

INTRODUCTION TO CARBON STAKES AND FINANCE

Jan.2022

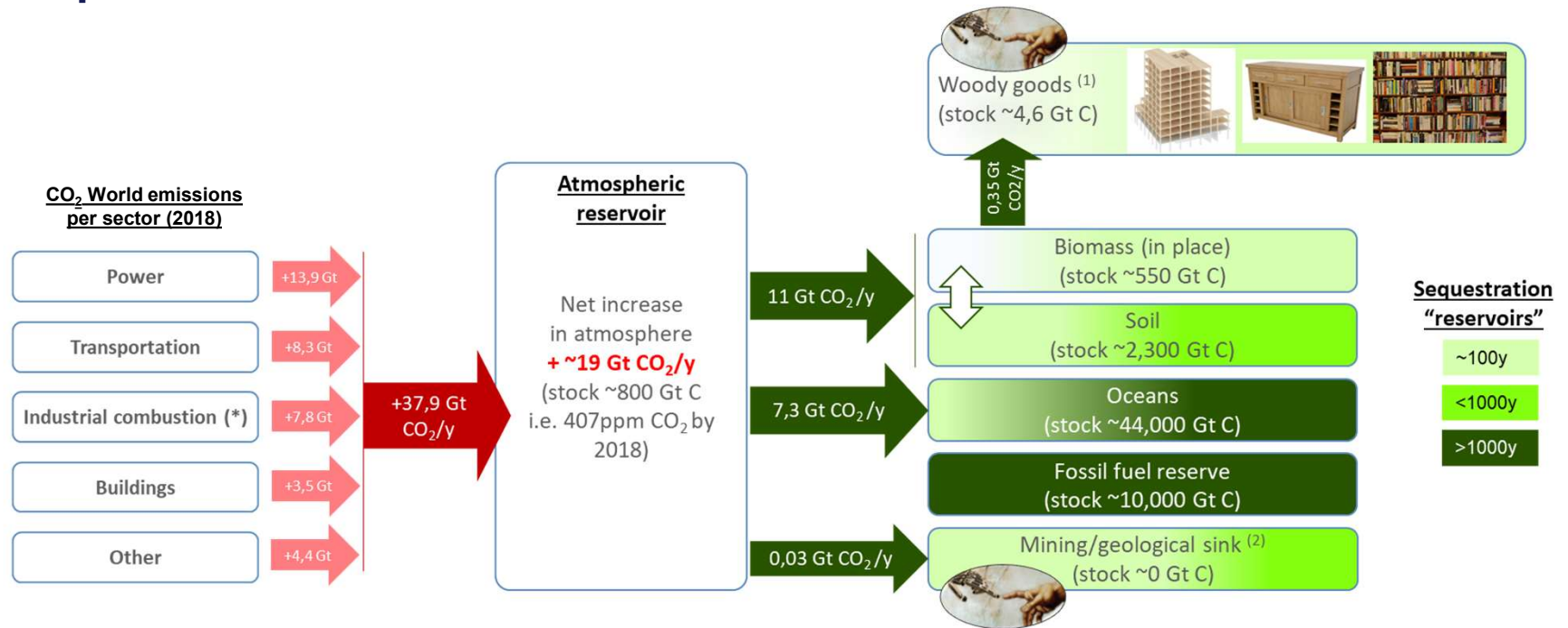


1.

