

LAZARD CLIMATE CENTER
A FRAMEWORK FOR DEVELOPING THE CARBON OFFSETS MARKET

Authors

Joseph Aldy
*Lazard Senior Advisor,
Professor of the Practice of Public Policy
Harvard Kennedy School*

Zachery Halem
*Director of the
Lazard Climate Center*

Support

Tamsin Nottage
*Summer Analyst,
Lazard Climate Center*

Quinn Pitcher
*Associate,
Capital Markets Advisory*

Executive Summary

- **The Lazard Climate Center has issued a working paper entitled “[The Evolving Role of Greenhouse Gas Emission Offsets in Combating Climate Change](#),” which explores the role of offsets in regulatory compliance, as an incentive for early action, and in implementing voluntary emission goals**
- **The voluntary offsets market has grown significantly in recent years (reaching 300 MMTCO₂ in volume in 2021), and the Taskforce on Scaling Voluntary Carbon Markets projected that the market could reach \$50 billion in value by 2030**
- **Yet, substantial limitations in the current voluntary offsets market persist, mainly revolving around price disparities (heterogeneity across regions and registries) and concerns around environmental integrity**
 - Questions on offsets’ additionality, permanence, double-counting, and leakage pose environmental, economic, and political challenges
- **Based on the properties of offsets, an array of financial and technological innovations could enhance offsets’ environmental integrity and promote liquid offset markets**
 - Commoditizing offsets by creating standardized contracts and futures would allow the market to achieve convergence on pricing
 - Project insurance and related instruments could mitigate the risk of decarbonization delivery and lack of permanence
 - Technological advancements, like satellite imagery and blockchain, could enhance abatement visibility and limit double-counting
- **The SEC’s proposed climate disclosure rule would require companies to publicize how they use offsets as a part of their emissions reduction plans and necessitate corporate scrutiny of offset projects’ financial and environmental integrity**

What is an Offset?

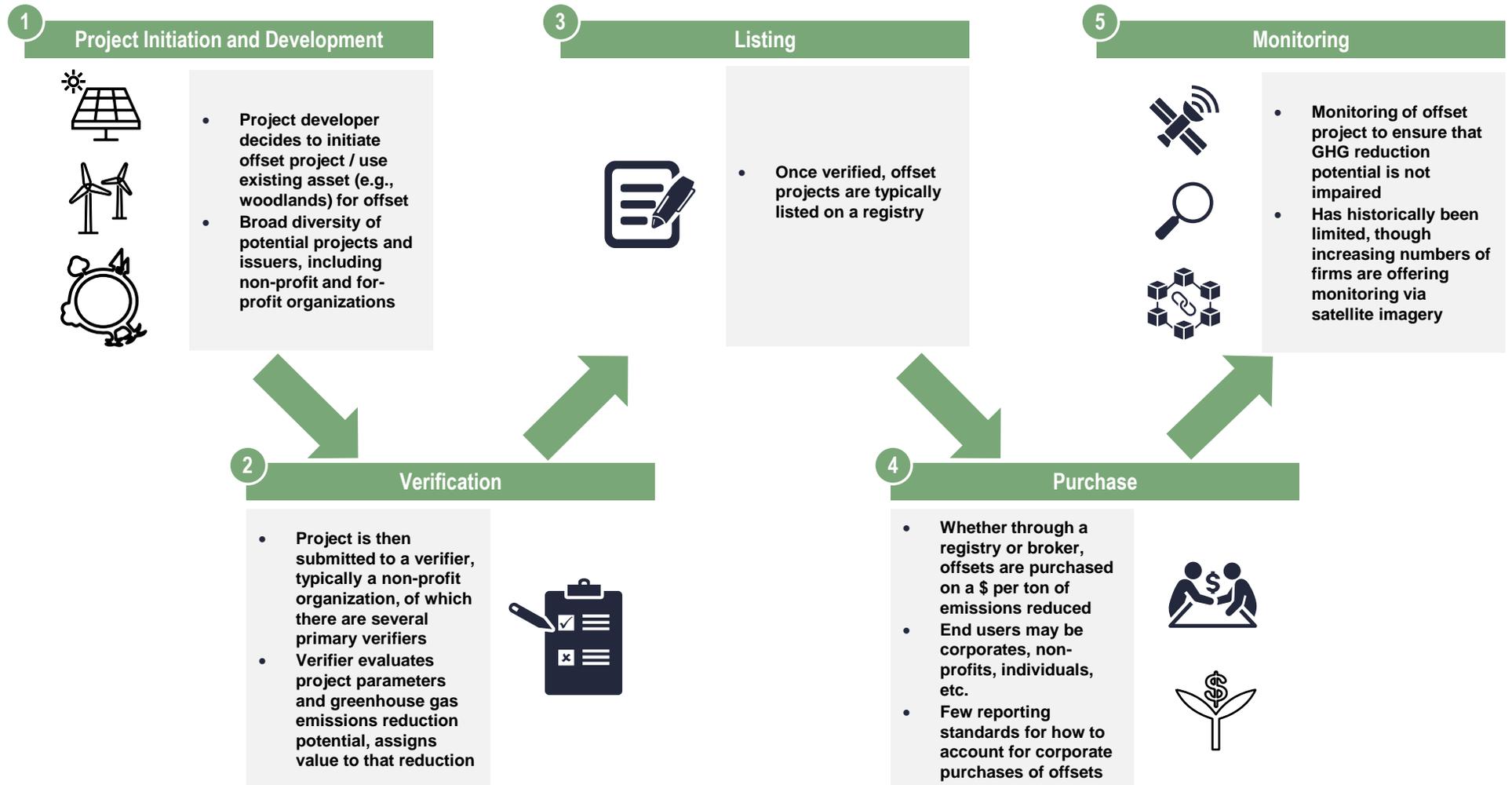
Carbon offsets represent the estimated emission reduction (or removal from the atmosphere) from a project or activity that may be sold to a purchaser – typically corporations – to offset emissions within its corporate footprint and demonstrate progress on its emission goal

