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GETTING TO NET-ZERO

THE VITAL ROLE OF GLOBAL CARBON MARKETS

REPORT PREPARED FOR INSTITUTE OF INTERNATIONAL FINANCE



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FINANCE

FOREWORD

Climate change is the defining challenge of our time. Now, in 2021, the IPCC has confirmed that many climate-related impacts and damages are unavoidable, even at our current level of 1.1°C of global warming since the pre-industrial period. What's more, thanks to advancements in technical modelling, we have a much more detailed, granular and harrowing view of what life in a future of dangerous climate change could look like – massive storms, fires, extinctions and ecosystem collapse. Catastrophic climate change must be avoided at all costs, which requires us to employ all the tools at our disposal—including the power of global financial markets to support net-zero goals.

It is widely recognized that putting a price on carbon is one of the most impactful tools we have to drive economic change that can help address the risks of climate change. Carbon pricing can be accomplished through regulated compliance markets like emissions trading schemes (ETS), through the introduction of market instruments like carbon taxes, and via carbon credits traded through voluntary carbon markets. Momentum behind these ideas is building—from the introduction of new regulated schemes in countries like China, to the work of the G20 to promote global consensus on carbon pricing, to the work of the Taskforce on Scaling Voluntary Carbon Markets, an IIF-sponsored initiative which via a newly formed governance body is developing a global benchmark standard for carbon credit quality.

Perhaps the most significant progress towards net-zero is happening in the private sector – in 2020, 1,565 businesses had made commitments to align their businesses with the emissions pathway of a low-carbon future.¹ As companies, sectors, and governments around the world commit to

net-zero, in line with frameworks developed by entities like the Science-based Targets Initiative (SBTi) and the Glasgow Financial Alliance for Net-zero (GFANZ), we will have to collaboratively decide what role carbon credits play in delivering the 'Net', alongside the 'Zero'—ensuring that decarbonization comes first, and that credits are used only as a last-resort solution.

At the global level, there is tremendous potential to apply the logic of carbon markets to the international coordination challenge of climate mitigation. The world is looking to the UNFCCC COP26 conference for not only more ambitious Nationally Determined Contributions (NDCs) from governments, but also for progress on these market infrastructures – including under Article 6 of the Paris agreement. Going forward, a well-functioning global regulated market for international mitigation transfers will be a critical component of the global climate architecture—with important implications for how countries, and the private sector, engage and transact through the patchwork quilt of regulated and voluntary schemes currently in place.

We think that the 2020s can be the “decade of carbon markets”—so with support and analysis from Vivid Economics, the IIF produced this report to help shed light on the most important and complex questions about how global carbon markets—regulated and voluntary – can help to deliver net-zero.

TIM ADAMS

President and CEO
Institute of International Finance

1. This only includes net-zero targets.

EXECUTIVE SUMMARY

Carbon markets are expanding rapidly, as governments, companies and financial institutions increasingly commit to achieving net-zero greenhouse gas (GHG) emissions targets. Over 70% of global economic activity occurs in countries with net-zero emissions targets. Many of these countries use compliance carbon markets (“compliance markets”),² which now cover 21% of global emissions, up from 11% in 2015. Beyond the jurisdictional level, companies are increasingly committing to net-zero emissions, by reducing direct and supply-chain emissions where feasible, and neutralizing for residual emissions with emissions removals and storage, through the purchase of high-quality carbon credits through voluntary carbon markets (“voluntary markets”), which operate in parallel to compliance schemes. Corporate initiatives such as The Climate Pledge and the UN Race to Zero campaign are gaining traction in boardrooms, alongside financial sector counterparts such as the Net-zero Asset Owners Alliance. In 2020, 1,565 companies had a net-zero target in place, double the commitments from the previous year.³

In the coming decade every major business is likely to interact with carbon markets in some

way. Many businesses currently have limited experience as active participants in carbon markets. Many also operate in sectors not covered by compliance carbon markets, while others have yet to make voluntary commitments⁴. As momentum for decarbonization grows, more businesses are expected to adopt **carbon neutral** (unavoidable emissions are compensated or neutralized within a given year) or **net-zero** (a state of no net impact from GHG emissions, with any residual emissions neutralized with carbon removals) targets in the next decade.^{5,6}

If the 2020s are the decade where carbon markets realize their potential, coverage could reach over half of global emissions by 2030.

Continued expansion of both compliance and voluntary carbon markets could see coverage more than double, from 24% of global emissions today, up to 52% of global emissions in 2030 (see Figure 1).⁷ Compliance market coverage could expand from 21% today to 47% in 2030, and voluntary market commitments could grow from covering 9% of corporate emissions today to

2. Oxford Net-zero (2021): [Taking Stock: A global assessment of net-zero targets](#). Note: statistic reflects additional net-zero commitments from the Russian Federation and Turkey since the report's release
3. New Climate Institute (2020): [“Navigating the nuances of net-zero targets”](#)
4. Nearly 80% of the world's 2,000 largest public companies not yet formally net-zero commitments.
5. Energy & Climate Intelligence Unit and Oxford Net-zero Project (2021): [“Taking Stock: A Global Assessment of Net-zero Commitments”](#)
6. Though there is still no consensus on these definitions, it is generally agreed that carbon neutrality is achieved when unavoidable emissions are compensated or neutralized within a given year using any type of carbon credits. A net-zero claim requires reaching a state of no impact on the climate from GHG emissions, with all residual emissions to be neutralized with the permanent removal and storage of GHG emissions (not emission reductions). This paper refers to these various company commitments as “decarbonization targets”.
7. For more information on the methodology for projected carbon market growth, see Annex: Methodology

FIGURE 10

BUILDING TAILWINDS FOR NET-ZERO CONSISTENT CARBON MARKETS

Source: Vivid Economics graphic

Across these four factors “end to end” transparency is essential. This is especially the case for voluntary markets where disclosure is not required under regulation. It begins with transparency from companies about their decarbonization target and the role credits will play in achieving that goal (**claims**). Second, transparency from market participants about the credits that are purchased and their price (**ownership**), and the impacts that they generate on the ground (**impacts**). Finally, transparent accounting within markets demonstrates that double counting has been avoided when those

credits are used to fulfil a target (**accounting**). This section elaborates how transparency impacts each of these key factors.