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



Global picture of CO₂ emissions vs removal

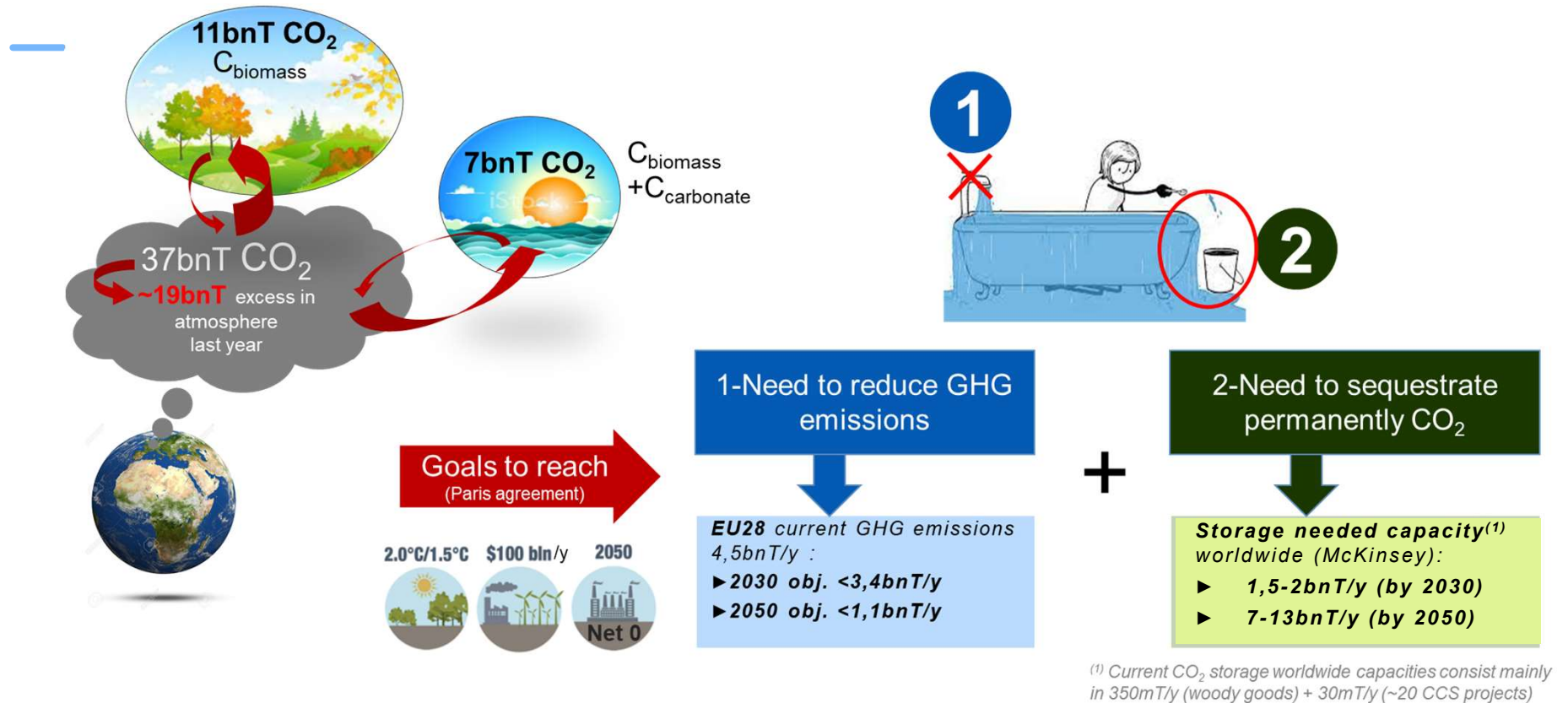


(*) including industrial manufacturing and fuel production

(1) Such as paper/wood furniture, wood construction, infrastructure - Source : Global mitigation potential of carbon stored in harvested wood products, Craig M. T. Johnston and Volker C. Radeloff, 03/2019

(2) According to the last CCS 2020 Report : 65 commercial O&G CCS units are operational or under development out of which 26 operating, 3 under construction, 34 under development and 2 suspended. Current capacity is almost 40Mta CO₂ captured (stored ?) out of a total capture capacity estimated of around 115 Mta for the whole project portfolio