Key Characteristics of Offsets

<p>Historical Evolution</p>	<ul style="list-style-type: none"> • Offsets emerged as a cost-effective means of complying with Clean Air Act regulations, which allowed firms to build emitting facilities if they could reduce greenhouse gas output from nearby sources • The 1997 Kyoto Protocol established the Clean Development Mechanism (CDM), which enabled developed countries to demonstrate progress on their emission targets by financing developing country clean energy investments <ul style="list-style-type: none"> – The CDM facilitates the registration, verification, and sale of carbon offset projects in developing nations – Developed country governments could purchase CDM offset credits as part of their compliance strategy under the protocol – The EU Emissions Trading Scheme allowed regulated firms to purchase CDM credits and use them for compliance in this cap-and-trade market
<p>What Does an Offset Represent?</p>	<ul style="list-style-type: none"> • Purchasable asset used to finance emission-reducing or sequestering projects • In regulated cap-and-trade markets, offsets can grant the holder the right to emit on par with the comparable volume of emission allowances and represent a potentially cost-effective option to demonstrate regulatory compliance
<p>Who Purchases Offsets?</p>	<ul style="list-style-type: none"> • Mainly corporations seeking to reduce their greenhouse gas emissions levels <ul style="list-style-type: none"> – Firms purchased \$107 million worth of carbon offsets during the first eight months of 2021, \$35 million more than the previous year (Forest Trends' Ecosystem Marketplace, 2021)
<p>Why do Corporations Purchase Offsets?</p>	<ul style="list-style-type: none"> • Offsets give firms more flexibility in meeting emission-reduction and net-zero goals, accounting for expensive, difficult-to-eliminate residual carbon emissions in a cost-effective manner

How Does an Offset Get Produced?

