ROBECO
The Investment Engineers

WHITE PAPER

Leveraging carbon markets for climate investing

Roles and opportunities for investors

Sustainable Investing Expertise by ROBECOSAM

Contents

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Introduction

Carbon markets are essential to achieving the objectives of the Paris Climate Agreement. However, they are not immune to the risks associated with greenwashing, which makes it challenging for investors to operate within this space. In this paper, we explain how carbon markets are organized and how investors can navigate this landscape while effectively mitigating the risks.

Love them or hate them, carbon markets are here to stay. These markets serve the purpose of assigning a monetary value to carbon emissions, channeling capital towards the most economically viable solutions for mitigating climate change. In fact, carbon markets have the potential to halve the costs associated with implementing the Paris Climate Agreement.[1]

However, at present, carbon markets face significant challenges concerning their integrity and reliability. Numerous instances of carbon credit projects exaggerating their emissions reduction accomplishments have been highlighted in the media over the past few years. Consequently, the very concept of carbon offsetting is being called into question, as an increasing number of cases emerge where organizations seem to adopt offsetting to defer meaningful climate action.

As a result, investors who may have a genuine interest in using carbon credits as part of their climate action plans face substantial reputation risks. This raises important questions: What opportunities are available for investors regarding carbon credits? Under what conditions can carbon credits genuinely contribute to net-zero strategies? And how can investors effectively manage the associated risks? This paper aims to address these critical questions and prove valuable insights on navigating the complexities of carbon credits within the context of climate change.

“ Love them or hate them, carbon markets are here to stay

Box 1. Glossary

A carbon credit is an emissions unit that is issued by a carbon crediting scheme and represents a reduction or removal of greenhouse gas emissions. Carbon credits are uniquely serialized, issued, tracked, and cancelled by means of an electronic registry.

A carbon offset is a payment to purchase a credit for a certified unit of emissions reduction or removal carried out by another actor.

In this paper, we use the term carbon credit to refer to all forms of tradeable emissions units. There are however different types:
- Carbon allowances: In compliance carbon markets, such as the EU Emissions Trading Scheme, governments impose a regulatory cap on emissions for specific industries. Beyond this, allowances for excess emissions must be purchased in the market, where unused allowances may also be sold.
- Carbon credits: In voluntary carbon markets, corporate emitters can voluntarily buy carbon offsets, certified by private standards, to compensate for or neutralize their unabated emissions.

There are two major types of carbon credits:
- Removal credits are generated by projects that remove carbon dioxide directly from the atmosphere. Examples include reforestation, soil carbon enhancement and direct air capture with geological storage.
- Avoidance credits are created, for example, by renewable energy or forest conservation projects. Avoided emissions are theoretical emissions reductions measured against a future projected baseline level of emissions. They do not therefore actually reduce atmospheric carbon levels.

[1] International Emissions Trading Association (2019), The Economic Potential of Article 6 of the Paris Agreement and Implementation Challenges.

The basics of carbon markets

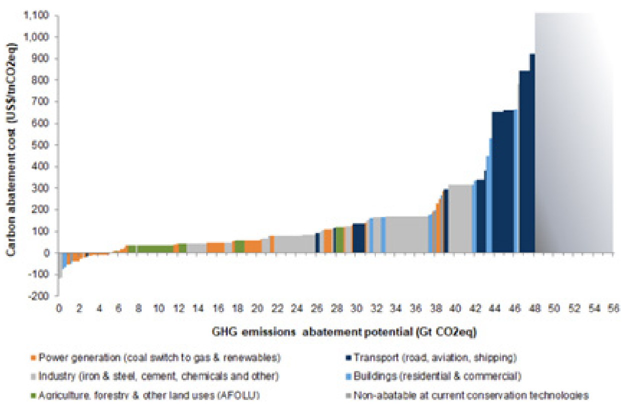
How are carbon markets organized and how have they developed in recent years? This chapter provides a basic introduction to carbon markets.

The purpose of carbon markets

The purpose of carbon markets is widely acknowledged among economists as crucial for addressing global warming. By assigning a price to carbon emissions, carbon markets create incentives for polluters to adopt low-carbon technologies and discourage carbon-intensive practices. Moreover, the offer rewards for activities that sequester carbon, such as reforestation or direct air capture and storage.

Figure 1 illustrates the significant variation in carbon abatement costs across sectors. Carbon markets play a vital role in directing capital flow across industries and countries, expediting the development of cost-effective climate solutions. As a result, carbon markets have the potential to halve the costs associated with achieving the targets established by the Paris Climate Agreement.[2]

Figure 1. Greenhouse gas abatement curve. Carbon markets help to direct capital flow to the most economically viable solutions.