Need to reduce AND need to sequestrate CO₂

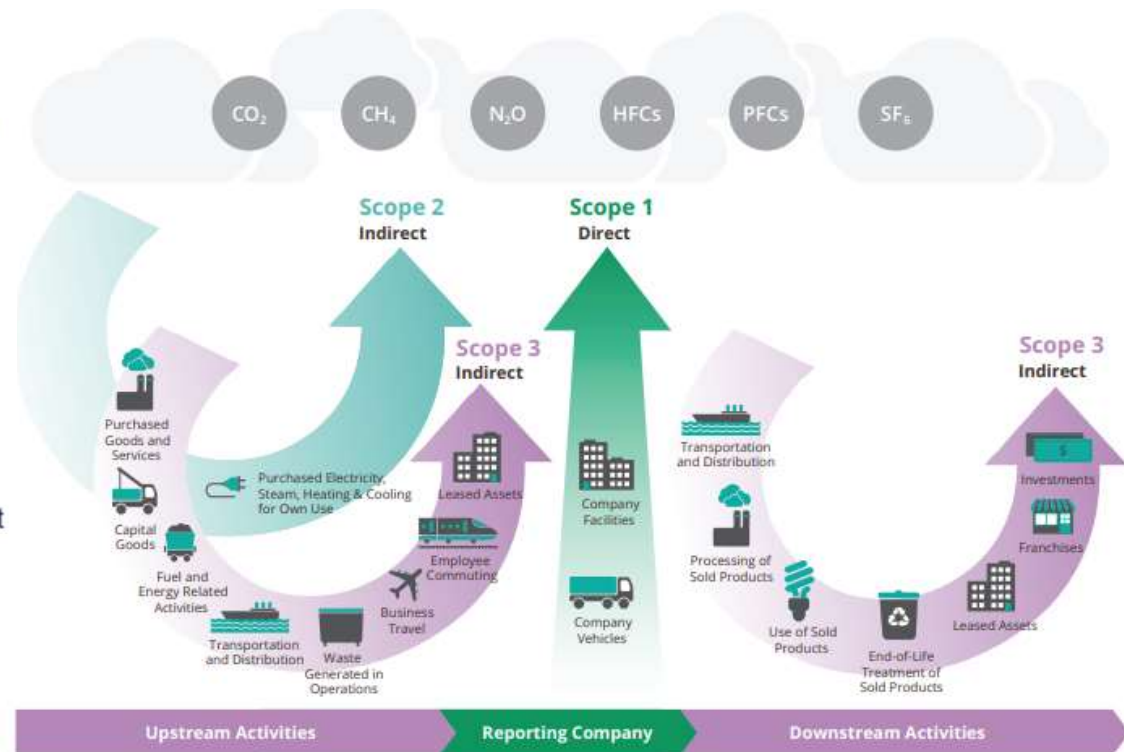


Definitions regarding GHG emissions (GHG protocol)

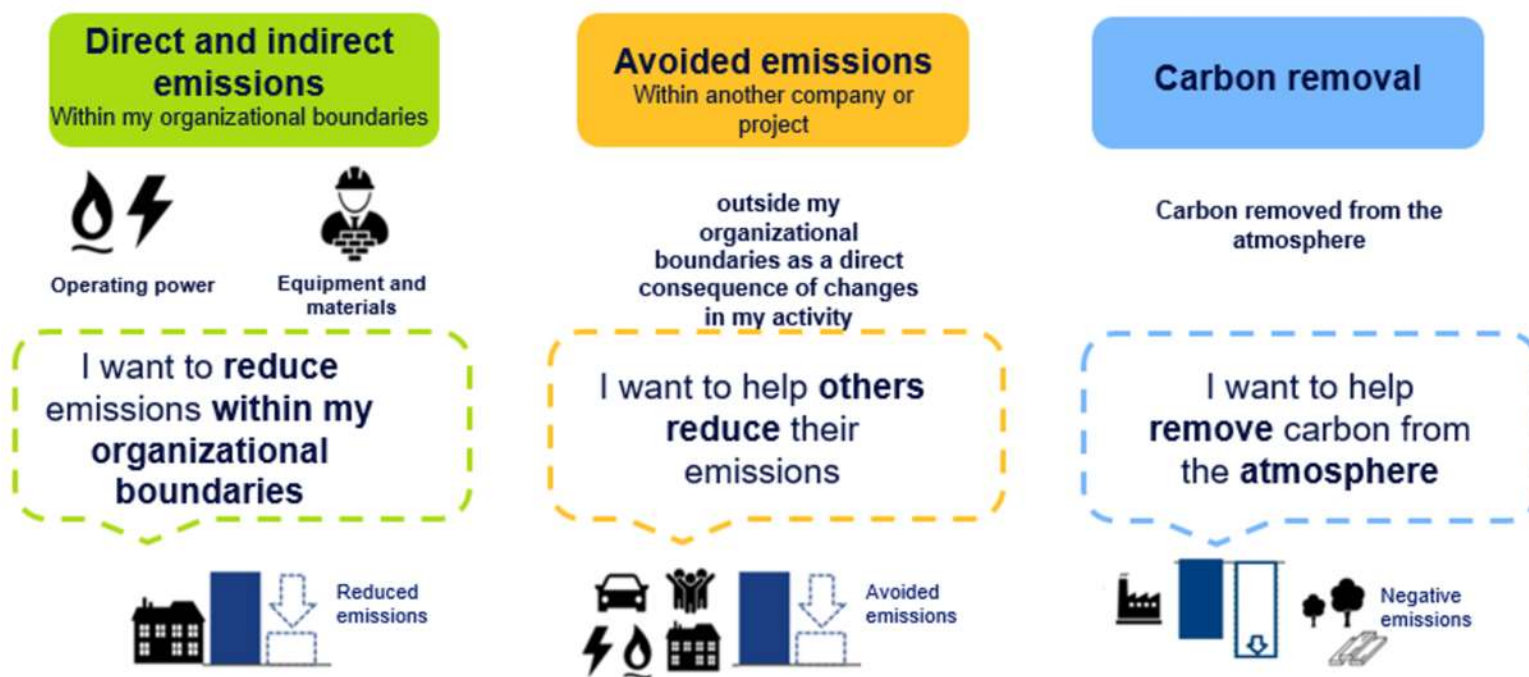
Scope 1: all direct emissions from the activities of an organization or under their control. Including fuel combustion on site such as gas boilers, fleet vehicles and air-conditioning leaks