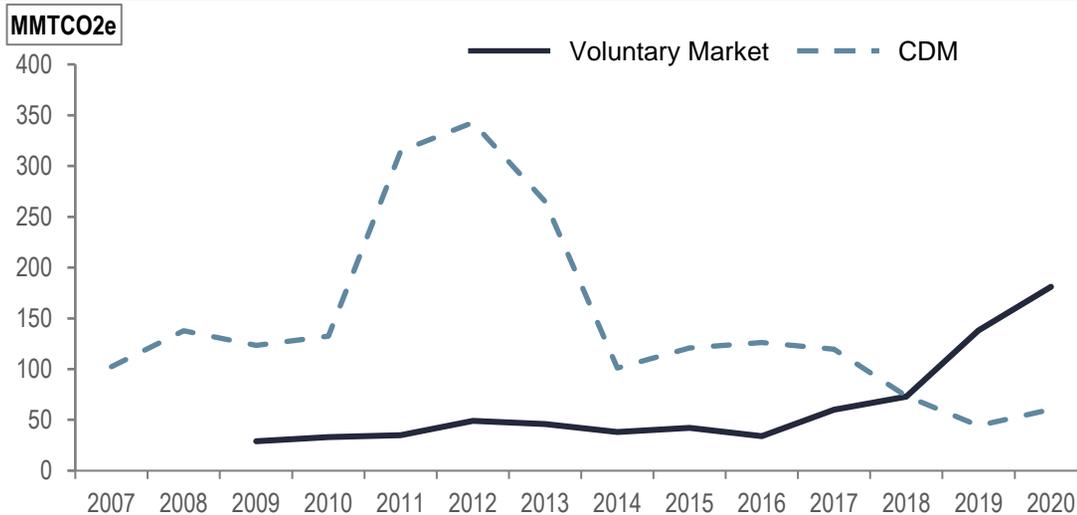
The process to initiate, verify, list, and sell carbon offsets from a project can be time- and resource-intensive. Once a purchaser acquires an offset, there often remains the question of the monitoring of the offset's environmental integrity.



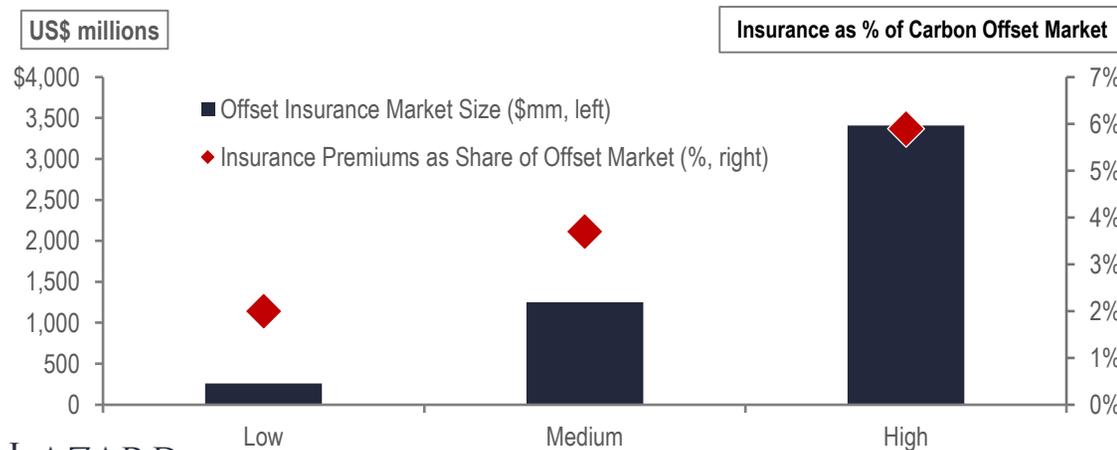
Growth in the Voluntary Offsets Market

The voluntary offsets market has seen rapid growth since the start of 2017, tripling in size (in terms of millions of metric tons of CO2 equivalent), and is expected to continue its rapid growth given the magnitude of corporate “net zero” commitments.