Rapid growth of carbon markets is achievable, but so is a future where progress is limited. An **Expansionary outlook** fully realizes the potential growth by advancing across all key factors, with a virtuous cycle of progress. In a **Constrained outlook**, carbon markets are still an important component of the policy mix and corporate response, and could continue expanding, but fail to reach their full growth potential. The outlook under each scenario is summarized in Table 5.

TABLE 5

KEY FACTOR DEVELOPMENTS UNDER EXPANSIONARY AND CONSTRAINED SCENARIO

KEY FACTOR	EXPANSIONARY OUTLOOK	CONSTRAINED OUTLOOK
Demand	Compliance carbon markets align emissions caps (or carbon prices) with achieving net-zero emissions by mid-century and increase sector coverage. Decarbonization commitments become standard for major companies	Reduced ambition restricts growth in compliance markets and complementary policies. Voluntary markets continue to grow, but they do not fill gaps in market coverage
Integrity	Across compliance and voluntary markets, a consensus emerges on what constitutes demand- and supply- side integrity. This focuses carbon credit growth on priority sectors where the highest impact can occur	A patchwork of standards and criteria creates confusion for market participants about acceptable approaches, particularly within voluntary markets
Infrastructure	New market participants benefit from transparent registries and recognized standard contracts that reduce transaction costs and ease the process for buyers and sellers	Continued inconsistency of contracts across standards and markets. New entrants must familiarize themselves with multiple approaches to build a diversified credit portfolio
Accounting (Article 6)	Article 6.2 facilitates international carbon market transfers. Private sector transactions dominate. The Article 6.4 Mechanism simplifies carbon credit development, particularly in least developed countries	Unclear guidance inhibits rapid growth in carbon market transfers. Government bilateral ITMO ⁸¹ transfers mobilize emission reductions as a substitute for carbon market transfers. The Article 6.4 Mechanism is challenging for project developers to navigate

Source: Vivid Economics

Scaling carbon markets to achieve net-zero will not occur automatically. It will require mobilizing demand for high-integrity mitigation, enabled by efficient market infrastructure and robust accounting. Steps can be taken to enhance

carbon markets across each of these fronts, with a potential virtuous cycle where advances in compliance markets open opportunities for greater demand for voluntary market credits, and vice versa.

81. Internationally Transferred Mitigation Outcomes (ITMOs) refer to the trading units under article 6 of the Paris Agreement, they are discussed further in section 2.

DEMAND

Scaling up compliance and voluntary markets ultimately requires ratcheted ambition to unlock greater demand. Compliance markets cover over one-fifth of global GHG emissions, but this coverage would need to continue to increase rapidly over the coming decade to provide a market signal across global industries. As noted by the TSVCM, voluntary credits need to expand by as much as fifteen times current levels to reach a scale commensurate with net-zero emissions by mid-century.⁸²

Voluntary and compliance carbon markets are each necessary but not sufficient to meet net-zero emissions. The increase in demand for voluntary market credits and compliance market coverage would need to occur. If carbon markets are a part of the tool mix to meet climate commitments, then more ambitious targets imply a greater need for both compliance and voluntary markets. However, it is important not to overlook the important role for complementary policies and private incentives aside from carbon markets that mobilize emission reductions across the global economy.

Achieving the Paris Agreement's goals requires ratcheting ambition from countries, which could generate demand for new compliance markets. This potential new role could take three forms. First, compliance markets could be established in new geographies (such as members of the World Bank PMI). Second, existing ETSs could expand to cover new sectors and tighten the caps on existing sectors, as the European Commission recently proposed in its Fit for 55 policy package. Third, compliance markets could formally link across jurisdictions. Across these three options for ratcheting carbon markets alongside ratcheting ambition through enhanced NDCs, prices can be

elevated to align with the High-Level Commission on Carbon Prices.⁸³

Ratcheting voluntary market demand will be driven by an acceleration of net-zero commitments to more companies and more ambitious deadlines. The aim is a positive “race to net-zero” where the impact of corporate commitments grows in two ways. First, commitments broaden across companies, investors and other private actors so that a decarbonization commitment becomes standard business practice. These commitments would take the form of transparent claims, as detailed in section 4.2. This includes increased commitments from existing voluntary market buyers and investments from new entrants globally. Second, those with an existing net-zero commitment can ratchet their ambition to reach that goal earlier, following the lead of initiatives such as The Climate Pledge to reach net-zero by 2040. Net-zero commitments should be expected to follow the mitigation hierarchy (prioritizing the internal abatement of emissions over the purchase of carbon credits). The High Ambition Path to Net-Zero offers a helpful guide for companies and investors to examine the practical role voluntary markets can play in achieving ambitious targets.⁸⁴

The ratcheting of ambition in compliance and voluntary markets can create a virtuous cycle enabling more rapid action. Policy to accelerate action at a jurisdictional level can help reduce the cost of adopting more ambitious voluntary targets. Ambitious compliance markets drive down the costs of green technologies for businesses to adopt, which in turn makes a more ambitious net-zero commitment more economically feasible for businesses. This could entail either committing to reach a decarbonization target earlier or including a new category of emissions (such as Scope 3 emissions) under an existing commitment.

Conversely, private sector efforts to reach net-zero early could encourage policymakers to align their decarbonization targets with businesses operating in their jurisdiction.

The recent growth in both compliance and voluntary markets demonstrates that there is a greater demand signal for both approaches (see Section 2.1). Greater demand is the end point of the pathway to scaled-up voluntary and compliance markets commensurate with achieving net-zero emissions. The challenge, however, is to develop the enabling factors that give governments and the private sector the confidence, tools and infrastructure to commit to scaling up carbon markets.

INTEGRITY

Carbon markets are only valuable if they uphold integrity. Integrity encompasses both the supply and demand sides of carbon markets:

- **Supply-side integrity** occurs when emission reductions are real and verified. This incorporates robust methodologies for addressing issues such as additionality, permanence, leakage, accurate GHG measurements, and double counting.⁸⁵
- **Demand-side integrity** is fulfilled if buyers of voluntary market credits and governments establishing compliance markets align carbon markets with credible and comprehensive climate commitments.

