Law and Order: Voluntary Carbon Markets (VCM)

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Presentation Agenda

- Topic Overview
- State of Climate Change
- History of Carbon Trading
- Voluntary Offset Market Analysis
- Recommendations

Introduction

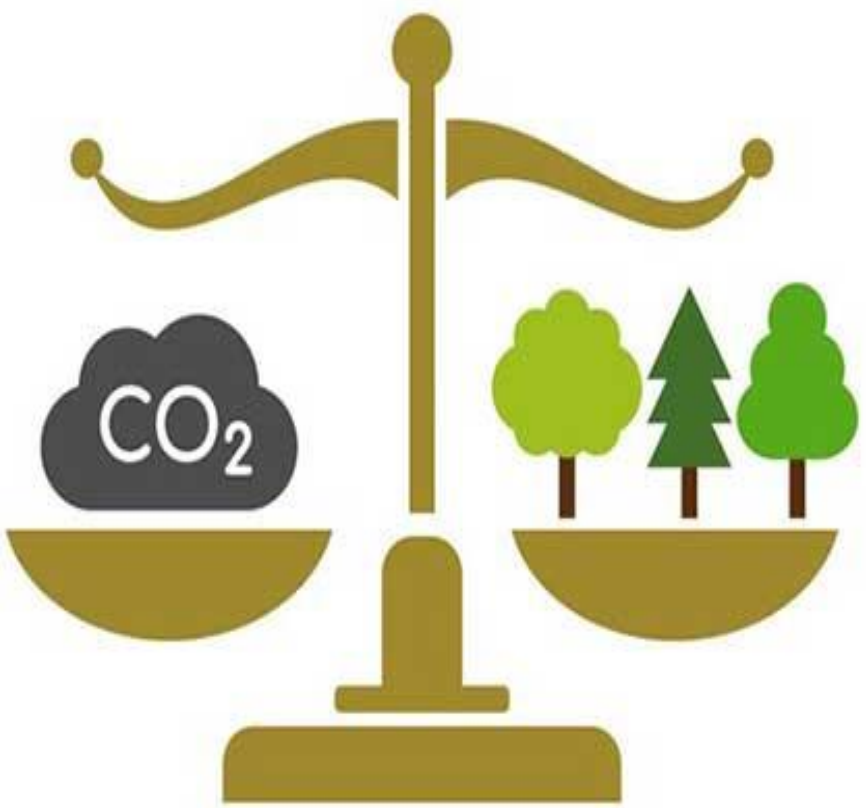
- Businesses show early signs that the transition to net-zero operations and reduced environmental impact may take longer than anticipated, with many companies already falling behind on sustainability goals

- The effects of climate change are revealing that actions must be taken to mitigate irreversible damage to the planet as we know it

- Carbon credit markets offer a tool to manage greenhouse gas emissions, however, pairing a financial incentive with greater scientific validity is needed to yield untapped benefits

Defining the Voluntary Carbon Market

Voluntary Carbon Market (VCM): firms, usually in emission-intensive industries, can offset GHGs released when conducting business by purchasing credits that finance sustainability projects aimed at sequestering carbon



- Carbon offset projects include forest management activities, enhanced farming practices, and emerging carbon capture technologies

- Credits are tradable and each represent the removal of one metric ton of CO_2

Carbon Offset Project Examples

- Wildlife Works Mai Ndombe REDD+ Project, Democratic Republic of Congo
  - Protects nearly 300,000 hectares of forest initially intended for commercial logging
  - Started in March 2011 and registered with Verra
  - Provides economic and social benefits to local communities
- Ahtna Finite Carbon, Alaska, USA
  - Preserving forests that naturally capture carbon
  - Offsets carbon from energy and utilities by preventing CO_2 from deforestation
  - Carbon credits offer an alternative source of income from timber



Top image: Mai Ndombe REDD+. Bottom image: Finite Carbon

Main Takeaways

- Greater scientific expertise is needed to analyze the progress of carbon reductions from offset projects to address integrity challenges hindering the voluntary carbon market and ensure that climate benefits are realized

- Carbon offsets are a necessary tool that support corporate emission reduction goals while financially incentivizing the preservation of natural carbon sinks that may otherwise be destroyed for other uses

- Existing third-party resources including carbon registries, BNEF, and trading platforms track projects and offset prices but monitoring capabilities have room to improve



Key Questions



How can stakeholders in the VCM space correct the issue of inflated climate impact of carbon offset projects?



How can organizations develop an appropriate set of standards that can verify and track the success of carbon offset projects around the world?