Source: Goldman Sachs Investment Research (2021)

The current state of carbon markets

While there is widespread recognition of the importance of carbon markets, these markets remain highly fragmented. Currently, there are 71 carbon pricing schemes being implemented at the national, sub-national or regional level, collectively covering approximately 23% of global greenhouse gas emissions. It is worth noting that not all of these schemes are carbon markets; 34 are carbon taxes, while 37 are markets where emitters can trade carbon credits.[3]

The prices of carbon vary significantly, ranging from USD 137 per ton of CO2e in Uruguay to less than a dollar per ton in Poland and China. The average global carbon price stands at approximately USD 3 per ton,[4] significantly below levels required to drive the transformative change necessary to achieve the 1.5°C target. The High-Level Commission on Carbon Prices identified a price range of USD 50-100 per ton by 2030 as the necessary threshold to limit global heating to below 2°C.[5] However, carbon prices within or above this range cover less than 4% of global emissions in 2022.

Nevertheless, recent growth in carbon market coverage has been robust. Just two years ago, carbon market coverage was at 14% of global emissions, and it has already increased to 23% today. The revenue collected by authorities collected from carbon schemes amounted to USD 84 billion in 2021, primarily driven by price increases in the EU Emissions Trading Scheme – the world's leading carbon pricing scheme, responsible for 41% of global carbon revenue. It is important to note that the Chinese national emissions trading scheme, which is the largest in terms of covered emissions, allocated all its 2021 allowances freely as it is still in the pilot phase.[6]

Types of carbon markets

Compliance markets

The EU Emissions Trading Scheme serves as an exemplar of a compliance market, which operates under a regulated regime at the national or regional level. In compliance markets, carbon credits are traded within a framework of regulations. Governments impose caps on specific industry sectors, and companies that exceed their allocated allowances must purchase additional allowances in the market to cover their excess emissions. Currently, there are 24 emissions trading schemes in force globally, including majors ones in the EU, California, China and the UK. Eight more schemes are set to come into operation in the coming years, and an additional 14 schemes are under consideration. In 2021, compliance markets

[2] International Emissions Trading Association (2019), The Economic Potential of Article 6 of the Paris Agreement and Implementation Challenges.
[3] The World Bank (2022), State and trends of carbon pricing 2022.
[4] International Monetary Fund (2021), Climate staff note, Carbon pricing: what role for border carbon adjustments?
[5] Report of the High-Level Commission on Carbon Pricing (2017). These price estimations are now considered conservative, because the policy ambition has been raised to a 1.5°C target, and delays in action since 2017 have raised the costs of action today.
[6] World Bank (2022), State and trends of carbon pricing 2022.

had an estimated total market value of USD 270 billion, with a trading value of approximately USD 850 billion.[7] The global weighted-average price of carbon in these markets stands at USD 28 per ton.[8]

Box 2. The EU Emissions Trading Scheme (ETS): the world's leading carbon market

The EU ETS serves as the main instrument for implementing EU climate policy. Each year, the Commission conducts auctions of allowances, which companies must purchase to offset their greenhouse gas emissions. Certain credits, such as those allocated to airlines, are distributed for free according to stringent rules.

Currently, the ETS covers 40% of the EU's emissions, encompassing crucial sectors such as energy, airlines and manufacturing. In the coming years, the ETS will be expanded to cover 60% of the EU's emissions.

Trading of EU carbon allowances commenced in 2005, although initially, the allocation of free allowances exceeded demand, partly due to the financial crisis in 2008. This resulted in low market prices. The market gained significant traction in 2019 with the introduction of the Market Stability Reserve. The Reserve facilitates the back-loading of credits from the market, reducing supply and boosting prices.

Presently, prices stand at around EUR 90 per ton of CO2e, representing a substantial cost that effectively drives the transition towards low-carbon alternatives. While short-term prices correlate with fossil fuel prices, their long-term trajectory is primarily influenced by policy measures. Stricter European emissions regulations lead to a reduction in the supply of carbon credits, consequently driving price increases.

Over the coming years, the allocation of free allowances will gradually decrease as the EU introduces the Carbon Border Adjustment Mechanism (CBAM). The CBAM imposes a price on emissions embedded in imported products entering the EU. This mechanism aims to prevent 'carbon leakage', where carbon-intensive production relocates to other regions.

Compliance markets are highly regulated cap-and-trade systems that enable regulators to allocate emissions allowances to specific sectors, in alignment with predetermined decarbonization targets. As emissions caps progressively decrease over time, carbon prices experience upward pressure, effectively penalizing companies that surpass their allowable emissions. Compliance markets have the potential for significant growth as they expand to encompass more countries and industries, although they currently remain relatively small in comparison to commodity markets. Analysts at Credit Suisse estimate that the value of carbon compliance markets could reach USD 1 trillion by 2030.[9]

Voluntary carbon markets

In voluntary markets, carbon credits are traded by private entities, without government involvement. Carbon credits are generated through projects established by carbon credit companies in collaboration with local partners. To create a carbon credit, a project must adhere to the standards and protocols set by an independent carbon-crediting program, also known as carbon standards. Several carbon-crediting programs exist, with leading roles including Verra/VCS, Gold Standard, and American Carbon Registry. These programs validate the emissions reduction claims of a project, considering factors such as additionality (whether the emissions reduction would have occurred without the project), permanence (the durability of emissions reductions), leakage (potential emissions shifting from one place to another), and social-environmental outcomes (benefits to communities and biodiversity).

