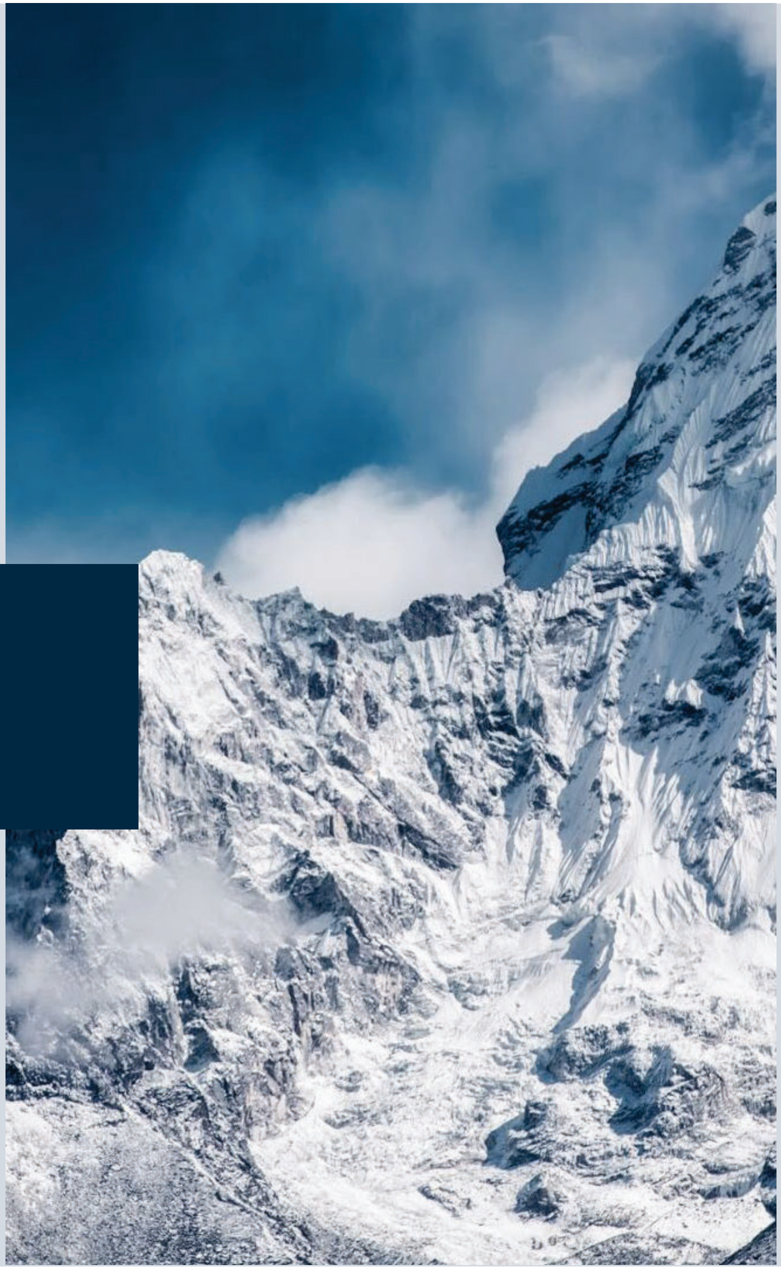


The potential of the Paris Agreement Crediting Mechanism to mobilise carbon removals