There are multilateral initiatives working to enhance supply-side integrity that are coalescing behind best-practice design acquired through past experiences. Initiatives such as the World Bank PMI can assist developing countries to design

effective compliance markets.⁸⁶ At the international level, multilateral initiatives such as the San Jose Principles, a 32-country pledge to high integrity carbon market cooperation, highlights a common goal of international transfers that aim to mitigate integrity concerns.⁸⁷ In voluntary markets, efforts of the TSVCM, the International Carbon Reduction and Offset Alliance (ICROA) and the Carbon Credit Quality Initiative will also be important to define a common integrity standard (see Figure 11).⁸⁸ For example, the TSVCM is establishing the Core Carbon Principles (CCP) overseen by a Governance Body to act as a threshold standard to identifying high-quality carbon credits. Regarding any claimed co-benefits, supply-side integrity will also benefit from increasing transparency on the actual impact of the crediting projects in the country of implementation. This will streamline trading by allowing market entrants to trade in high quality products without the need for significant expertise nor due diligence.

82. TSVCM (2021)

83. Carbon Pricing Leadership Coalition (2017) [Report of the High-Level Commission on carbon prices](#)

84. Institute of International Finance (IIF): [Calling for a High Ambition Path to Net-Zero](#)

85. For more information on principles for supply-side integrity, see VCM (2021) [Aligning Voluntary Carbon Markets with the 1.5 °C Paris Agreement Ambition](#)

86. See the World Bank's [Partnership for Market Implementation website](#)

87. Government of Costa Rica (2019) [Press release: 32 leading countries set benchmark for carbon markets with San Jose Principles](#)

88. International Carbon Reduction and Offset Alliance

There are also initiatives working to enhance demand-side integrity by building consensus around standardized decarbonization claims for companies involved in the voluntary market. It is essential that companies are transparent about their decarbonization target and the role credits will play in achieving that goal. With a plethora of decarbonization claims in existence today (e.g., carbon neutral, climate neutral, climate negative, net-zero, etc.), some companies' claims are complex to interpret. This could increase the reputational risk of perceived greenwashing. The VCMI is currently developing guidance on ensuring demand-side integrity, for example.⁸⁹ This is related but separate to whether a proposed pathway is commensurate with achieving net-zero emissions. Initiatives such as Science-Based Target Initiative (SBTi) go further by establishing specific pathways with interim targets to assess corporate climate ambition.

FIGURE 11
INITIATIVES AND CHARTERS ESTABLISHED TO ELABORATE HIGH-INTEGRITY PRACTICES



Sources: [TSVCM](#), [VCMI](#), [ICROA](#), [The Carbon Credit Quality Initiative](#)

89. Standards include PAS 2060, Certified Carbon Neutral, VCMI

Nevertheless, there is a lack of consensus regarding the use of carbon credits for corporate decarbonization claims. Under some initiatives the use of credits is permitted whereas in others it is discouraged or even banned. Given the important role of financial institutions in driving corporate climate ambition, building a common framework for these claims will be critical to avoid confusion that deters companies from announcing ambitious targets. The range of existing approaches are summarized in Table 6.

TABLE 6
USE OF CREDITING IN SELECTED NET-ZERO INITIATIVES IN THE FINANCE SECTOR

INITIATIVE	TREATMENT OF CREDITING
Race to Zero ⁹⁰	Permitted. Reducing emissions should be prioritized, limiting credit use for residual emissions.* By the time net-zero status is achieved, any neutralization of residual emissions must transition to permanent removals.
UN-Convened Net-Zero Banking Alliance ^{**91}	Permitted to supplement decarbonization in line with climate science. Only removal carbon credits can be used to neutralize residual emissions at net-zero.
UN-convened Net-Zero Insurance Alliance ^{**92}	Permitted to supplement decarbonization in line with climate science. Only removal carbon credits can be used to neutralize residual emissions at net-zero.
Net-zero Asset Manager Initiative ^{**93}	Permitted. Signatories commit to prioritize the achievement of real economy emissions reductions within the sectors and companies in which they invest. If using credits, they commit to invest in long-term carbon removal.

- 90. Race To Zero is a global campaign mobilizing a coalition of leading net-zero initiatives, representing 733 cities, 31 regions, 3,067 businesses, 173 of the biggest investors, and 622 Higher Education Institutions. For more information on credit use, see Race to Zero (2021) [Race to Zero Criteria](#)
- 91. Launched in 2021, this industry-led alliance brings together 55 banks from 28 countries, which are committed to aligning their lending and investment portfolios with net-zero emissions by 2050. It represents over US\$37 trillion. For more information on credit use, see the [NZBA Commitment Statement](#)
- 92. Launched in 2021, NZIA brings together eight of the world's leading insurers and reinsurers committing to individually transition their underwriting portfolios to net-zero greenhouse gas (GHG) emissions by 2050. For more information on credit use, see the Net-Zero Insurance Alliance's [Statement of commitment by signatory companies](#)
- 93. Group of asset managers committed to supporting net-zero goal by 2050 and to support investing aligned with net-zero. Launched in 2020, it represents US\$43 trillion in assets. For more information on credit use, see their [Net-zero Asset Managers Commitment](#)

Climate Action 100+ ⁹⁴	Discouraged. The use of carbon credits should be avoided and limited, if applied at all. It should not be used in sectors where viable decarbonization technologies exist. Greater transparency on the use of credits is encouraged.
Science Based Targets – Financial Institutions ^{95,96}	Forthcoming. Revised guidance for net-zero targets for financial institutions is forthcoming, including the use of credits. Currently, the use of credits is not counted towards the progress of financial institutions’ science-based targets. SBTi guidance for non-financial institutions supports the use of removal credits for residual emissions.

Notes: *Residual emissions are emissions that cannot be eliminated due to the limited technologically or financially viable alternatives. **The UN-Convened Net-Zero Banking Alliance, the UN-convened Net-Zero Insurance Alliance, the Net-Zero Asset Manager Initiative and the UN-convened Net-Zero Asset Owner Alliance⁹⁷ are part of the Glasgow Financial Alliance for Net-zero, a strategic forum bringing together the leading net-zero initiatives across the financial sector. The UN-convened Net-Zero Asset Owner Alliance has not stated a position on the use of credits.

Sources: Multiple

It is important to recognize the emerging distinction between carbon neutrality and net-zero commitments. As shown in Figure 12, carbon neutrality is achieved when unavoidable emissions are compensated or neutralized within a given year using any type of carbon credits. A net-zero claim requires reaching a state of no impact on the climate from GHG emissions, with all residual emissions to be neutralized with the permanent

removal and storage of GHG emissions (not emission reductions). Reaching a consensus on the definition of these claims will help companies understand what their decarbonization claim specifically entails, without the potential for overlapping approaches that create unnecessary confusion.