The voluntary carbon market has experienced exponential growth, reaching nearly USD 2 billion in 2022 from USD 300 million in 2020.[10] Demand has surged in recent years, as many companies incorporate carbon offsets into their net-zero plans. Main buyers include energy companies, airlines and car manufacturers. The average market price in 2022 stood at USD 8.8 per ton of CO2e, representing a 40% increase from the previous year.[11]

Driven by corporate aspirations to offset their emissions, the voluntary market is projected to reach at least USD 10-30 billion by 2030.[12] In a 1.5-degree scenario, the voluntary market could grow up to USD 180 billion by 2030.[13] However, market growth is hindered by market fragmentation and the lack of transparency regarding credit quality. The existing system of multiple carbon-crediting programs falls short in providing adequate assurance and transparency, thereby exposing buyers to reputational risks associated with low-quality projects.

To address these issues, market participants established the

7 Credit Suisse (2022), Carbon Markets: the beginnings of the big carbon age; Refinitiv (2022), Review of carbon markets in 2021.
8 Credit Suisse (2022), Carbon Markets: the beginnings of the big carbon age.
9 Ibid.
10 Ecosystem Marketplace (2022), State of the voluntary carbon markets 2022.
11 Trove Research (2022), Voluntary carbon market 2022 in review.
12 Trove research.
13 GIC, EDB and McKinsey (2021), Putting carbon markets to work on the path to net zero.
14 https://icvcm.org/.

Integrity Council for Voluntary Carbon Markets in 2021.[14] In March 2023, the Council released a set of core carbon principles for public consultation. These principles are intended to become a new meta standard for high-quality carbon credits, as explained in more detail in the next chapter.

Box 3. Article 6 of the Paris Agreement: towards a global carbon market

A well-functioning global carbon market is crucial for achieving the objectives set out in the Paris Agreement, as outlined in its renowned Article 6. Governments engaged in negotiations for years to establish the rules for implementing Article 6, eventually reaching an agreement at the COP26 climate summit in Glasgow in 2021. One significant challenge during the negotiations was determining the fate of the world's first global carbon market.

The Clean Development Mechanism (CDM) was established under the 1997 Kyoto Protocol. It generated 1.6 billion credits through 7,900 projects, with a total cost of almost USD 100 billion. The CDM market became operational in 2005, and CDM credits were traded on major commodity exchanges worldwide. However, the CDM market faced two primary obstacles. Firstly, demand remained low, as major emitters, such as the US and China, were exempted, while the EU experienced a recession due to the global financial crisis. Secondly, market confidence waned due to concerns about the additionality and quality of CDM credits. Consequently, the market collapsed, leaving thousands of projects with unclaimed credits.[15]

In 2015, the Paris Agreement aimed to replace the CDM with its Article 6, allowing countries to partially achieve their climate policy goals through trading emission rights known as Internationally Traded Mitigation Outcomes (ITMOs). At the Glasgow summit, countries agreed to allow a certain amount of the old CDM credits into the new system, while new credits would adhere to strict rules to ensure high quality. Agreements were also reached regarding rules to prevent double counting, a 5% allocation of credits to a fund for developing countries, and a 2% automatic cancellation share to ensure global emission reduction.

ITMO trade can occur bilaterally between two governments or through a centralized hub accessible to both public and private actors. Consequently, the voluntary carbon market will become more intertwined with compliance markets and the formal climate targets of governments. Voluntary carbon credits can acquire a 'host country authorization' for use under Article 6, making them desirable to certain buyers.

Facilitated by Article 6, global carbon credit trading will enable countries and companies to achieve more cost-effective and substantial greenhouse gas reductions, thereby encouraging more ambitious climate action plans.

[15] Kainou (2021), Collapse of the CDM Scheme under the Kyoto Protocol and Its Spillover: Consequences of 'Carbon Panic'.

The guidance on carbon offsetting

The guidance on carbon offsetting is essential to address concerns regarding the quality, integrity, and greenwashing risks associated with carbon credits. This chapter provides a summary of the guidance offered by relevant standards and frameworks.

Two key concerns arise when it comes to the proper use of carbon credits. Firstly, ensuring that carbon credits are of high quality and integrity. Secondly, using carbon credits in a way that reinforces climate action rather than postponing it. Fortunately, clear guidance exists to address both concerns.

The quality and integrity of carbon credits

It is fair to say that the carbon-crediting programs that in recent decades set the standards for voluntary carbon credits have been unsuccessful. Numerous instances of carbon credit projects exaggerating their emissions reduction achievements have been exposed by the media. For example, a recent investigation by the Guardian and Die Zeit about Verra, a leading voluntary carbon standard, revealed that 90% of their rainforest-related carbon credits may be 'phantom credits' that do not represent genuine emissions reductions.[16]

Recognizing the significance of the voluntary carbon market's size and its increasing importance in corporate climate strategies, market participants established the Integrity Council for the Voluntary Carbon Market (ICVCM) in 2021. The ICVCM's objective is to develop a new meta-standard, known as the Core Carbon Principles (CCP), to enhance confidence and comparability across the voluntary carbon market.[17] The CCP operates at two levels:

1. Carbon-crediting programs must meet four eligibility requirements to be CCP compliant. These requirements include effective program governance, the use of a registry for unique identification and tracking of carbon credits, transparent assessment and quantification of carbon credits, and robust third-party validation and verification.