Stephan Hoch

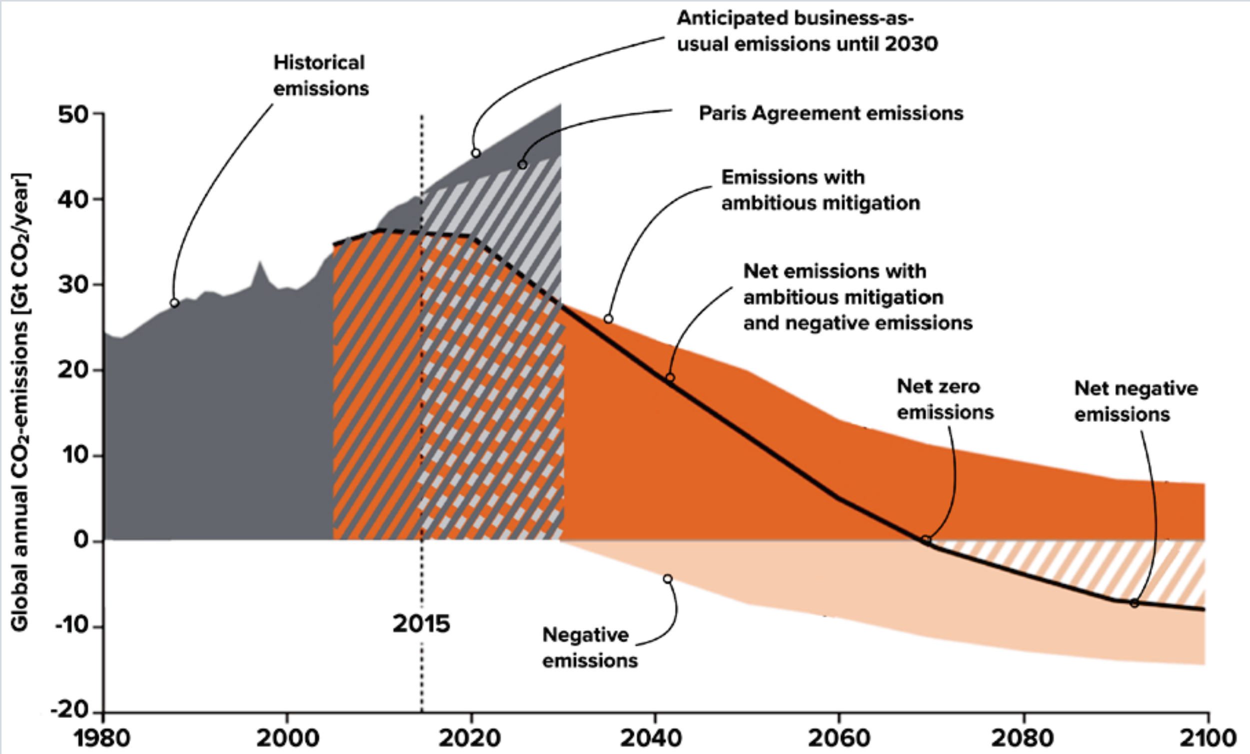
Managing Director, Perspectives Climate Research

Side Event "How carbon markets can unlock high-quality carbon removals"