CDM and Voluntary Market Offset Volumes, million metric tons of CO2-equivalent, 2007-2020



Projections of the Voluntary Carbon-linked Insurance Market in 2030

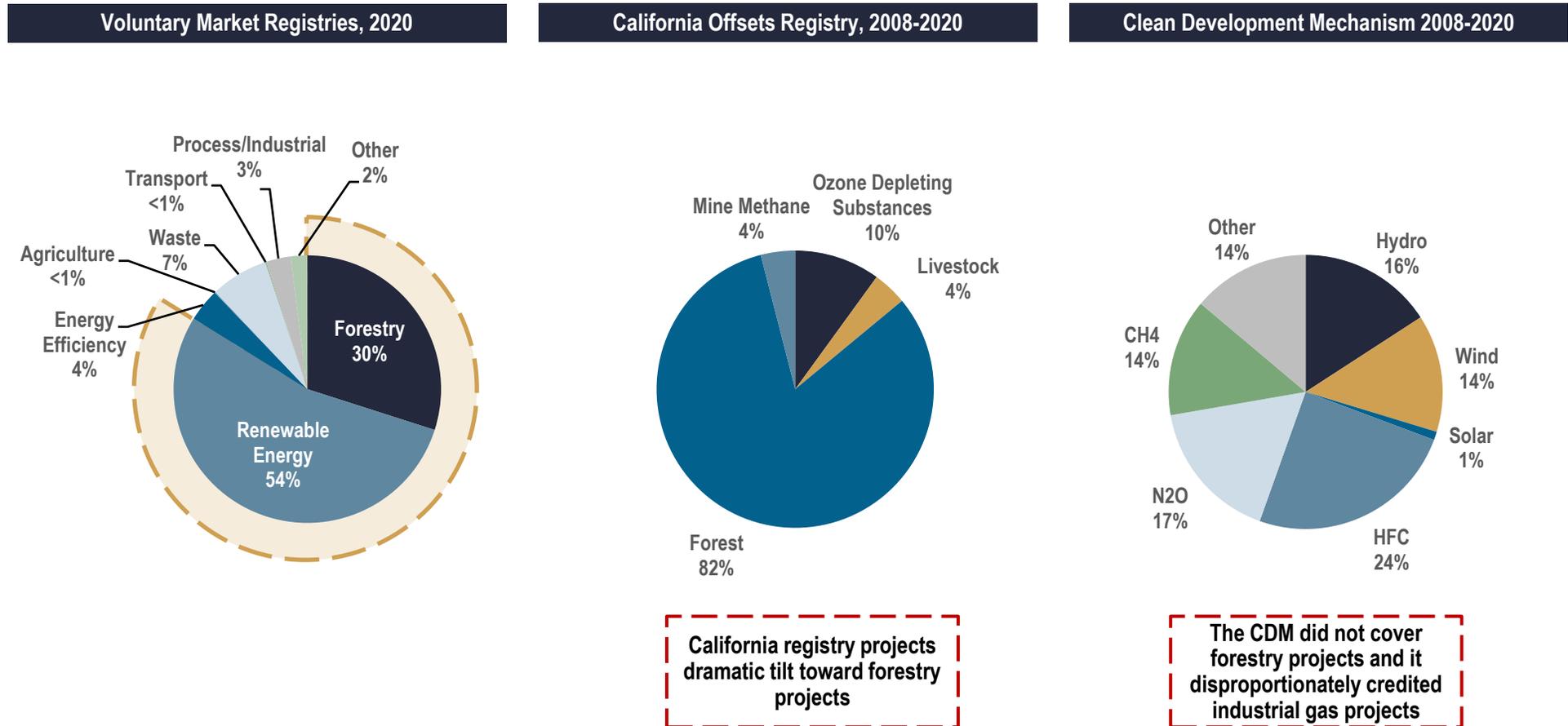


Observations

- The CDM demonstrated peak demand for offsets in 2012, with developing countries’ projects generating 350 million metric tons of credits
- After 2012, the EU set qualitative and quantitative limits on the use of CDM credits, reflecting concerns about the environmental integrity of CDM projects
- These restrictions depressed demand for CDM credits, and offsets issued through the CDM declined more than 80% over 2012-2020
- Starting in 2016, the demand for offsets shifted to universities and firms that sought to demonstrate progress on their own voluntary emission goals
- Consumer demand for emission offsets – such as for airline travel – also emerged as a driver for emission reductions
- As a result, the voluntary offsets market in 2021 had reached 300 MMTCO2 in volume

What Kinds of Projects Comprise Voluntary Offsets?