94. Investor-led initiative launched in 2017 to ensure the world’s largest corporate greenhouse gas emitters take necessary action on climate change. For more information on credit use, see Climate Action 100+’s [FAQ](#)

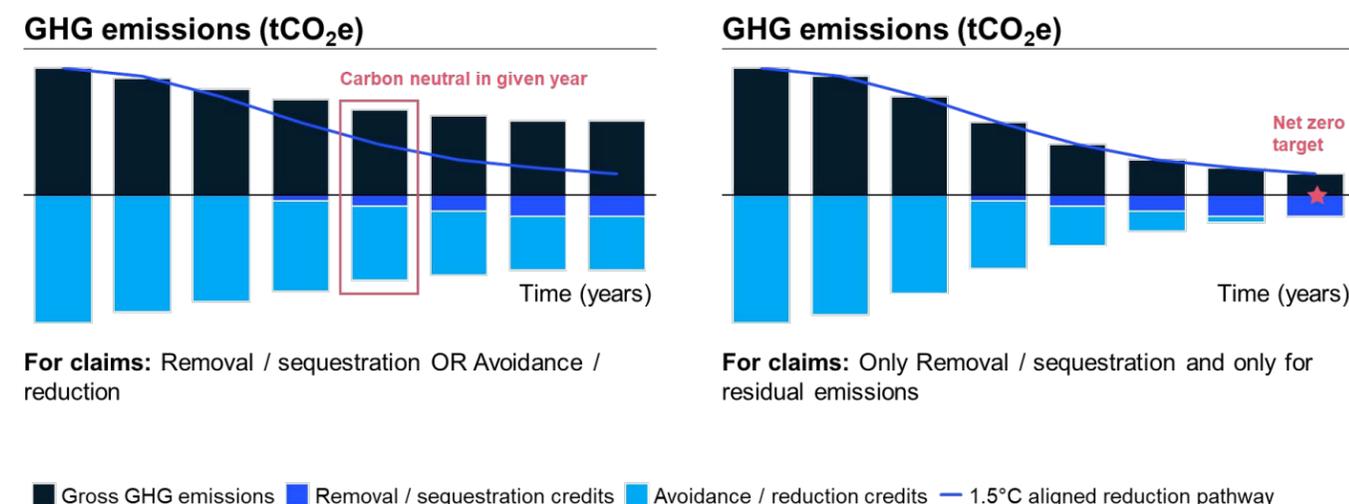
95. Framework launched by SBTi for financial institutions to align their lending and investment activities with the Paris Agreement. For more information on credit use, see SBTi (2021) [Financial sector science-based targets guidance](#)

96. See SBTi (2020) [Foundations for Science-based net-zero target setting in the corporate sector](#)

97. International group of over 40 institutional investors committing to transition their investment portfolios to net-zero by 2050. Representing US\$6.6 trillion in assets. For more information, see the [Commitment Document for Participating Asset Owners](#)

FIGURE 12

DISTINCTION BETWEEN CARBON NEUTRAL CLAIM (LEFT) AND NET-ZERO CLAIM (RIGHT)



Source: Vivid Economics

Low-integrity credits risk limiting future carbon market growth.

These credits may not uphold environmental integrity of emissions reductions and therefore carry reputational risks to credit purchasers. Similarly, poorly designed policies may undermine a program’s effectiveness at reducing GHG emissions and public confidence in compliance markets. New entrants without prior experience with carbon markets will need to be confident in their integrity to enter and participate.

Conversely, maintaining high integrity standards builds confidence across compliance and voluntary markets.

Improved standards adopted in the voluntary market can be transferred into compliance markets, particularly as more compliance systems integrate carbon credits into their policy design. A regulatory requirement to collect company-level GHG emissions data, which is a prerequisite for a compliance market, could also provide the baseline data for a company to build an abatement strategy that culminates in a net-zero commitment.

98. Double issuance (when more than one credit is issued for the same emissions reduction/removal), double use (when a credit is counted twice by the same entity) and double claiming (when the same credit is counted by several entities) are all forms of double counting. [VCMI \(2021\)](#).

INFRASTRUCTURE

Market integrity and market infrastructure are intertwined across compliance and voluntary markets. Infrastructure incorporates a broad suite of tools that make trading within carbon markets straightforward and increase transparency of ownership.

- **Market infrastructure** - This includes registries, managed either by regulators or voluntary carbon standards, that oversee asset ownership. The TSVCMI identifies the need for greater transparency in voluntary market registries to provide financial markets with data relevant to market analysis (credit retirement, retiring entity, etc.). Traceable serial numbers and transparent reporting can also reduce the risk of double issuance, double use and double claiming as well as enhance comparability and provide clearer price signals.⁹⁸ The business intelligence company IHS Markit established the Global Carbon Index, an index tracking

carbon allowances in leading compliance markets (e.g., EU, California and RGGI), and is now preparing to launch a Global Carbon Credit Meta-Registry to connect voluntary market registries.^{99,100}

- **Financial infrastructure** - Building mature financial arrangements, from structured finance to standard contracts, will be important for scaling voluntary market credits. The experience in compliance markets such as the EU ETS or California, where standard financial (spot and futures) contracts were developed to encourage trading and price risk management via exchanges could provide lessons for developing voluntary market-specific contracts and exchanges.¹⁰¹ Establishing standard financial contracts, would also increase transparency in over-the-counter markets, providing a foundation from which bespoke contracts can be negotiated. Similarly, unlocking new financial structures such as blended or structured finance could unlock new sources of capital to invest in voluntary market projects and assets.¹⁰²

The absence of infrastructure in both voluntary and compliance markets risks eroding market confidence and limiting market size, and thus undermines their ability to play a full role in achieving net-zero. Limited access to market information by market participants impedes robust analysis to understand market dynamics. This could create potential integrity concerns such as unclear opaque credit ownership or double claiming. It could also create market frictions due to illiquidity (elongated trading processes) caused by high due diligence requirements (such as establishing legal ownership). Existing

compliance and voluntary markets already have in place systems to guard against these risks, but increased scale may necessitate creating additional infrastructure, including automated verification checks on ownership and accounting.