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

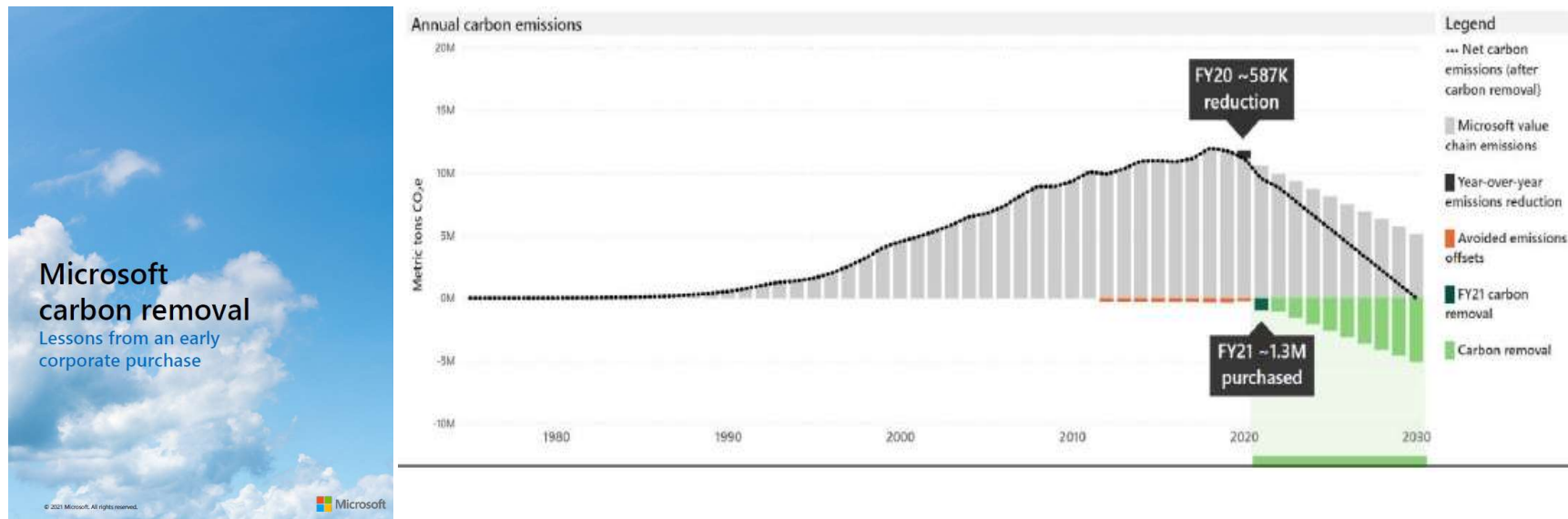
Scope 3: all other indirect emissions from activities of the organization, occurring from sources that they do not own or control. They are usually the greatest share of the carbon footprint, covering emissions associated with business travel, procurement, waste and water



Definitions regarding GHG emissions (ADEME)



