Corporate Engagement with Voluntary Carbon Market Claims

Findings and Recommendations

THE CLIMATE BOARD
CORPORATE SUSTAINABILITY MADE REAL.

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Corporate Engagement with Voluntary Carbon Market Claims: Findings and Recommendations

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I. Foreword

The Climate Board (TCB) developed the following key insights and overall assessment report in response to the Voluntary Carbon Markets Integrity (VCMI) Initiative's request for impact and implementation research. This report examines the challenges corporate actors engaging with the VCM and the VCMI Claims Code of Practice face. It also examines obstacles and key themes that, if addressed, might unlock broader corporate adoption of VCMI's framework.

Structured in phases, which were for the most part developed sequentially so that each phase could inform the next, TCB's research was carried out over a short period from mid-August until the first week of October 2023 – a timeline designed to coincide with New York Climate Week in mid-September and ahead of COP28, which began at the end of November. An overview of the phased approach - a literature review and a survey of corporate stakeholders, parameters and findings – are detailed in sections III, IV and V, with summary takeaways in section II and fuller detail and select recommendations in VI.

While the research approach and findings were routinely iterated with VCMI, the analysis and insights were carried out independently.

II. Executive Summary

- **We found evidence in our research that participation by corporates in the Voluntary Carbon Market (VCM) offers significant opportunities for climate action and positive impacts,** including collaboration between governments, project developers, and the private sector, in a united front for climate action. It also serves as a catalyst for innovation and learning, particularly benefiting developing nations in their pursuit of climate-friendly initiatives.

- **However, feedback from ~150 corporate executives in our survey and a literature review of more than 89 recent publications suggests** that the challenges corporates face in setting and executing carbon reduction strategies – as well as opacity in the VCM more broadly – may limit the potential for corporate participation in the market and in making a VCMI claim.

- **Most corporates are already consumed by managing internal operational abatement activities to reduce their greenhouse gas (GHG) emissions and overwhelmed by the myriad of standards and guidance available externally – such that corporates may be hesitant to adopt an additional framework or standard**. Findings from our survey and interviews indicate that most corporates are focused on executing Scope 1 and Scope 2 strategies, and if more advanced, grappling with the challenges of Scope 3 data and supply-chain complexity more broadly. Some 68% of survey respondents had a Scope 1 and 2 target (70% said they were facing critical challenges reaching their climate goals); 40% of respondents had a Scope 3 target (93% said they were facing critical challenges reaching their goals). Corporate executives are confused and/or frustrated by the proliferation of multiple sustainability reporting frameworks, which are not clearly aligned and lack comparability across metrics. Navigating the VCM, with its multiple participants, adds an even greater level of noise to corporate executives' agendas.

- **Many corporates are capital (including human capital) constrained.** The vetting of a wide array of market purchase options, let alone simply navigating the VCM, requires resources to assess the relevance and potential impact. Even for some of the largest multinational corporates (74% of survey respondents were large companies), internal resources are not abundant, and most resources are dedicated to determining what internal reduction levers should be deployed.

- **Corporates that align with SBTi principles (regardless of whether they had submitted a target) seem hesitant to purchase carbon credits. This hesitation is driven in part by what is a misunderstanding around how a VCMI claim might complement a company's broader carbon strategy and alignment with SBTi principles.** Many companies still view any type of participation in the carbon market as "offsetting" and will reference that carbon offsetting is not allowed under SBTi standards until they've reduced at least 90% of their emissions. More education is needed around how Beyond Value Chain Mitigation (BVCM) differs from offsetting and why organizations should contribute.

- **Due to the public criticism of the VCM, some corporates seem to be hesitant to publicize their participation in the carbon market and/or be a "first mover."** This sentiment seems to also lessen organizations' interest in making a VCMI claim. Organizations highlighted the risks of participating in the carbon market, including criticism of the integrity of carbon credits and movement away from the term "carbon neutral."

- **VCM is a nascent market with a need for more coordination and education among corporates.** In particular, the value of participation in voluntary carbon markets is not fully understood, even for corporates which are arguably more mature in their sustainability journeys and advanced in their carbon reduction strategies.

- **Vague nomenclature and the lack of specificity in the VCM requirements is a hindrance to corporate participation.** The lack of clarity in terminology, standards, and understanding of risk-weighted benefits – in addition to lack of nuance based on industry, region, and/or company size – impacts corporate participation in the market. This uncertainty adds a level of risk, particularly in the current politicized environment, where many companies are concerned about greenwashing.

- **Data issues warrant more attention and industry coordination to better assess benchmark costs (and impact).** Some corporates have established an internal cost of carbon and/or understand some component of their industry costs at an operational level. But it appears many seem to be in an early phase of assessing that value, and reluctant to provide internal data that could inform a broader industry view analysis – as indicated by the survey, in which over half of companies surveyed did not provide an estimate on the cost of decarbonization (either because they skipped the question or responded that they did not know).

III. Introduction

While there is increased interest in the potential for voluntary carbon markets to enable greater climate action, concerns exist around the integrity of carbon credits, as well as the risk of overstating their impact if they are used without sufficient rigor as a part of corporate climate commitments.