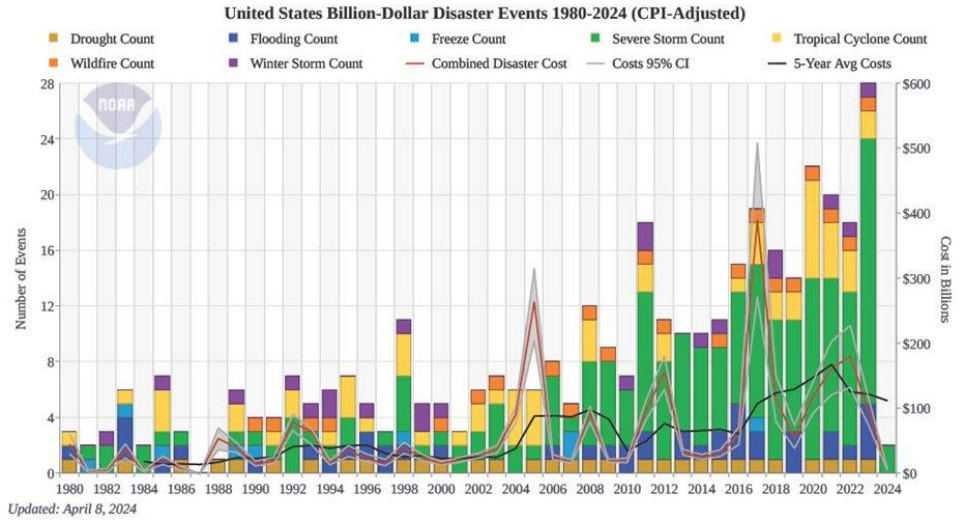
How can the work of atmospheric scientists, technology, and economists advance voluntary carbon markets?

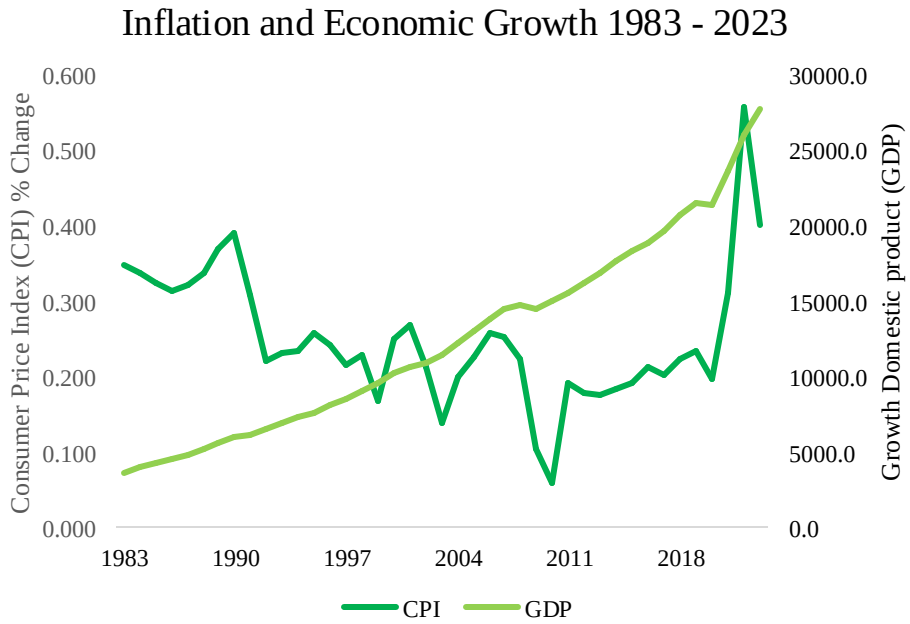
Global Climate Overview

- Earth is quickly approaching the $1.5 - 2^{o}C$ increase in surface temperature that most scientists suggest is the threshold beyond which humans lose control of mitigating climate crisis

- Anthropogenic CO_2 emissions and destruction of natural carbon sinks have intensified the greenhouse effect, trapping more heat in the atmosphere and melting ice needed to regulate sustainable temperatures

- The cost of climate change is rising with amplifying consequences both financially and ecologically





Source: *FRED Economic Data*

History of Carbon Markets: Cap and Trade

Cap and Trade: a mandatory system for governments to reduce air pollution, usually from the utilities sector, by setting a legal cap on CO_2 and selling tradeable emissions permits to businesses

- Cap and trade systems aim to reduce GHGs by allowing the market to determine the price of releasing carbon emissions

- Following the Kyoto Protocol (1997), regional compliance markets such as the EU Emissions Trading System (EU ETS), California Air Resources Board (CARB), and the Regional Greenhouse Gas Initiative (RGGI) covering Eastern US states have flourished