Example of a pioneer Corporate

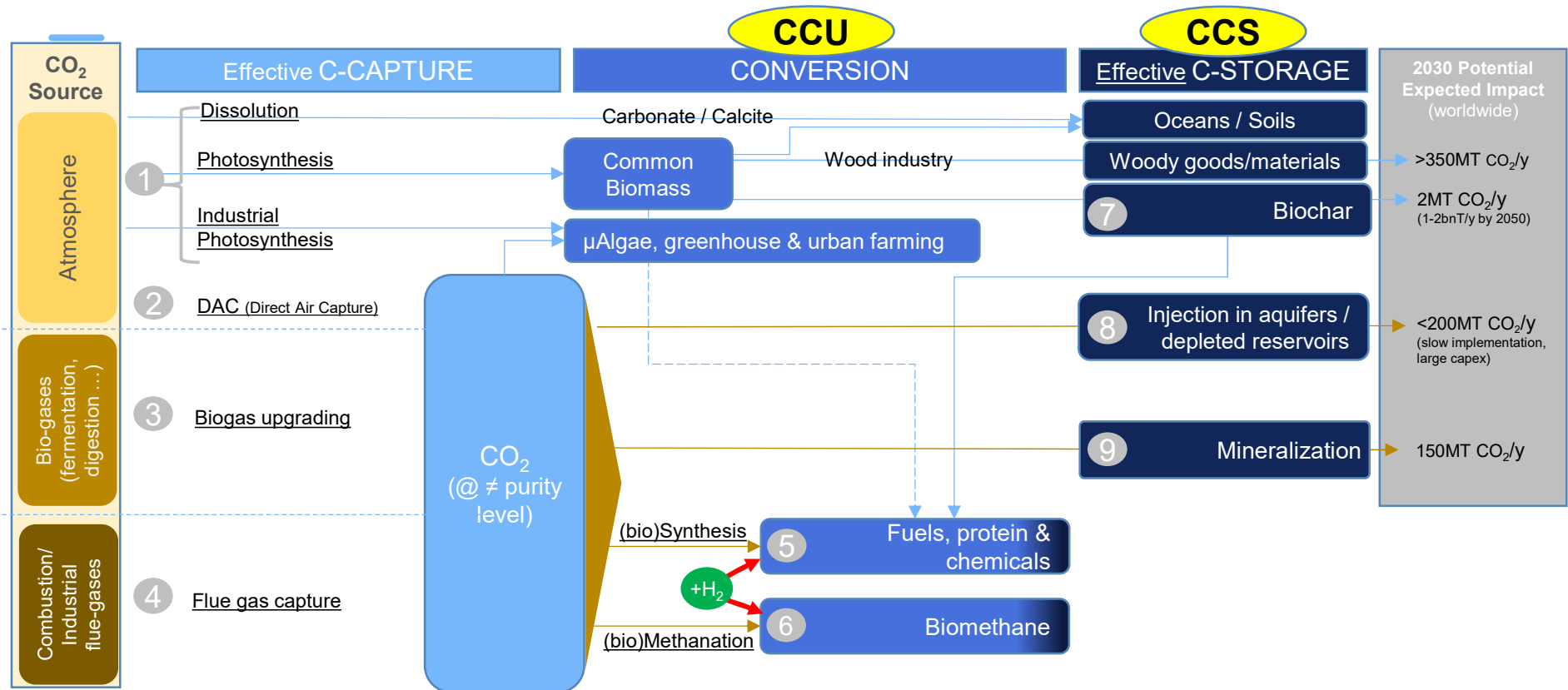


- **Current carbon removal purchase:** 1.3mT (RFP.2021) ; 2.0mT (RFP.2022) ... 6.0mT/y (2030) + 24mT (over 2050) for compensating the carbon debt since its foundation (1975)
- **Solutions profile:** mainly afforestation projects (up to now) ... moving towards more permanent/ durable/ non-reversible solutions

2.

Global carbon solutions overview

Mapping of potential carbon solutions



3.

Introduction to Carbon Markets (ETS & VCM)



How does it work ?