Offsets projects vary markedly based on the type of marketplace; renewable energy and forestry-related projects comprise over 80% of the voluntary market.



Limitations of the Current Offsets Market

The heterogeneity in offset prices by verification standard, geography, type of project, and buyer reflect considerable uncertainty – and variation in methods attempting to reduce uncertainty – about the environmental integrity of emission offset projects

1 Inframarginal Offsets

- Rewarding projects with offset credit that would have happened anyway

2 Greenwashing and Emission Loopholes

- Concerns that a purchaser may acquire low-cost, low-environmental integrity carbon offsets for the sake of improving its sustainability image

3 Counterfactual Evaluation

- Evaluating the unobserved counterfactual – the level of emissions that would have resulted in the absence of the project generating offsets – is challenging and the prospect of manipulating project baselines could bias the estimated offsets for projects

4 Double-Counting

- Double-counting can occur through double issuance, use, and claiming; efforts at enhancing transparency in registering offsets can address some concerns about double-counting

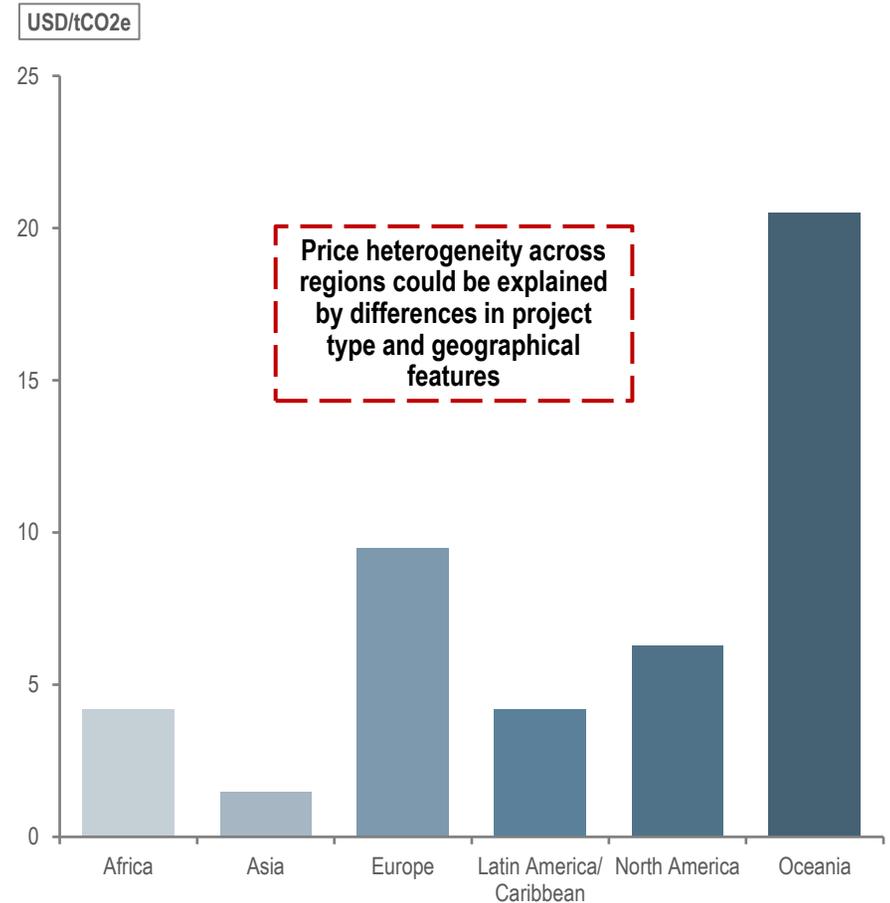
5 Emission Leakage and Firm Liability

- An offset project could influence the economics of energy and land use activities beyond the scope of the project – emission leakage – which could increase emissions that reduce the net environmental benefit of the offsets project
- Emission offsets from forestry projects raise questions about whether the offset issuer or the offset purchaser bears liability for emissions that may occur if the project is not permanent

