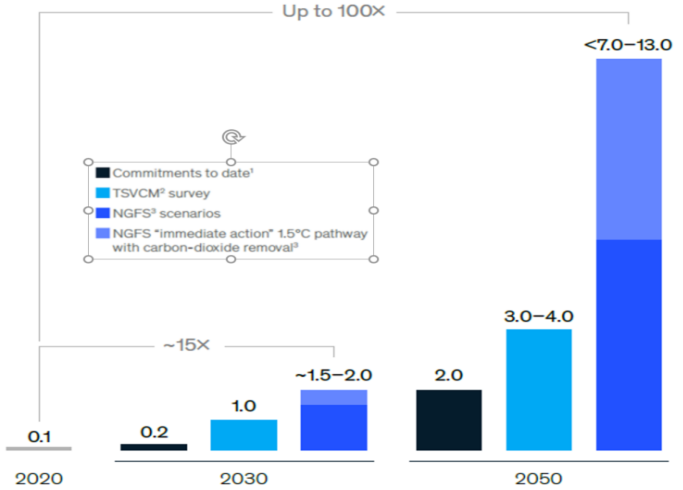
Verified An independent third-party audit must be regularly performed to ensure the project performance and transparency

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_2$) by 2030 and up to 7 to 13 $GtCO_2$ by 2050*
- *Biochar is expected by last IPCC report (GIEC) to cover 15-20% of the world carbon removal demand*

4.
Conclusion

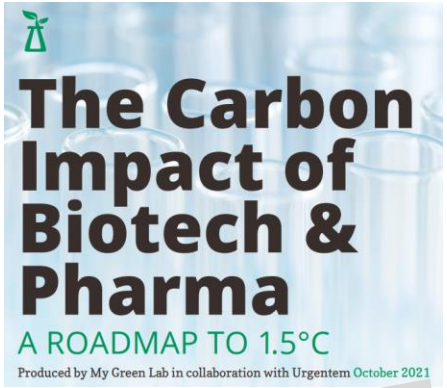
Risk or Opportunity for Biotech industry ?

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_2 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 biotech and pharma industry has a significant carbon footprint** (197 mt $CO_{2\,eq.}$) nearly half the annual carbon output of the UK

Scope 3 emissions are nearly 5 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

A recent study on the carbon impact of the pharmaceutical and biotechnology industry found that more companies than ever are adopting zero carbon goals and showing their commitment to **halve emissions by 2030** and **join the Race to Zero**