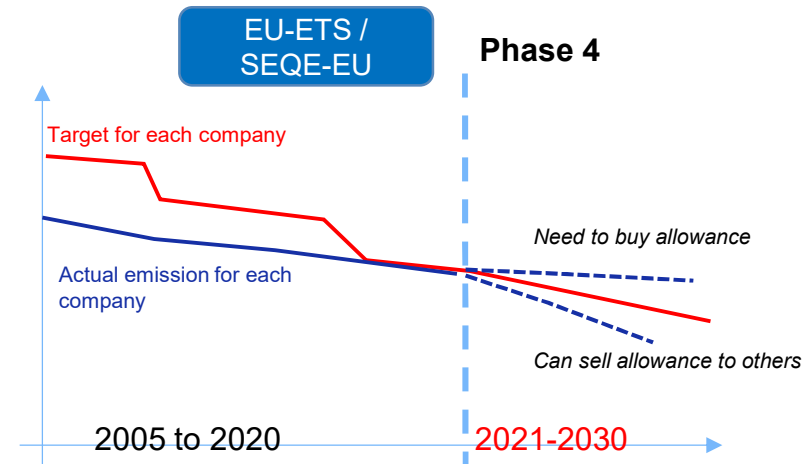
Today the Carbon Finance landscape worldwide is extremely fragmented and complex but nonetheless offering many opportunities

- 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.



Compliance Market (ETS introduction)

- ❑ 21 ETS in operation in the world
- ❑ EU enters in its Phase 4 (2021/2030)
- ❑ Listed companies/sites receive allowances (right to emit 1 ton of CO₂ eq.). If it exceeds:
 1. Need to reduce
 2. Buy allowances to others
 3. Buy international or voluntary credits to offset (not in all ETS)
- ❑ Penalties applied in case of non-compliance



Voluntary Carbon Market (introduction)

Principles



Permanent CO₂ 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

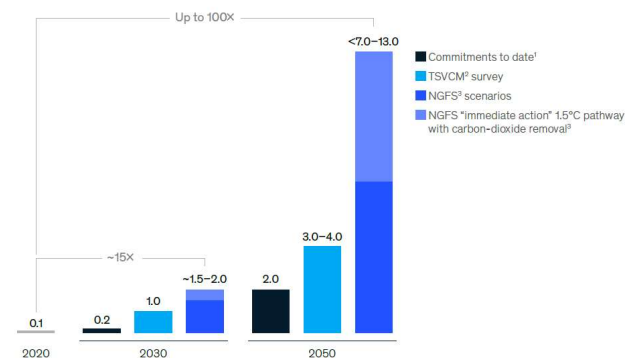


A blueprint for scaling voluntary carbon markets to meet the climate challenge

McKinsey & Company

- For more and more companies, it will be **necessary to use carbon credits to offset emissions** they can't get rid of by other means
- Current purchase on VCM is around **100mt (2020)** with a price from 0,5 to 750 USD/ton sequestered CO₂
- 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 (GtCO₂) by 2030 and up to 7 to 13 GtCO₂ by 2050**. 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
- Solutions would come from **4 categories**: avoided nature loss (including deforestation); nature-based sequestration, such as reforestation; avoidance or reduction of emissions such **as methane from landfills**; and **technology-based removal of carbon dioxide from the atmosphere such as biochar**

Voluntary demand scenarios for carbon credits, gigatons per year



4.

Conclusion

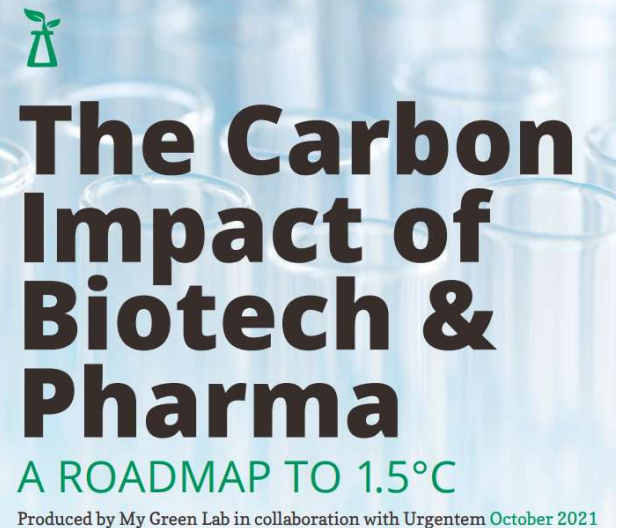
Risk or Opportunity for Biotech industry ?

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 CO₂ 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 “naturalness” request** from consumers against the past chemistry offer
- Proving your **“Climate positiveness impact”** will offer **strong financial / investment opportunity** from the market



While the largest companies by revenue are reducing carbon emissions year on year, the biotech and pharma industry is not yet aligned with a 1.5-degree world. The industry must set more ambitious targets, and those commitments must be backed up by measurable action.

The global biotechnology and pharmaceutical industry has a significant carbon footprint (197 million tCO₂-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.