2. Once a carbon-crediting program is deemed eligible, additional project-level analysis is required for approval of generated credits under the CCP.[18] This analysis considers six requirements, including additionality (emissions reductions would not have occurred without the incentive of carbon credit revenues), permanence (ensuring the durability of emissions reductions), robust quantification of emissions reductions, no double counting, sustainable development benefits and safeguards, and contribution to the net-zero transition.

It is important to note that while these requirements are not new, their enforcement through a more robust ICVCM governance system is a significant development. In the future voluntary carbon market, carbon-crediting programs and their projects will need to earn CCP approval, ensuring the quality of associated carbon credits and facilitating the scaling up of the voluntary carbon market.

Until the CCP standard is fully implemented, the voluntary carbon market continues to be dominated by over-the-counter trading. Prospective buyers must conduct due diligence themselves, scrutinizing the provider and quality of carbon offsets. Third-party rating agents that provide risk-based assessments of carbon projects can assist buyers in this process. However, proper due diligence into the quality of carbon credits remains a manual process requiring in-house expertise.[19]

The use of carbon credits in net-zero strategies

The second major concern regarding carbon credits is their use as a means to delay genuine decarbonization efforts. Instead of reducing emissions through green technologies or low-carbon products, businesses may rely on offsetting to maintain the status quo, claiming emissions reductions achieved elsewhere.

Clear guidance exists to mitigate this risk, known as the mitigation hierarchy. The mitigation hierarchy, embedded in leading net-zero standards for corporates and investors, prioritizes steps such as avoiding and reducing adverse impacts before compensating and restoring impacts. The hierarchy provides a sequence of actions for corporates and investors:

1. Abate: The primary focus should be on rapidly and significantly reducing greenhouse gas emissions in line with scientific targets – halving emissions by 2030 and achieving net-zero emissions by 2050. Investors should prioritize these objectives in their investment and stewardship activities.

2. Compensate: While decarbonizing their activities, corporates and investors should support emissions reductions or removals in other areas of the economy to compensate for their remaining emissions. This 'beyond value chain mitigation' should be

16 Source: https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe
17 https://icvcm.org/
18 Ibid.
19 See for example the Buyer's Guide to Natural Climate Solution Carbon Credits issued by the World Business Council for Sustainable Development (WBCSD).

additional to ongoing decarbonization efforts. While the use of carbon credits for compensation is encouraged, it may not contribute to net-zero emissions reductions.

3. Neutralize: Once decarbonization efforts reach a certain point where further emissions reductions become challenging, any remaining emissions should be offset through permanent emissions removals elsewhere in the economy. The definition of residual emissions is not yet standardized. However, scenarios from the International Panel on Climate Change suggest that in a future net-zero economy, residual emissions may range from 5 to 10 Gt of CO2e per annum. This highlights the potential for a significant market for carbon dioxide removal technologies, including nature-based and technological solutions.[20] As a rule of thumb, the Science-Based Targets Initiative suggests that a company should reduce its absolute emissions by 90% before considering neutralization, which effectively postpones neutralization for the next five to ten years. Once relevant, investors are expected to encourage portfolio companies to neutralize their residual emissions and invest directly in carbon removal activities.

The mitigation hierarchy effectively ensures that carbon credits are used in a complementary manner to accelerate climate action rather than as a means to postpone it. Buyers must continue decarbonizing their own operations while contributing to climate mitigation efforts elsewhere in the economy.

Box 4. Carbon-neutral versus net zero

When using carbon credits, it's important to understand the distinction between two terms: carbon neutral and net zero.

Carbon neutral refers to a specific part of business operations or particular products and services, such as an investment strategy. It is a claim that requires validation or certification. The leading standard for carbon neutrality is PAS 2060, developed by the British Standards Institution. An international standard for carbon neutrality (ISO 14068) is currently being developed. Companies and investors can develop carbon-neutral products that are certified against these standards.

On the other hand, net zero is a claim at the entity level. It means that a company aims to reduce all greenhouse gas emissions across its entire supply chain and offset any remaining emissions through carbon removal. While carbon neutral focuses on Scope 1 and 2 emissions, net zero extends its scope to include Scope 3 emissions when they account for more than 40% of a company's footprint. Net zero cannot be certified against a standard, but is based on frameworks such as the Science-Based Targets initiative or the Net Zero Investment Framework.

Net zero has a much broader scope than carbon neutral, encompassing a company's overall business activities and emissions they generate. A company or investor can work towards achieving net-zero emissions in the long run while simultaneously developing specific certified carbon-neutral products and services along the way. However, carbon-neutrality claims are under increasing scrutiny by civil society and public authorities, prompting several market participants to refrain from further usage of such claims.