UNFCCC SB 62

Tuesday, 17.06.2025

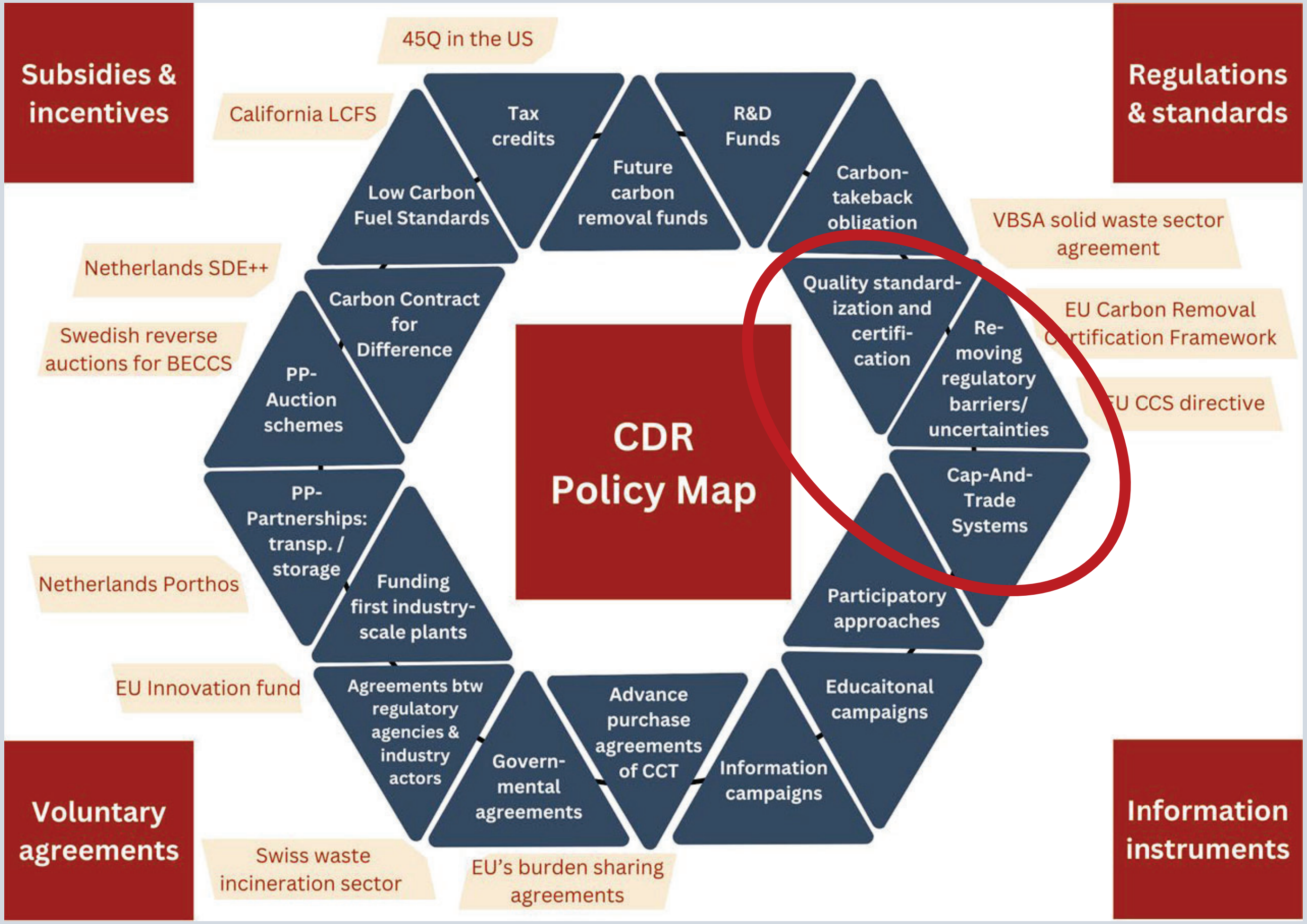
The need for negative emissions



Source: Honegger et al., 2018

Can carbon markets help incentivize carbon dioxide removals?

Carbon markets are one instrument in a much larger toolbox to mobilise removals



Source: CDR PoET, 2025

Removals in UNFCCC carbon markets

Tiny role of CDR in the Clean Development Mechanism

- **Only afforestation and reforestation** activities eligible
- **Reversal risk** was addressed by **temporary credits**
  - Theoretically good solution, unattractive to buyers – <1% of all CDM credits
- **Robust rules for geological storage** (CCS) came late and were never applied in practice due to the CER price crash after 2012 and general lack of CCS progress

Article 6.4/PACM

- Removals guidance agreed at COP29 in late 2024 after three years of negotiations
- **Buffer pool** % contribution depends on the rating of the reversal risk assessment
- **Reversal** – equivalent amount of Buffer A6.4ERs cancelled – differentiation between **avoidable** (within control of developers – must reimburse buffer pool) and **unavoidable** reversals (not required to reimburse pool)
- Activity participants are asked (“should”) to obtain and maintain sufficient **insurance coverage** or comparable guarantee products to cover the risk that avoidable reversals occur – but the wording suggests this may not be mandatory

State of CDR in carbon markets

<u>Article 6.2</u>

- **Few sovereign buyers currently purchase CDR credits** due to concerns about permanence or high costs
- **Removals are a <u>small, yet high-price</u> niche in voluntary carbon markets**
- Currently, the market is in a **pre-financing phase**, i.e. corporates are buying future CO_2 removals.
- 137 CDR providers (e.g. Stockholm Exergi, Ørsted, 1PointFive)
  - However, only 30 providers making regular sales
- Only 15 buyers purchased >100,000 tonnes, Microsoft, Frontier, Google the largest buyers
- Purchased volumes: 8 $MtCO_2$ BECCS (63%), DACCS (20%), Biochar (7%)
- Actually delivered volumes: 319 $KtCO_2$ (Biochar (86%)
- ⌀ Prices: 320 USD/tCO_2
  - BECCS 227 USD/tCO_2, DACCS 316 USD/tCO_2, Biochar 165 USD/tCO_2
- **Lack of regulatory oversight:** Some small crediting programmes with conflicts of interest (both issuing and trading credits)