Connected infrastructure benefits the overall carbon market. The case for common market infrastructure is clear—it would reduce reputational risks, transaction costs and ease entry into carbon markets for new participants. Market infrastructure development also generates a virtuous cycle in the absence of formal connectivity. Professional and technical services offered in compliance markets can be transferred to voluntary markets. This includes third-party verifiers, registry service providers, market exchangers or brokers, and other supplemental services. Growing this common market for infrastructure providers reduces the transaction costs for carbon markets and increases the technical capacity available to provide environmental or financial services to market participants.

ACCOUNTING (ARTICLE 6)

Both compliance and voluntary markets can benefit from the scaling made possible by international carbon markets. Coherent, practical guidance for voluntary markets and cross-border compliance markets can help to increase linkages, mobilize demand and increase flows of mitigation investment in line with net-zero.

Article 6 negotiations are an opportunity to provide market confidence across compliance and voluntary markets. Common guidance for international transfers clarifies the “standard operating procedure” that companies should follow. The framework under Article 6 is therefore

an important factor to determine the future form of carbon markets. While the broad rules governing Article 6 are agreed upon, the specific provisions are yet to be finalized and will be a major point of discussion at COP 26.

Key outstanding issues include:¹⁰³

- **Defining how to account for ITMOs across the different types of NDC targets.** For instance, the guidance might provide specific processes for NDCs which use a single year mitigation target (e.g. 55% below 1990 levels by 2030) to avoid countries acquiring ITMOs to reduce their emissions only in the target year rather than across the entire NDC period. An additional technical issue is how to account for ITMOs from sectors not covered under a country’s NDC, given the need to conduct a corresponding adjustment.
- **Whether trade using the Article 6.4 mechanism requires a corresponding adjustment under Article 6.2 to avoid double counting.** To date, Article 6 negotiators have not been able to find consensus on whether the corresponding adjustment applies only to bilateral transfers or also encompasses the new centralized mechanism which serves as a successor to the Kyoto Protocol’s CDM.
- **Options to ensure that international cooperation provides an “overall mitigation in global emissions” (OMGE).** An OMGE, referenced in Article 6.4 but not Article 6.2, could require the cancellation of a share of traded credits to ensure that overall emissions decrease instead of only transferred between market participants.

- **The extent to which existing projects and credits developed under the UN Clean Development Mechanism are transitioned to the Article 6.4 mechanism.** The CDM served as a mechanism to generate emission reduction credits for compliance under the Kyoto Protocol. Negotiators must consider whether existing CDM credits will be eligible to meet NDCs, and whether projects and/or methodologies will be transferred to generate credits under the new mechanism.

Depending on negotiation outcomes, there are practical consequences for how carbon markets are structured. These include accounting requirements, potential substitutes to carbon market transactions from bilateral ITMOs or the Article 6.4 mechanism, and new market infrastructure needs.

- **Voluntary standards may align with Article 6 and require a corresponding adjustment.** As such, projects from countries where corresponding adjustments are not implemented may lose market access for sources of demand that require a corresponding adjustment. However, because corporate and national emissions accounting remain separate, it may be possible for companies to use international credits provided they are transparent that those reductions remain part of the national balance of the host country. Whatever the outcome, it is crucial that regulators and market participants transparently disclose the accounting approach used to prevent double counting.

99. IHS Markit: [Global Carbon Index](#)

100. IHS Markit (2021) [IHS Markit to Launch Global Carbon Credit Meta-Registry](#)

101. Voluntary market-specific exchanges are already being established, such as Xpansiv’s trading in Global Emissions Offsets (GEOs), AirCarbon Exchange’s CORSIA Eligible Tokens (CETs), or the upcoming launch of Climate Impact X in joint operation by DBS, SGX, Standard Chartered and Temasek.

102. For more information on voluntary market infrastructure, see TSVCM(2021) [Final report](#)

103. For additional information on technical issues under Article 6 that are unresolved ahead of COP 26, see for example Kizzier, Levin and Rambharos (2019), [Making Sense of Article 6: Key Issues and What’s at Stake](#).

Although corresponding adjustments are outside the scope of the TSVC, the Taskforce underlines the key requirement that carbon credits remain unique regardless of Article 6 negotiation outcomes.

- **The potential transition from the CDM to Article 6.4's new mechanism could alter voluntary market dynamics. For example, if previously issued credits under the CDM are carried over into Article 6.4's new mechanism, prices could be permanently depressed due to significantly greater supply. By contrast, if nothing from the CDM is carried over (including registered projects and methodologies), prices could increase due to delays in new supply as new methodologies are developed and projects launched, validated and verified.**
- **Article 6 guidance may create a role for common market infrastructure across voluntary market credits and compliance markets. This is particularly relevant to provide market assurance, where traded assets should avoid being claimed towards multiple NDCs. This could require centralized infrastructure such as a registry to determine asset retirement across voluntary market standards and compliance markets. This is particularly relevant for programs where the overlap is explicit, such as CORSIA (a compliance market served by voluntary market credits).**

Robust and transparent accounting frameworks for compliance or voluntary markets can increase overall market confidence. Voluntary market credits can reach across multiple jurisdictions. Therefore, the presence of accurate accounting and transparent reporting reduces the reputational and environmental risk of double counting. These systems could aid emerging compliance markets to permit credits into their policy design, because there is high confidence that the accounting will integrate with the standards used for covered entities under the program. Given the benefits of further carbon market integration, robustly applied accounting can provide policymakers confidence that voluntary carbon credits do not present risks to policy integrity.

BOX 3

POTENTIAL IMPACTS OF THE TREATMENT OF ITMOs ON CARBON MARKET COMPOSITION

The rules and design choices surrounding ITMOs will influence the future carbon market in different ways:

- **At one extreme, only government-to-government bilateral transactions would be counted as ITMOs, which could lead to increased prices.** In this case, for an ITMO traded under Article 6.2 to count towards an NDC, it would have to be owned by the acquiring company's government as part of agreement with the selling country's government. The implication is that carbon market transactions would play a smaller role than in the absence of government-facilitated ITMOs.
- **Alternatively, privately held ITMOs could count towards the acquiring country's NDC, which would increase demand for carbon market transactions.** Any ITMO held (such as a carbon credit) by companies in an acquiring country would count towards the acquiring country's NDC, and not the selling country's NDC, even though the credit is not directly held by the acquiring country's government. Whether a corresponding adjustment would be needed remains unclear.
- **Finally, if no agreement is reached on Article 6, it is likely that the market dynamic will remain unchanged.** If no consensus outcome is reached on Article 6, and neither Article 6.2 nor 6.4 mechanisms come into force there would be no ITMO trade under Article 6 and no change from the status quo in carbon markets.