[20] IPCC (2018), Global warming of 1.5 degrees, special report.

The role of investors

If carbon markets are essential for achieving a net-zero economy, then what action can investors take to support their development? This chapter explores three roles that investors can consider in this regard.

Carbon markets as an asset class

While investor participation in carbon markets is currently limited, the market landscape is evolving and carbon markets are increasingly being seen as an investable asset class.[21] Investors can explore opportunities in compliance markets, voluntary markets, and private assets.

Compliance markets, such as those in the European Union, the United Kingdom, California, and the Regional Greenhouse Gas Initiative in the United States,[22] offer avenues for participation through auctions, physical certificates, or futures contracts. Research indicates that carbon markets exhibit a low correlation with conventional assets like stocks, bonds, and commodities, providing diversification opportunities.[23] However, challenges persist, including limited market depth, pricing volatility influenced by policy changes, and reputational risks associated with political sensitivities.

Voluntary markets are currently not viable for mainstream investment, due to limited liquidity, insufficient market size, a non-standardized transaction process, and opaque price mechanisms. In recent years, new players entered the market to enhance trading and investment, such as carbon exchanges and carbon rating agents. Furthermore, as highlighted in the previous chapter, voluntary carbon markets are expected to improve as the Integrity Council implements its proposed market governance. But as long as concerns about quality and integrity of carbon credits persist, voluntary carbon trading will be dominated by over-the-counter transactions that makes it largely unattractive as an asset class.

Finally, investors can consider investments in private assets with carbon removal capacity. Such assets include companies operating in timber, agriculture, negative emission technologies, environmental remediation, wetland management, amongst others. An increasing number of investment products focuses on nature-based solutions or technology start-ups, seeking to profit from the growth of these new business models and a share the carbon credits they generate. Such strategies however are still only a small market segment.

Climate policy will remain the key underlying driver for growth of investment opportunities in carbon markets. In particular, implementation of Article 6 of the Paris Agreement will determine the potential fungibility of compliance and voluntary carbon markets and the real economic and financial importance of carbon markets world-wide.

Support to climate solutions

Investors can approach carbon markets with a strategy aligned with net-zero policy goals. The mitigation hierarchy guides investors to prioritize decarbonizing their portfolios in line with scientific targets. As they decarbonize, investors can consider (partial) compensation for their remaining emissions by purchasing carbon credits and supporting climate mitigation efforts beyond their investments. This compensatory effort does not count towards portfolio decarbonization. Climate science and policy developments emphasize the importance of directing capital to emerging markets and developing economies, where emissions are still rising. It is a shared responsibility, including for industrialized countries, to contribute to climate mitigation beyond their own boundaries. Companies and investors in industrialized countries should look beyond reducing their own emissions and seek to contribute to climate solutions benefitting society at large.

While net-zero investment frameworks recognize the mitigation hierarchy, they do not provide specific guidance on how and to what extent investors should deploy compensation. Two starting points can be considered:

- Make compensation applicable to climate-aligned investment strategies, such as Paris-Aligned benchmarks, Climate Transition benchmarks or equivalent approaches that ensure annual decarbonization in line with climate science. This approach lives up to the mitigation hierarchy, prioritizing abatement efforts and using compensation as a complementary measure.
- Let compensation follow the logic of carbon neutrality by focusing on the Scope 1 and 2 emissions of portfolios rather than the Scope 3 emissions. Scope 3 emissions are more prone to double-counting and data issues, while standards for carbon neutrality, such as PAS 2060, primarily address Scope 1 and 2 emissions.

21 GIC, EBD and McKinsey (2021), Putting carbon markets to work on the path to net zero.
22 Source: Swinkels and Yang (2022), Investing in carbon credits.
23 Ibid.

Box 5. Carbon offset charge for a share class

Robeco has recently introduced carbon offsetting share classes in several climate investment strategies to offset the financed Scope 1 and 2 emissions through a carbon offset charge, which is calculated on a quarterly basis and is in addition to the standard fees for investors in the share class. The following example outlines the methodology used to determine this charge.

Assumptions:
- The total financed emissions for a quarter are 2,500 metric tons of CO2e, calculated based on the portfolio holdings and their carbon footprints.
- The market price of carbon offset is USD 20 per metric ton of CO2e
- The size of the share class is USD 100 million.

Step 1: Calculate carbon offset cost: Total financed emissions * Cost of carbon offset = 2,500 metric tons * USD 20/metric ton = USD 50,000

Step 2: Calculate additional fee: (Total cost of carbon offset/Net Asset Value (NAV)) * 10,000 = (USD 50,000/USD 100,000,000) * 10,000 = 5 basis points (bps)

Therefore, to offset financed emissions for a quarter, an additional 5 bps charge would be applied to the NAV of the share class. The carbon offset charge is periodically reassessed to align with market fluctuations in carbon offset prices, ensuring that the share class effectively offsets its emissions.