Robust methodologies are crucial for high-integrity CDR

Technical removals: Early stage, but recent progress on developing baseline and monitoring methodologies

- Puro.Earth with largest issuance, but initially insufficient number of methodologies (e.g. Biochar, Geologically stored carbon, Carbonated materials)
- Isometric's >10 methodologies developed in <2 years, incl. e.g. Biogenic CCS, ERW, DAC, Ocean alkalinity enhancement
- CCS+ Initiative with modular approaches to most CCS-based CDR methods through Verra's VCS

Nature-based removals: Limited experience with CDM, but comprehensive range of methodologies across major VCM crediting programmes

PACM should consolidate and strengthen experience generated in VCM, to emerge as high-integrity benchmark for CDR methodologies

Voluntary carbon market

Different degree of <u>maturity</u> of CDR methods

- **High** maturity for **biological** methods
- **Low** maturity for **(geo-)chemical** methods

<u>Mitigation costs</u> vary hugely, by <u>two orders of magnitude</u>

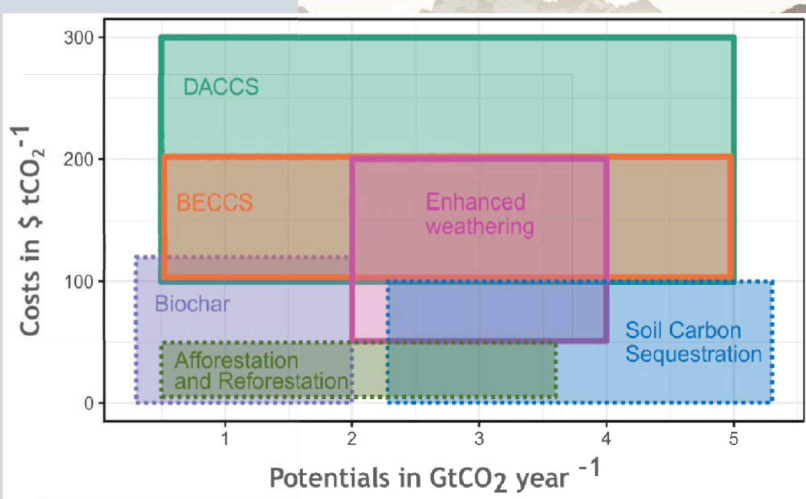
- For most methods costs are **much higher** than for emission reductions
- Only **afforestation / reforestation can currently compete** with emission reductions

<u>Reversal risks</u> vary massively between methods

- Reversal risk generally **negatively correlated** with mitigation costs
- **Biological methods** generally have a **much higher** reversal risk than methods with geological storage (best: basaltic mineralisation)

<u>MRV</u> challenging for some methods

- Methods applied on **large areas** face **high variation in MRV outcomes**
- **Positive / negative impacts on <u>sustainable development</u> vary widely**



Source: IPCC 2018

Timeline of PACM methodology development

The PA crediting mechanism is advancing its regulatory framework

perspectives climate research

SBM 014
Adoption of the standards

COP29
CMA takes note of adopted standards

- SBM to expedite work on **standards, tools and guidelines** (see priorities below)
- To accelerate **revisions** of **CDM** baseline and monitoring **methodologies**