NAVIGATING THE CHANGING CARBON MARKET LANDSCAPE

The acceleration of carbon markets makes understanding compliance and voluntary markets a necessity for global companies and investors. As net-zero pledges and carbon pricing systems proliferate, business previously uninvolved in carbon markets will likely become new entrants. They will discover a complex ecosystem of policies, standards and markets that require careful navigation, but which offer critical opportunities to contribute towards meeting climate targets.

By the mid-2020s, any business with a substantial GHG emissions profile will likely be impacted by carbon markets in some way.

The vision presented in this report suggests a larger carbon market, where compliance markets drive decarbonization while voluntary markets fill important coverage gaps. This multi-faceted composition of carbon markets on the pathway to net-zero therefore requires considerable examination by companies who may not be familiar with the technicalities of how these markets operate.

Even when compliance market gaps remain, firms don't even need to operate under a compliance market for carbon pricing to impact their business model. A carbon border adjustment mechanism, such as that being implemented by the EU from 2026 onwards, places an obligation on firms outside of a carbon market's territory. Therefore, firms outside of the EU but who import energy and other goods will soon be engaged in a compliance market despite their facilities being outside their boundaries.¹⁰⁴ Similarly,

pressure from investors and stakeholders to establish a corporate decarbonization commitment could require businesses to enter voluntary markets even in the absence of local compliance markets that establish a regulatory obligation.

There are important lessons which companies and investors can take on board to successfully navigate both voluntary and compliance markets. Companies and investors will need to navigate the future carbon market strategically, given the central role that it could play in achieving a net-zero economy. This section offers four guiding principles organizations may consider for effective use of both frameworks as part of a firm-wide aligned climate strategy.

- **Readiness** – Companies will be rewarded for taking proactive steps to build internal capacity for carbon pricing, accounting and reporting across their operations.
- **Adaptability** – Acknowledgement that carbon markets are evolving, and that corporate strategy should therefore be flexible to move with changing circumstances.
- **Comprehensiveness** – An approach that encompasses all GHG emissions within a company's control and examines both compliance and voluntary market opportunities.
- **Integrity** – A transparent approach that emphasizes high quality credit purchases as being in the company's interest, given the reputational risks of credits with environmental integrity concerns.

This section elaborates how these four principles can help position companies and investors to successfully navigate compliance and voluntary markets. This means having the flexibility of carbon credits to supplement their internal decarbonization while minimizing exposure to damaging policy and reputational risks that could harm their market position in a net-zero economy.

READINESS

Internal abatement will require long-term planning from businesses. Companies with decarbonization commitments or covered by compliance markets need to plan for decarbonization. Prioritizing internal abatement, consistent with the mitigation hierarchy, requires planning for technology development, deployment or commercialization. This is especially true of hard-to-abate sectors where zero-carbon technologies such as green hydrogen are nascent or not cost-competitive.¹⁰⁵ Both compliance and voluntary markets will play a role in channeling investment into these technologies and increase their competitiveness.

Establishing internal processes is important to prepare for carbon pricing. Vigilance is needed to ensure readiness in a dynamic and rapidly evolving landscape. Companies that envisage engaging in carbon markets can take steps to ensure readiness:

- **They should assign clear internal responsibility for the abatement strategy,** involving senior management, and assign a technical lead for tracking the GHG footprint across the supply chain.

- **The decarbonization strategy should both include long-term targets and elaborate on available internal abatement options, describing the costs and risks involved.** The company should develop and disclose scenarios for how climate transition risks may impact company operations and develop strategies to manage those.
- **If a compliance market is forthcoming, the company should ensure internal familiarity with carbon trading mechanics.** Participation in voluntary markets can help companies and investors understand the methodologies, rules and processes necessary for acquiring carbon credits, a knowledge that can then be applied in future compliance markets.

The optimal approach will be company specific. It will depend on the company's business lines, climate strategy, geographical location (including their supply chain) and technical capacity for uncovering internal and external mitigation opportunities. The commonality across companies is the need to take readiness steps within the company's organization to prepare for the impacts of compliance markets and voluntary markets on its business and across the supply chain.

ADAPTABILITY

The future development of carbon markets is uncertain. The scenarios presented in section 4 highlight the potential range of outcomes possible for carbon pricing in the coming decades. The future composition is dependent on multiple elements that could accelerate carbon market growth or provide obstacles to their expanded usage. Considering how future scenarios may play out and their effects should be a core part of a corporate decarbonization strategy.

The frameworks governing voluntary markets

104. Similar instruments are under consideration in Canada and the United States. See [Government of Canada](#) and [Bloomberg](#) (accessed on 10/05/2021)

105. According to BloombergNEF (2021), the levelized cost of renewable hydrogen production ranged in 2019 between \$2.5-4.5, against \$1-1.75 for fossil fuel based-hydrogen. See BNEF (2021), "Hydrogen: The Economics of Production from Renewables".

and compliance markets are not static. This report posits that carbon markets will evolve so that voluntary markets focus on emissions not covered by a growing compliance market. This means that a portfolio of credits purchased today may have a different composition than one purchased in future decades.

Voluntary market credits for renewable energy deployment highlight the potential for eligibility to evolve over time. As the TSVCM identifies, some voluntary market methodologies require updating to allay concerns about whether the reductions achieved are additional.¹⁰⁶ For instance, for many years renewable energy projects provided access to a relatively cheap and scalable source of carbon credits. However, the increasing cost-competitiveness of renewable generation means that projects receiving credits may have otherwise occurred without crediting (i.e. are not additional). Due to this erosion of additionality, these projects are being phased out by independent standards such as Verra and Gold Standard except in Least Developed Countries. A corporate strategy therefore needs to be flexible to changing policy or market circumstances.

The growth in net-zero commitments is expected to drive a shift away from avoidance towards carbon removals credits. Carbon removals activities, either through nature-based solutions such as afforestation/reforestation or technologies such as direct air carbon capture and storage, will be necessary to neutralize residual emissions at net-zero. As the distinction between net-zero and other decarbonization claims is cemented and the requirement for carbon removals made explicit, companies should be ready to maintain the credibility of their carbon market strategy.