Company engagement

As the use of carbon offsets by corporations increases, so does the need for transparency and accountability in their use to avoid greenwashing. It is crucial for investors to develop and communicate clear guidance to the companies they invest in, ensuring the credible and responsible use of carbon credits.

The Climate Action 100+ initiative, which comprises over 300 institutional investors, has expanded the Net Zero Benchmark to include criteria on carbon offset disclosures. These criteria drive the engagement agenda for assessing the climate performance of the world's top emitters. The added criteria focus on the following elements:

- Following the mitigation hierarchy, with abatement taking priority and offsetting being considered as a complementary measure.
- Acknowledging that offsets should not count towards companies' science-based emissions reduction targets.
- Prioritizing the use of high-integrity and high-quality carbon offsets, with an emphasis on long-lived carbon removal.
- Requiring companies to disclose the type of offsets used and their role in the overall transition strategy.

As an active member of Climate Action 100+, Robeco is dedicated to incorporating the guidance from net-zero standards in our engagement activities. By doing so, we aim to enhance transparency around the use of carbon offsets and improve our ability to assess the credibility and integrity of companies' climate targets and decarbonization strategies.

Our conclusion

Carbon markets are experiencing growth, but investment opportunities are still limited and risks remain significant. However, it is essential for investors to actively engage with carbon markets, as they are a fundamental pillar of the future net-zero economy.

While recent media coverage has linked carbon offsetting to greenwashing, at Robeco, we recognize the risks but firmly believe that disengagement is not the solution. Instead, we must work towards making carbon markets effective.

Economists universally agree on the importance of carbon markets in driving the transition to a net-zero economy. This necessitates the engagement of long-term vision investors committed to sustainable value creation. Based on our review of relevant standards, we outline the following key points:

1. Investors should prioritize decarbonizing their portfolios in alignment with scientific targets, aiming for a 7% decarbonization pathway year on year.
2. While decarbonizing, investors should compensate for their financed emissions by supporting climate solutions elsewhere in the economy, including through the use of carbon credits. However, this compensation effort does not count towards portfolio decarbonization.
3. Investors should conduct thorough due diligence when sourcing carbon credits, ensuring that both the carbon credit provider and the underlying carbon projects adhere to the quality and integrity requirements outlined in the Core Carbon Principles.
4. Investors should engage with their investee companies to promote the proper use of carbon credits in line with the mitigation hierarchy and carbon quality standards.

As carbon markets continue to evolve, they will become an increasingly important asset class. Compliance markets are already investable, and as governments fulfil their climate targets, these markets will grow in scale and depth. Voluntary carbon markets will undergo governance improvements, transitioning from over-the-counter transactions to exchange-based trading at scale. The implementation of Article 6 of the Paris Agreement will further intertwine both types of markets.

By engaging now, even on a small scale, net-zero investors can develop valuable expertise and prepare for the significant role carbon markets will play in the global economy. Moreover, active engagement allows investors to contribute to the development and effectiveness of carbon markets. Carbon markets are recognized as powerful to accelerate climate action, and with cautious operation, investors can fulfil their role in making carbon markets work.

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Additional information for investors with residence or seat in Austria

This information is solely intended for professional investors or eligible counterparties in the meaning of the Austrian Securities Oversight Act.

Additional information for investors with residence or seat in Brazil

The Fund may not be offered or sold to the public in Brazil. Accordingly, the Fund has not been nor will be registered with the Brazilian Securities Commission (CVM), nor has it been submitted to the foregoing agency for approval. Documents relating to the Fund, as well as the information contained therein, may not be supplied to the public in Brazil, as the offering of the Fund is not a public offering of securities in Brazil, nor may they be used in connection with any offer for subscription or sale of securities to the public in Brazil.

Additional information for investors with residence or seat in Brunei

The Prospectus relates to a private collective investment scheme which is not subject to any form of domestic regulations by the Autoriti Monetari Brunei Darussalam ("Authority"). The Prospectus is intended for distribution only to specific classes of investors as specified in section 20 of the Securities Market Order, 2013, and must not, therefore, be delivered to, or relied on by, a retail client. The Authority is not responsible for reviewing or verifying any prospectus or other documents in connection with this collective investment scheme. The Authority has not approved the Prospectus or any other associated documents nor taken any steps to verify the information set out in the Prospectus and has no responsibility for it. The units to which the Prospectus relates may be illiquid or subject to restrictions on their resale. Prospective purchasers of the units offered should conduct their own due diligence on the units.

Additional information for investors with residence or seat in Canada

No securities commission or similar authority in Canada has reviewed or in any way passed upon this document or the merits of the securities described herein, and any representation to the contrary is an offence. Robeco Institutional Asset Management B.V. relies on the international dealer and international adviser exemption in Quebec and has appointed McCarthy Tétrault LLP as its agent for service in Quebec.

Additional information for investors with residence or seat in the Republic of Chile

Neither Robeco nor the Funds have been registered with the Comisión para el Mercado Financiero pursuant to Law no. 18.045, the Ley de Mercado de Valores and regulations thereunder. This document does not constitute an offer of or an invitation to subscribe for or purchase shares of the Funds in the Republic of Chile, other than to the specific person who individually requested this information on their own initiative. This may therefore be treated as a "private offering" within the meaning of Article 4 of the Ley de Mercado de Valores (an offer that is not addressed to the public at large or to a certain sector or specific group of the public).