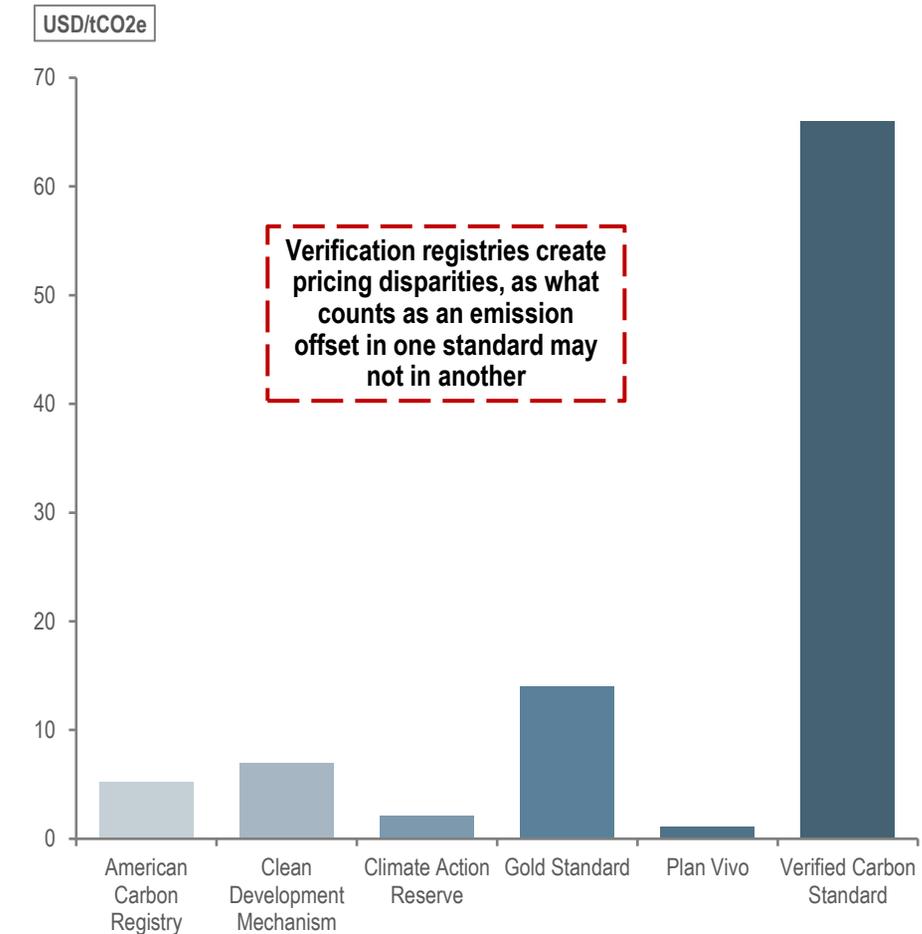
Limitations of the Current Offsets Market (cont'd)

Offset prices are characterized by significant heterogeneity across regions and registries, indicative of the challenges surrounding accurately pricing the emissions reductions generated by offset projects.

Offset Prices by Region, 2020



Offset Prices by Verification Standard, 2020



Toward a More Robust Offsets Market

With the objective of improving liquidity, demand, and efficiency within the voluntary offsets market, several factors must be taken into consideration.