Update on COP29

- Countries have agreed to a centralized carbon market under the UN
  - It is estimated that this trade can yield $250 billion in savings in meeting climate targets
- The Integrity Council for the Voluntary Carbon Market (IVCVM) will be integral to provide standards for high-integrity carbon credits.
- Breakthrough progress for international carbon markets and Article 6
  - Article 6.4, the new framework introduced stricter requirements for removals and stricter methodologies for emissions reductions or removals
  - For Article 6.2, clarity was provided on how countries will authorize carbon credit trade and how tracking registries will operate

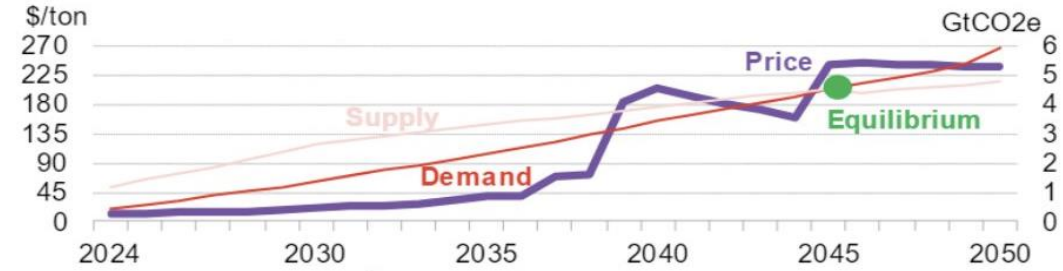
United Nations Climate Change | COP29 Baku Azerbaijan

Use of Bloomberg New Energy Finance (BNEF)

BNEF is a provider of data and research analysis covering global clean energy, commodities, and emerging technologies contributing to a low-carbon economy used by investors, businesses, and government agencies

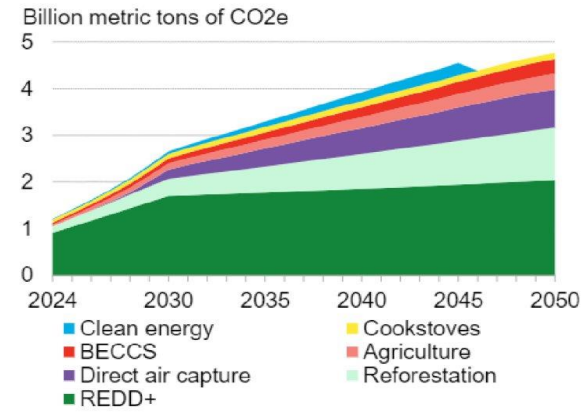
- BNEF analysis projects the price per metric ton of carbon in an optimal scenario reaches ~$230 in 2050
- The supply of carbon offsets now through 2050 will primarily be from forestry projects that avoid deforestation or improve its management
- In 2050 the high-quality scenario could offset ~4.75 bn metric tons of CO_2

High-quality Scenario: Inelastic Demand



Source: BloombergNEF Note: ★ denotes the benchmark demand outlook in this scenario.