Additional information for investors with residence or seat in Colombia

This document does not constitute a public offer in the Republic of Colombia. The offer of the fund is addressed to less than one hundred specifically identified investors. The fund may not be promoted or marketed in Colombia or to Colombian residents, unless such promotion and marketing is made in compliance with Decree 2555 of 2010 and other applicable rules and regulations related to the promotion of foreign funds in Colombia. The distribution of this Prospectus and the offering of Shares may be restricted in certain jurisdictions. The information contained in this Prospectus is for general guidance only, and it is the responsibility of any person or persons in possession of this Prospectus and wishing to make application for Shares to inform themselves of, and to observe, all applicable laws and regulations of any relevant jurisdiction. Prospective applicants for Shares should inform themselves of any applicable legal requirements, exchange control regulations and applicable taxes in the countries of their respective citizenship, residence or domicile.

Additional information for investors with residence or seat in the Dubai International Financial Centre (DIFC), United Arab Emirates
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Additional information for investors with residence or seat in France
Robeco Institutional Asset Management B.V. is at liberty to provide services in France. Robeco France is a subsidiary of Robeco whose business is based on the promotion and distribution of the group's funds to professional investors in France.

Additional information for investors with residence or seat in Germany
This information is solely intended for professional investors or eligible counterparties in the meaning of the German Securities Trading Act.

Additional information for investors with residence or seat in Hong Kong
The contents of this document have not been reviewed by the Securities and Futures Commission ("SFC") in Hong Kong. If there is any doubt about any of the contents of this document, independent professional advice should be obtained. This document has been distributed by Robeco Hong Kong Limited ("Robeco"). Robeco is regulated by the SFC in Hong Kong.

Additional information for investors with residence or seat in Indonesia
The Prospectus does not constitute an offer to sell nor a solicitation to buy securities in Indonesia.

Additional information for investors with residence or seat in Italy
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Additional information for investors with residence or seat in South Korea
The Management Company is not making any representation with respect to the eligibility of any recipients of the Prospectus to acquire the Shares therein under the laws of South Korea, including but not limited to the Foreign Exchange Transaction Act and Regulations thereunder. The Shares have not been registered under the Financial Investment Services and Capital Markets Act of Korea, and none of the Shares may be offered, sold or delivered, or offered or sold to any person for re-offering or resale, directly or indirectly, in South Korea or to any resident of South Korea except pursuant to applicable laws and regulations of South Korea.

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Additional information for investors with residence or seat in Malaysia
Generally, no offer or sale of the Shares is permitted in Malaysia unless where a Recognition Exemption or the Prospectus Exemption applies: NO ACTION HAS BEEN, OR WILL BE, TAKEN TO COMPLY WITH MALAYSIAN LAWS FOR MAKING AVAILABLE, OFFERING FOR SUBSCRIPTION OR PURCHASE, OR ISSUING ANY INVITATION TO SUBSCRIBE FOR OR PURCHASE OR SALE OF THE SHARES IN MALAYSIA OR TO PERSONS IN MALAYSIA AS THE SHARES ARE NOT INTENDED BY THE ISSUER TO BE MADE AVAILABLE, OR MADE THE SUBJECT OF ANY OFFER OR INVITATION TO SUBSCRIBE OR PURCHASE, IN MALAYSIA. NEITHER THIS DOCUMENT NOR ANY DOCUMENT OR OTHER MATERIAL IN CONNECTION WITH THE SHARES SHOULD BE DISTRIBUTED, CAUSED TO BE DISTRIBUTED OR CIRCULATED IN MALAYSIA. NO PERSON SHOULD MAKE AVAILABLE OR MAKE ANY INVITATION OR OFFER OR INVITATION TO SELL OR PURCHASE THE SHARES IN MALAYSIA UNLESS SUCH PERSON TAKES THE NECESSARY ACTION TO COMPLY WITH MALAYSIAN LAWS.

Additional information for investors with residence or seat in Mexico
The funds have not been and will not be registered with the National Registry of Securities or maintained by the Mexican National Banking and Securities Commission and, as a result, may not be offered or sold publicly in Mexico. Robeco and any underwriter or purchaser may offer and sell the funds in Mexico on a private placement basis to Institutional and Accredited Investors, pursuant to Article 8 of the Mexican Securities Market Law.

Additional information for investors with residence or seat in Peru
The Superintendencia del Mercado de Valores (SMV) does not exercise any supervision over this Fund and therefore the management of it. The information the Fund provides to its investors and the other services it provides to them are the sole responsibility of the Administrator. This Prospectus is not for public distribution.