Topic	Overview
Commoditization of Offsets	<ul style="list-style-type: none"> • In employing financial categorization techniques, such as creating offset contracts and futures to commoditize and standardize voluntary offsets, the market can achieve convergence on offset pricing, reducing price dispersion
Quality Verification and Information Availability	<ul style="list-style-type: none"> • Improving access to information to standardize quality verification of carbon offset projects can ensure the proliferation of high-quality offsets with tangible environmental integrity ratings
Project Insurance	<ul style="list-style-type: none"> • In the event that natural disasters or other factors undermine the permanence of nature-based offsets, creating an offset insurance market can mitigate concerns about the environmental integrity of these offset strategies
Diversification of Offset-backed Security Portfolios	<ul style="list-style-type: none"> • Creating securities backed by portfolios of offsets projects could reduce the risk buyers face of project-specific environmental failures and maximize material impact through diversification of project types. Such instruments could also lower the cost of financing the supply of offsets
Technological Advancements and Double-Counting Regulation	<ul style="list-style-type: none"> • Innovations like satellite technology to measure offset emission impact can help with valuation challenges, improving market efficiency • Blockchain technology for monitoring offset transactions can potentially reduce risks associated with double-counting challenges, as the information can be distributed easily and securely, and non-fungible tokens (NFTs) associated with each transaction can be created to track uniqueness

Policy Implications

Voluntary carbon markets could influence the future development of public policy and future regulatory actions could influence the further evolution of emission offsetting activities and the voluntary market more generally

Regulatory Policy	Transparency and Quality Control	Risk Management	Carbon Border Adjustments
<ul style="list-style-type: none">• Increasing the presence of the voluntary offsets market may be able to facilitate the implementation of a national carbon pricing policy, which would aid in more widespread activity in emission reduction across all sectors• Standardizing offset valuation could inform carbon tax pricing and other regulatory policies like clean electricity standards and the cap-and-trade program	<ul style="list-style-type: none">• In light of the SEC’s proposal to require public companies to disclose their emissions, greater transparency in offset emission verification and accounting could arise, helping to create a minimum environmental integrity standard to which all buyers of offsets would adhere	<ul style="list-style-type: none">• Information collection of environmental integrity standards can inform risk management instruments, which can decrease emission leakage and firm liability concerns, as well as help construct an associated insurance and accounting framework	<ul style="list-style-type: none">• With growing interest in tariffs on the carbon content of imported goods, emission offsets could serve as a way for the manufacturer of the imported good to demonstrate lower carbon intensity and bear a lower tariff

The Future of Offsets Regulation and Implications for Companies

The SEC's proposed climate disclosure rules, if implemented as proposed, would increase the degree of transparency around corporate usage of offsets that will likely impact how corporates think about their usage of offsets and how they communicate that usage publicly.

- The proposed rule would require companies that use offsets as part of emission reduction action plans to disclose the amount of abatement attributed to offsets purchases

Implications for Companies

- 1 Increased transparency around offsets use will force companies to think more carefully about the quality and nature of the offsets they purchase
- 2 Heightened disclosure may also help aid price discovery in the offsets market and contribute to pricing alignment across regions and registries
- 3 Accusations of corporate “greenwashing” through the usage of offsets are only likely to be amplified as the amount of information available increases
- 4 Companies that take an active approach in evaluating the longer-term nature of their offsets use and the associated stream of emissions reductions will be best-positioned to manage their emissions profile and messaging around long-term climate goals

Disclaimer

These materials have been prepared by Lazard for general informational purposes only and they are not intended to be, and should not be construed as, financial, legal or other advice.

In preparing these materials, Lazard has assumed and relied upon the accuracy and completeness of any publicly available information and of any other information made available to Lazard by any third parties, and Lazard has not assumed any responsibility for any independent verification of any of such information. These materials are based upon economic, monetary, market and other conditions as in effect on, and the information available to Lazard as of, the date hereof, unless indicated otherwise. Subsequent developments may affect the information set out in this document and Lazard assumes no responsibility for updating or revising these materials.

These materials may include certain statements regarding future conditions and events. These statements and the conditions and events they describe are inherently subject to uncertainty, and there can be no assurance that any of the future conditions or events described in these materials will be realized. In fact, actual future conditions and events may differ materially from what is described in these materials. Lazard assumes no responsibility for the realization (or lack of realization) of any future conditions or events described in these materials.

Nothing herein shall constitute a commitment or undertaking on the part of Lazard to provide any service. Lazard shall have no duties or obligations to you in respect of these materials or other advice provided to you, except to the extent specifically set forth in an engagement or other written agreement, if any, that is entered into by Lazard and you.