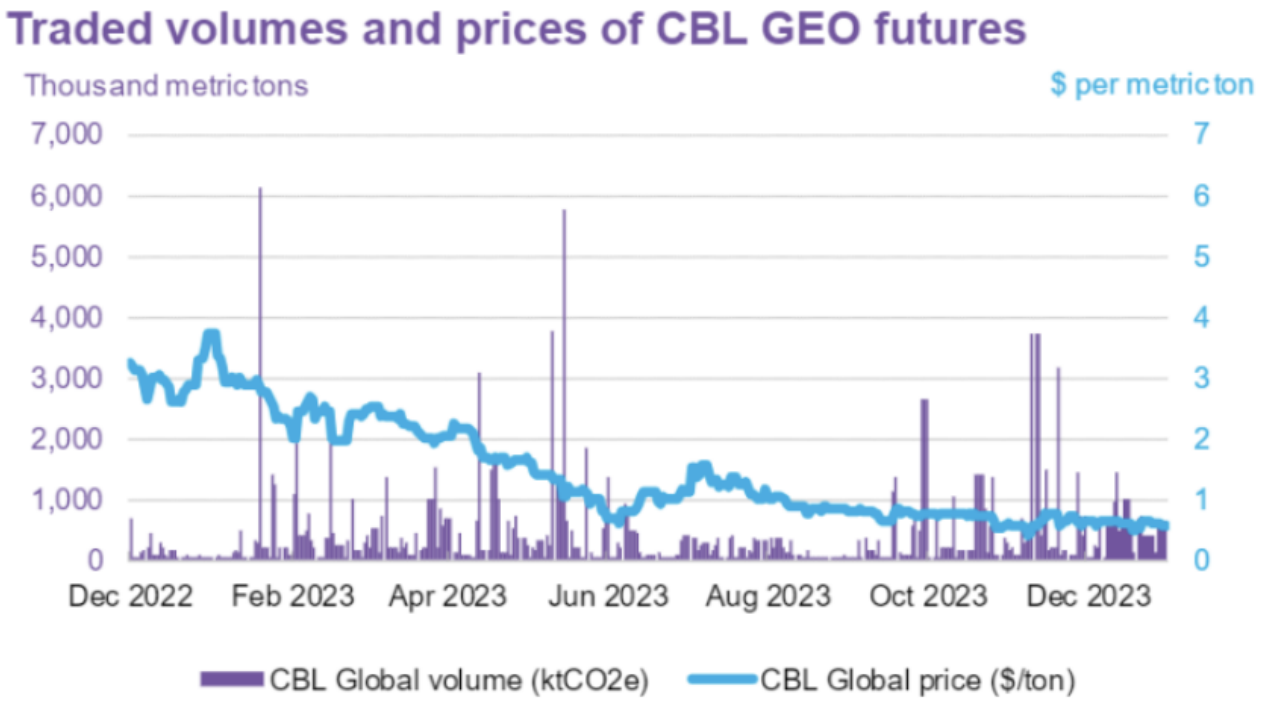
Carbon offset supply in high-quality scenario

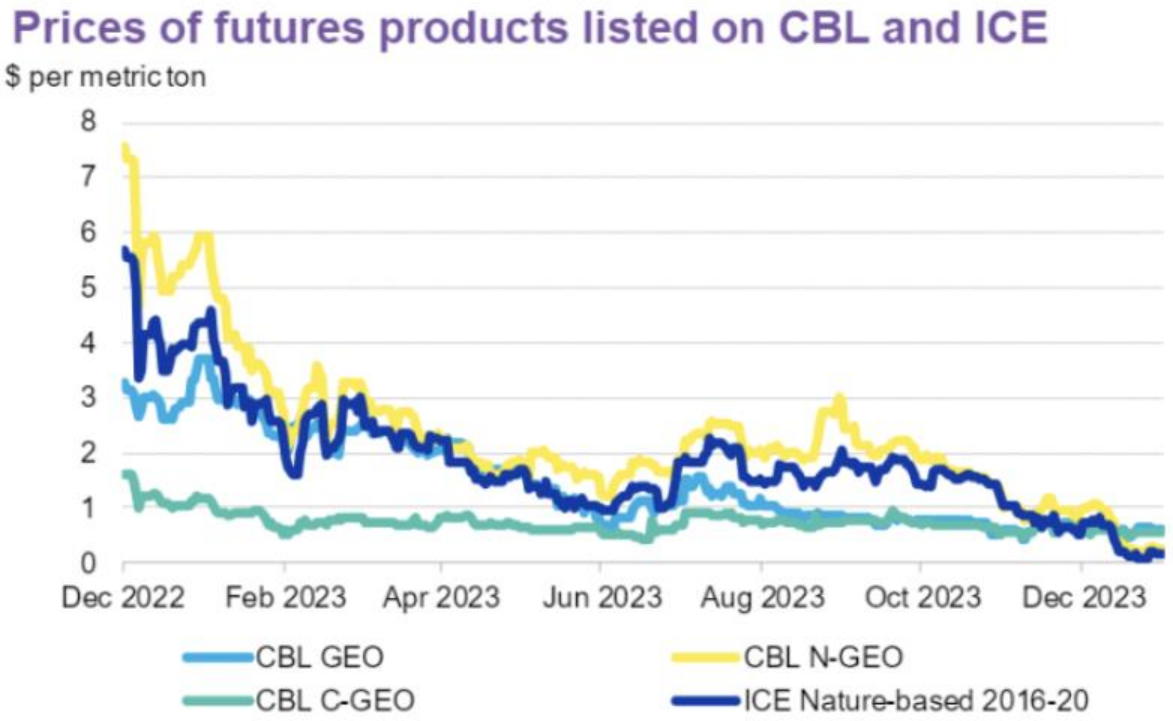


Source: BloombergNEF. Note: BECCS refers to bioenergy with carbon capture and storage; REDD+ is avoid deforestation. One offset = one metric ton of CO2 equivalent.

BloombergNEF

Price Volatility





Note: CBL and Intercontinental Exchange (ICE) are electronic exchanges of commodities.