Additional information for investors with residence or seat in Singapore
This document has not been registered with the Monetary Authority of Singapore ("MAS"). Accordingly, this document may not be circulated or distributed directly or indirectly to persons in Singapore other than (i) to an institutional investor under Section 304 of the SFA, (ii) to a relevant person pursuant to Section 305(1), or any person pursuant to Section 305(2), and in accordance with the conditions specified in Section 305, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA. The contents of this document have not been reviewed by the MAS. Any decision to participate in the Fund should be made only after reviewing the sections regarding investment considerations, conflicts of interest, risk factors and the relevant Singapore selling restrictions (as described in the section entitled "Important information for Singapore Investors") contained in the prospectus. Investors should consult their professional adviser if you are in doubt about the stringent restrictions applicable to the use of this document, regulatory status of the Fund, applicable regulatory protection, associated risks and suitability of the Fund to your objectives. Investors should note that only the Sub-Funds listed in the appendix to the section entitled "Important information for Singapore Investors" of the prospectus ("Sub-Funds") are available to Singapore investors. The Sub-Funds are notified as restricted foreign schemes under the Securities and Futures Act, Chapter 289 of Singapore ("SFA") and invoke the exemptions from compliance with prospectus registration requirements pursuant to the exemptions under Section 304 and Section 305 of the SFA. The Sub-Funds are not authorized or recognized by the MAS and shares in the Sub-Funds are not allowed to be offered to the retail public in Singapore. The prospectus of the Fund is not a prospectus as defined in the SFA. Accordingly, statutory liability under the SFA in relation to the content of prospectuses does not apply. The Sub-Funds may only be promoted exclusively to persons who are sufficiently experienced and sophisticated to understand the risks involved in investing in such schemes, and who satisfy certain other criteria provided under Section 304, Section 305 or any other applicable provision of the SFA and the subsidiary legislation enacted thereunder. You should consider carefully whether the investment is suitable for you. Robeco Singapore Private Limited holds a capital markets services license for fund management issued by the MAS and is subject to certain clientele restrictions under such license.

Additional information for investors with residence or seat in Spain
Robeco Institutional Asset Management B.V., Sucursal en España with identification number W0032687F and having its registered office in Madrid at Calle Serrano 47-14º, is registered with the Spanish Commercial Registry in Madrid, in volume 19.957, page 190, section 8, sheet M-351927 and with the National Securities Market Commission (CNMV) in the Official Register of branches of European investment services companies, under number 24. The investment funds or SICAV mentioned in this document are regulated by the corresponding authorities of their country of origin and are registered in the Special Registry of the CNMV of Foreign Collective Investment Institutions marketed in Spain.

Additional information for investors with residence or seat in South Africa
Robeco Institutional Asset Management B.V. is registered and regulated by the Financial Sector Conduct Authority in South Africa.

Additional information for investors with residence or seat in Switzerland
The Fund(s) are domiciled in Luxembourg. This document is exclusively distributed in

Switzerland to qualified investors as defined in the Swiss Collective Investment Schemes Act (CISA). This material is distributed by Robeco Switzerland Ltd, postal address: Josefstrasse 218, 8005 Zurich. ACOLIN Fund Services AG, postal address: Leutschenbachstrasse 50, 8050 Zürich, acts as the Swiss representative of the Fund(s). UBS Switzerland AG, Bahnhofstrasse 45, 8001 Zurich, postal address: Europastrasse 2, P.O. Box, CH-8152 Opfikon, acts as the Swiss paying agent. The prospectus, the Key Information Documents (PRIIP), the articles of association, the annual and semi-annual reports of the Fund(s), as well as the list of the purchases and sales which the Fund(s) has undertaken during the financial year, may be obtained, on simple request and free of charge, at the office of the Swiss representative ACOLIN Fund Services AG. The prospectuses are also available via the website.

Additional information relating to RobecoSAM-branded funds/services
Robeco Switzerland Ltd, postal address Josefstrasse 218, 8005 Zurich, Switzerland has a license as asset manager of collective assets from the Swiss Financial Market Supervisory Authority FINMA. The RobecoSAM brand is a registered trademark of Robeco Holding B.V. The brand RobecoSAM is used to market services and products which entail Robeco's expertise on Sustainable Investing (SI). The brand RobecoSAM is not to be considered as a separate legal entity.

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Additional information for investors with residence or seat in Thailand
The Prospectus has not been approved by the Securities and Exchange Commission which takes no responsibility for its contents. No offer to the public to purchase the Shares will be made in Thailand and the Prospectus is intended to be read by the addressee only and must not be passed to, issued to, or shown to the public generally.

Additional information for investors with residence or seat in the United Arab Emirates
Some Funds referred to in this marketing material have been registered with the UAE Securities and Commodities Authority ("the Authority"). Details of all Registered Funds can be found on the Authority's website. The Authority assumes no liability for the accuracy of the information set out in this material/document, nor for the failure of any persons engaged in the investment Fund in performing their duties and responsibilities.

Additional information for investors with residence or seat in the United Kingdom
Robeco is deemed authorized and regulated by the Financial Conduct Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorization, are available on the Financial Conduct Authority's website.

Additional information for investors with residence or seat in Uruguay
The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except under circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated 27 September 1996, as amended.