Interoperability rules between compliance and voluntary markets also evolve over time. These include changes to the volumes (due to use limit

changes) and types (due to eligibility specification changes) of voluntary carbon credits accepted into compliance systems. This will mean that credits used for compliance today may not be eligible in the future. For example, from 2021 the California Cap-and-Trade Program will require that at least half of any entity's credit usage limit can come from credits provide direct environmental benefits within California.

Companies must be adaptable to these changes. Companies failing to adapt may expose themselves financially through purchases of low-integrity credits, including those that become ineligible for use in compliance systems. They may also suffer from reputational damage or accusations of 'greenwashing' if their credit purchase strategies are not deemed credible by the public – for example if a target is over-reliant on credits, or includes low-integrity credits in its portfolio.

Adaptability offers companies and investors the possibility to grasp new business opportunities such as carbon neutral products. These carbon neutral products include flights or natural gas for home heating, where carbon credits compensate the emissions embedded in those activities. Nevertheless, establishing a carbon neutral product should follow a rigorous internal process. For instance, firms should evaluate whether a zero-carbon alternative could be made available to consumers, rather than neutralizing a product's emissions through credits. Nevertheless, in hard-to-abate sectors such as aviation, a carbon neutral product that uses high-integrity credits could be an option that businesses examine.

COMPREHENSIVENESS

Many companies and investors have a GHG footprint that is not fully covered by compliance markets. Their emissions may occur in jurisdictions lacking a compliance market, or in sectors excluded from the scope of an existing market. However,

as carbon markets continue to expand, both with the extension of the scope of existing markets and the creation of new compliance systems, a greater proportion of these emissions will be covered.

Recent trends suggest that compliance markets are likely to increase in stringency in the coming years to meet country-level targets. Long term decarbonization targets from major economies such as China, the European Union, Japan, South Korea, the United States and the United Kingdom point to a ratchet of ambition in the coming decades. This has implications for carbon markets, since all these countries have compliance markets at the national or subnational levels. The entry into force of China's national ETS and the recent Fit for 55 policy package reforms to the EU ETS demonstrate the linkage between increased long-term ambition and measures to reinforce compliance markets within major economies. This raises a regulatory obligation for companies to ramp up decarbonization efforts over time, both within their operations and across their supply chains.

As carbon markets expand, companies that currently interact with carbon markets could see the percentage of their emissions covered grow. Strategies that overlook emissions not currently covered by compliance market could face policy risks from a future ETS or other policy instrument that would enact compliance costs for newly covered facilities. Similarly, if decarbonization claims such as carbon neutrality or net-zero are expected to cover a greater percentage of a company's direct or indirect (e.g. Scope 2 or 3) GHG emissions over time, a narrow focus on current target coverage would fail to anticipate future inclusion of new emissions sources.

An effective strategy that takes advantage of market efficiency should encompass both compliance and voluntary markets. Companies may engage in both voluntary and compliance markets to maximize emissions reductions. For example, an airline operator may engage in CORSIA for its international aviation emissions, the EU ETS for intra-European operated flights, and the voluntary market for residual emissions not covered under CORSIA. This would occur supplementally to corporate actions taken to abate emissions within their operations, products and supply chain. This mix of approaches may provide companies with flexibility and remain effective and credible when combined with transparency.

Comprehensiveness also means looking beyond GHG emissions reductions when considering carbon markets. For example, voluntary markets can play a useful role in corporate strategies aligned across the broader UN Sustainable Development Goals through the development and socio-environmental co-benefits that projects can generate. In the voluntary market, 62% of carbon credits demanded in 2019 had associated co-benefits.¹⁰⁷ Therefore, engaging across a corporate sustainability team will uncover the overlaps between carbon credit purchases and achieving broader company environmental and social goals.

INTEGRITY

Investments in high integrity voluntary market credits can benefit companies and investors. They minimize reputational risks with consumers and stakeholders. Credits recognized by bodies and organizations that track corporate climate targets (e.g., TCFD¹⁰⁸, SASB¹⁰⁹, SBTi etc.) would reduce these risks, especially if credits are linked to a decarbonization claim by the company.

Credits that are later integrated into compliance

106. TSVCM (2021) [Summary pack](#)

107. [Ecosystem Dashboard](#) (includes both independent and regulatory standards)

108. Task Force on Climate-Related Financial Disclosure

109. Sustainability Accounting Standards Board

markets will be high integrity. Therefore, investing in low integrity voluntary market credits is a particularly poor strategy when looking to invest in pre-compliance credits, because policymakers are highly unlikely to allow disputed or questionable credits to be used in compliance markets. A sounder strategy is to invest in high integrity credits with recognition from specialist bodies and certification from established standards. Doing so in practice, however, can be challenging. The TSVCM has identified a lack of buyer clarity on credit quality as a key market concern that could hinder scaling up voluntary markets.¹¹⁰

Market participants can make use of available resources on best practice and innovative techniques being developed tailored to these needs. Industry-led bodies such as the ICROA provide guidance on how to act with integrity as a buyer and seller within the voluntary market. For example, their Code of Best Practice defines key criteria that carbon credits must follow as well as a list of acceptable standards.¹¹¹ The voluntary market is also moving towards applying CORSIA-eligibility criteria as a quality benchmark for credits

in some instances¹¹² and some marketplaces¹¹³ offer risk ratings behind projects.

Scaling up compliance and voluntary markets could also be aided by transparent reporting by companies and investors about their interactions in these markets. Indeed, the TSVCM recommends that “companies should publicly disclose commitments, detailed transition plans, and annual progress against these plans”¹¹⁴. Public disclosure is an important component towards achieving a functioning carbon market that is open to scrutiny and verification by third parties. Companies should not limit disclosure to “charismatic” projects with high socioeconomic or biodiversity benefits, but rather disclose the entire portfolio of credits purchased to meet internal GHG targets. More broadly, companies and investors should use voluntary markets where a trusted registry and tracking system is in operation. This will reduce the potential for double counting, for example with units interoperable between compliance markets and voluntary markets (e.g., credits eligible for compliance under CORSIA).