Images source: *Bloomberg New Energy Finance*

Accelerate Cap and Trade Progress Through Offsets

- The VCM advances cap and trade progress by capturing emissions that disproportionately originate from the energy and transportation sectors, agriculture, and deforestation
- Despite public scrutiny, the overwhelming pressure for businesses and countries to decarbonize without stunting economic growth is driving high valuation estimates for the VCM in the coming years
  - In 2021 the VCM reached ~$2bn in value and transacted ~500 Mt CO_2
  - Some forecasts expect the market to reach between $10bn and $40bn by 2030
- Improving capabilities to capture carbon through natural mechanisms and technology unlocks meaningful opportunities to protect the planet and restore the value of carbon offsets as assets

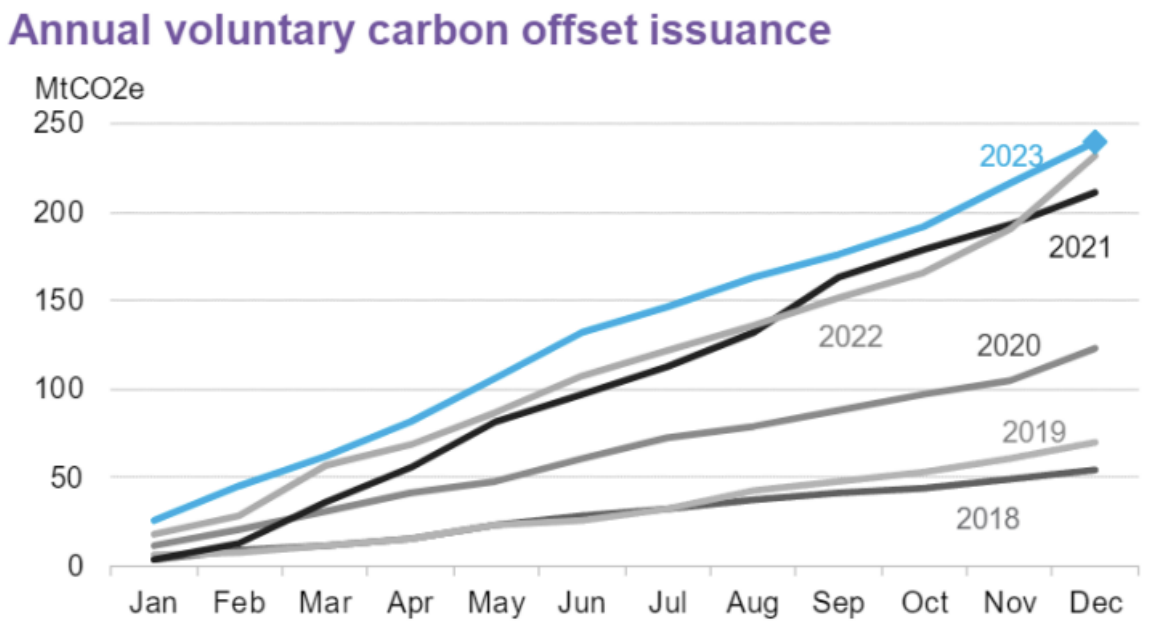


Image source: *Bloomberg New Energy Finance*

VCMs Are Still Emerging

Challenges	Opportunities
• **Transparency**	• **Paris Agreement Article 6**
• **Price volatility**	• **Carbon removal technology**
• **Carbon Accounting**	• **Artificial intelligence**

Role of Third-Party Stakeholders

- **Registries:** non-profit organizations that issue and track carbon credits for sustainable projects based on protocols and scientific methodologies

- **Financial platforms:** trading platforms for matching buyers with sellers and providing product information and price transparency, accounting firms can offer consulting and auditing services to track clients' carbon offsets

- **Standards bodies & raters:** organizations that set the standards for high quality carbon credits and agencies that rate offset projects accordingly



Recommendations

- Expand the use and development of carbon capture and storage (CCS) technologies in the US through increased financial and scientific support
    - Notable start-ups include Climeworks 1PointFive, and proprietary ventures from major oil companies

- Create a centralized place to track and audit the progress of nature-based offset solutions to better serve scientists, corporate buyers, and investors

- Stay informed and follow industry changes



Direct air capture plant in Hinwil, Switzerland.
Source: *Climeworks*

Acknowledgements

Thank you to the Department of Atmospheric and Oceanic Science and the Department of Finance at the University of Maryland for wonderful academic opportunities.

Thank you Dr. Brammer for creating the Climate Finance Competition and unwavering support throughout this entire experience.

Thank You for Listening!

Questions?

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