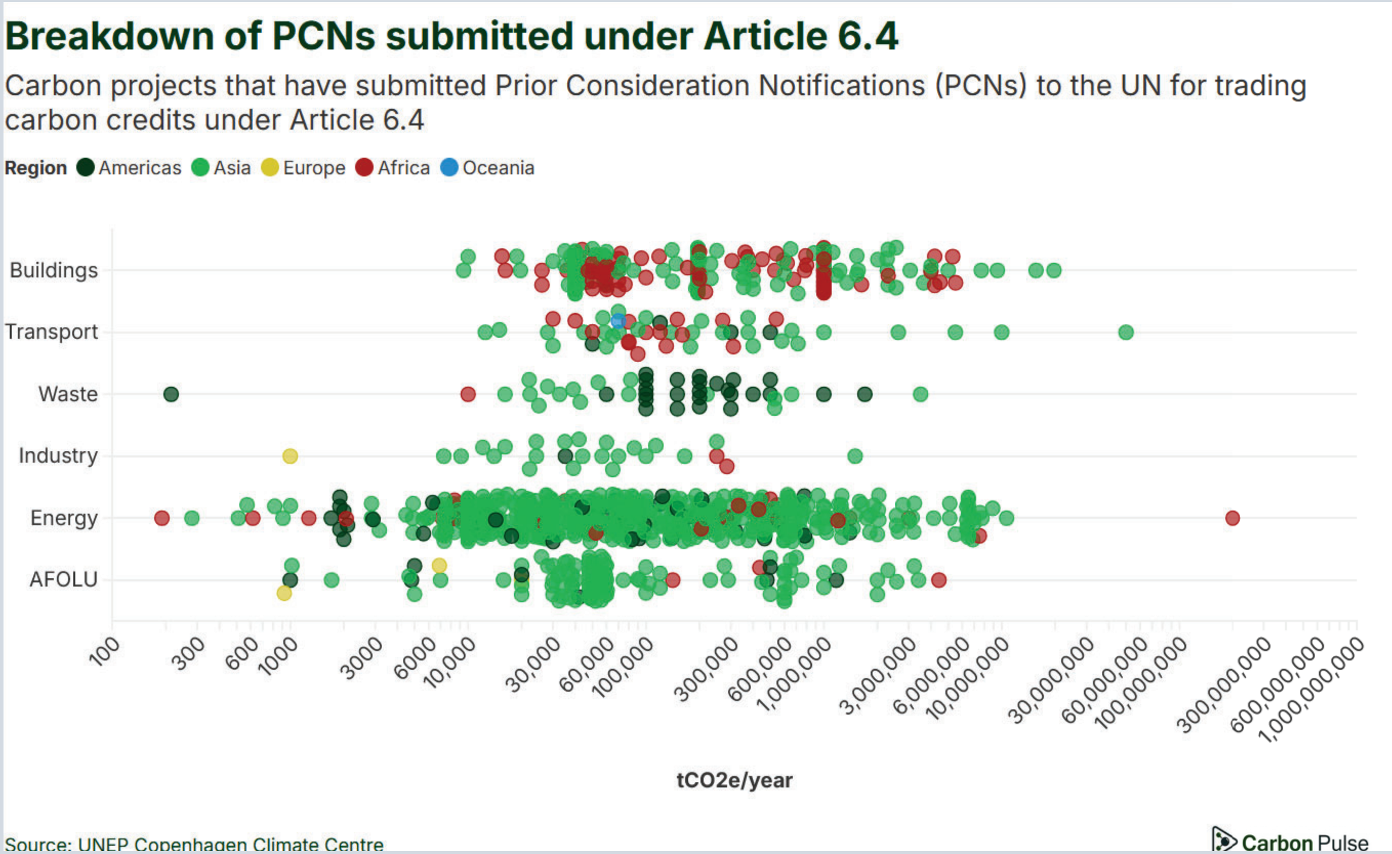
2024 2025 2026

- MEP **priorities**: baselines, downward adjustment, standardized baselines, suppressed demand, additionality, leakage, post-crediting period monitoring, **reversal risk assessments**
- Focus: Revision of **priority CDM meths**: energy, waste, cookstoves, rural electrification, transport

Work related to removals under development by MEP

- **Standard** for Addressing non-permanence / reversals until SBM18
- **Tool:** Reversal-risk assessment until SBM 19
- Limited focus requires finding the right mix of **top-down (UNFCCC/govt)** and **bottom-up (private sector)** efforts for **developing removal methodologies**

Prior consideration for A6.4 activities shows high interest in PACM



Demand outlook: CDR not included in most compliance markets

- Existing compliance markets focus primarily on emission reductions
- EU considering integration into EU ETS; UK clear statement of intent to include removals in UK ETS
    - Carbon Removals and Carbon Farming regulation establishes emerging EU domestic crediting programme
    - New Zealand’s & California’s ETS include forestry
- **How will CDR demand evolve?**
- **Short term (15 years):** market establishment and expansion at limited scale due to early-stage development and open questions on integrity, liability etc.
- **Long term (2050-2070):** increasing shift of carbon markets towards removals as emission reduction credits will no longer accrue once host countries have reached their net-zero targets
- **Public finance and credit demand to catalyze the market**
- **PACM is gaining traction among sovereign buyers, but limited attention on specific certificate demand or technical assistance specifically focusing carbon removals**

Compliance markets