CONCLUSIONS

Every business will likely be impacted by carbon markets over the coming decade. The ambitious goal of net-zero emissions points to accelerating future growth in carbon markets and credits, particularly in emerging markets. Around 52 percent of global GHG emissions could be covered by a compliance market or corporate net-zero targets by the end of the decade – up from 24% today. **Put another way, if a company is a significant emitter of GHGs, it is more likely than not that those emissions will be covered by a carbon market.** An even larger proportion of companies may be impacted by carbon border adjustments in key export markets. Many companies currently have little or no experience with carbon markets, but this future growth makes understanding compliance markets and voluntary markets compulsory for global companies and investors.

For businesses new to carbon markets, grasping the complexity of compliance and voluntary markets – and the significance of their future integration – is key. Voluntary markets offer innovation, agility and geographical reach for market incentives to reduce emissions. Compliance markets provide a potential market for voluntary credits while reducing costs for entities covered under an ETS. The future carbon market will encompass both approaches, with deeper integration between them likely.

A future carbon market that can support achievement of Net-zero goals will depend on progress on four common key factors. Clarity on international transfers, mature financial infrastructure, transparent high integrity credits pave the way for demand commensurate with achieving net-zero emissions. These elements are already emerging, but further progress is necessary for a fully realized carbon market to emerge. Nevertheless, businesses should plan for a carbon market that advances in this direction over the coming decade.

Companies and investors must navigate a multi-faceted carbon market. By progressing the factors above, new entrants will be mobilized into either compliance or voluntary markets. Nevertheless, operating in accordance with guiding principles – comprehensiveness, readiness, integrity and adaptability – will contribute towards a positive engagement across carbon market frameworks.

As COP26 approaches¹¹⁵ there is an opportunity for governments, companies, investors and stakeholders to build a future vision for carbon markets. The vision could encompass the benefits provided by both compliance and voluntary frameworks with strong governance (as articulated by the TSVCM). This report makes clear that both frameworks are necessary, and will complement each other as significant contributors to the toolkit required to meet net-zero emissions.

110. TSVCM (2021) [Summary pack](#)

111. ICROA (2021) [The ICROA code of best practice](#)

112. E.g., [Xpansiv's Global Emissions Offsets \(GEOs\)](#)

113. E.g., the upcoming [Climate Impact X](#)

114. [TSVCM \(2021\)](#)

115. The 26th UN Climate Change Conference of the Parties (COP26) brings parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. It will take place in Glasgow from October 31st to November 12th.

ANNEX: METHODOLOGY

This report provides a projection of potential carbon market coverage in 2030 that encompasses both compliance and voluntary markets. Note that this is an indicative calculation that seeks to identify the likely coverage of these carbon markets at a high level, it is not a forecast of future growth. To calculate the percentage of global GHG emissions covered by carbon markets, **the emissions covered under voluntary and compliance carbon markets are calculated separately** and then summed. To minimize the potential for emissions to be double counted (i.e. included in both compliance and voluntary markets), voluntary market commitments are excluded using an assumption based on where the company's headquarters are located. Data availability prevents a full accounting of corporate emissions to determine actual overlaps with compliance carbon markets, so this approach provides a total coverage estimate.

Estimating compliance market (both emissions trading and carbon taxes) coverage in 2015 and 2021 uses data from the World Bank's Carbon Pricing Dashboard¹¹⁶, which includes data on carbon pricing systems across the globe. We examined the following data available through the dashboard:

- A. Whether it is under consideration or already implemented;
- B. If implemented, year of implementation;
- C. GHG emissions coverage in MtCO₂e; and
- D. Any overlap in coverage with other compliance system (also in MtCO₂e).

Considering only ETS' and carbon taxes already implemented (identified from A above), the level of emissions covered is calculated (identified from C above) in the year in question (i.e. 2015 or 2021, identified from B above). Any overlap in coverage across compliance systems in a given jurisdiction (identified from D above) is subtracted to avoid any double counting of emissions coverage.

Compliance market coverage in 2030 assumes countries will have carbon pricing if they either a) currently have a system implemented, b) are marked as having carbon pricing 'under consideration' by the World Bank under A above, or c) participated in the Partnership for Market Readiness¹¹⁷. Using data from Climate Watch¹¹⁸, we assume carbon pricing in these countries covers emissions from electricity/heat, industrial processes, and transportation sectors, which reflect the direction of travel in terms of carbon pricing coverage. The analysis uses the following exceptions: a) the European Union, where building sector emissions are also included to reflect plans to introduce a new ETS for this sector¹¹⁹, and b) using existing coverage data where the sum of emissions from the three sectors is less than the known coverage level.

Voluntary market coverage assesses the emissions of 201 companies. The company sample is comprised of the "Focus Companies" under the Climate Action 100+ initiative¹²⁰ and the top 50 public companies globally by market capitalization¹²¹.

We collected the following data on these companies:

- Scope 1 and 2 emissions (and Scope 3 emissions for oil and gas sector companies);
- whether they have a carbon neutral/net-zero target; and
- if they do, the year this was implemented.

Data was obtained through external sources such as company sustainability reports.

Voluntary market coverage in 2015 and 2021 considers Scope 1 and 2 emissions from companies that have implemented carbon neutral or net-zero targets by the given year. For 2021, this is supplemented by Scope 3 emissions from oil and gas companies that have explicitly stated their targets include these emissions (e.g., Shell, Eni, bp, Equinor).

Voluntary market coverage in 2030 assumes the remaining companies (from the 201 assessed) without a carbon neutral/net-zero target in 2021 will adopt one by 2030. In terms of Scope 3 emissions from oil and gas companies, these are included only for companies headquartered in North America and Europe & Central Asia, which is consistent with the location of companies that include Scope 3 emissions in their targets today.

The estimate of carbon market coverage combines compliance and voluntary market estimates in a way that minimizes double counting.

These are the values presented in Figure 1 and Figure 4. For each year, the covered emissions across the two sub-markets are aggregated, subtracting emissions from companies headquartered in jurisdictions that already have a compliance market in place (e.g., all emissions from companies with carbon neutral/net-zero commitments headquartered in South Korea are excluded from the combined metric to avoid double counting with the South Korea ETS). This means that the combined values do not reconcile with the separate values for compliance and

voluntary market coverage. This was undertaken to minimize double counting of emissions coverage across these markets to provide a projection of total carbon market coverage in 2030.

116. See [Carbon Pricing Dashboard](#)

117. See [Partnership for Market Readiness](#)

118. See [Climate Watch](#)

119. See [European Commission](#)

120. See [Climate Action 100+](#)

121. See [PwC Global Top 100 Companies 2021](#)