This report examines the challenges corporate actors face engaging with the VCM and the VCMI Claims Code of Practice – a rulebook for credible use of high-quality carbon credits on the path to net zero. It also examines obstacles and key themes that, if addressed, might unlock broader corporate adoption of VCMI's framework.

The goal of our analysis was to help inform VCMI's decision on whether to introduce a "Bronze" entry tier that allows companies to complement decarbonization efforts if there is still a gap to the targets, weighing the expected benefits against the risks.

It consists of two components: 1) a literature review summarizing the latest research on the VCM; and 2) the corporate perspective – an obstacles analysis surveying and interviewing companies on the challenges to making a claim with VCMI without added flexibility. This report synthesizes these workstreams to provide actionable recommendations.

Our findings provide an informed, unbiased fact base for VCMI to evaluate the merits of allowing Beyond Value Chain Mitigation (BVCM), such as the purchase of high-quality credits, and considering the impacts on corporate adoption, and maintaining integrity. This research aims to support an evidence-based framework that expands climate action through voluntary carbon markets while upholding ambitious aims for decarbonization.

The research was conducted during a limited time frame; a longer-term, follow-up study could gather even more corporate perspectives, conduct complex modeling, and take a deeper dive into reviewing the literature.

IV. Approach

A. Literature Review Methodology

This literature review follows a systematic approach to identify, synthesize, and analyze relevant research on VCMs' potential to enable greater climate ambition. The focus is on literature published within the last five years to provide insights on the contemporary context, amid the recent surge in corporate net zero commitments in the wake of the Paris Agreement.

Peer-reviewed academic studies, multilateral reports and other close market observer publications are included. The search process involved a review of sources from the following research platforms:

- EBSCOhost: Provides access to over 370 individual databases containing millions of records. Databases include Academic Search Premier for peer-reviewed journals and Business Source for business research, among others.
- JSTOR: Provides access to over 12 million academic journal articles, books, and primary sources in 75 disciplines.
- ProQuest: Provides access to 90,000 authoritative sources, 6 billion digital pages, 20 million newspaper pages, and 450,000 e-books.
- Multilateral institution publications: Search of key websites from the United Nations Framework Convention on Climate Change (UNFCCC), World Bank, Organisation for Economic Co-operation and Development (OECD), International Chamber of Commerce (ICC), Environmental Defense Fund (EDF), World Resources Institute (WRI), etc. for relevant insights, reports and commentary.
- Other close market observer publications: work originating from think tanks, academic journals, banks, consultancies, law firms and elsewhere in the private sector.

The literature is synthesized narratively to identify key themes, arguments, evidence gaps, and implications.

A qualitative synthesis approach was used to systematically extract and compile key themes, perspectives, and empirical findings from the academic studies, market reports, and corporate documents reviewed. Particular attention was paid to statements relevant to assessing VCM risks, benefits, and potential to spur more ambitious corporate climate action. Direct quotes and empirical data on factors like market impacts were extracted.

After reviewing the full set of literature, major trends, perspectives, and findings were identified and categorized to reveal areas of alignment, debate, and evidence gaps across the sources. Key areas of focus included VCM integrity, impact on corporate abatement efforts, optimal use cases, and overall influence on net emissions outcomes.

Finally, implications for policymakers, corporates, and other stakeholders were derived. Our qualitative synthesis approach aimed to extract the most salient insights from across the literature and identify where additional research is needed to clarify the role VCMs can play.

The goal was to move beyond isolated perspectives and arrive at higher-level conclusions regarding whether and how VCM participation can accelerate private-sector emissions reductions.

B. Obstacles Analysis Methodology: Survey

We developed the survey questions based on preliminary findings from our literature review and collaboration with the VCMI and Trove to ensure the interview questions addressed VCMI's research objectives.

We aimed to receive survey responses from a diverse set of companies. To do so, we set targets for the percentage of responses we were aiming for in 10 industries and 9 regions.

We determined industry target share based on the following criteria: (1) estimated contribution to global carbon emissions; (2) estimated dollar contribution to the global economy; (3) relative market size as a percentage of the overall market.

10 Target Industry Groups and Targeted (%) Response

1. Basic Materials: 8-10%
2. Energy: 12-15%
3. Utilities: 8-10%
4. Industrials: 8-10%
5. Real Estate: 8-10%
6. Transportation & Logistics: 8-10%
7. Consumer Goods & Services: 12-15%
8. Technology & Media: 8-10%
9. Healthcare & Pharma: 8-10%
10. Financial Services: 12-15%

Regional target share was based on a country or region's market capitalization over the past year as compared to the global market (as seen on FinViz's Map of the Market[1]).

9 Target Regional Groups and Targeted (%) Response

1. United States: 40%
2. Canada: 6%
3. Rest of Americas: 7%
4. UK and Ireland: 14.5%
5. Rest of Europe: 11.5%
6. China: 5.5%
7. Japan: 5.5%
8. Rest of Asia: 9%
9. South Africa and Australia: 1%

We monitored our survey responses to make sure that they were spread across multiple regions and industries and leveraged TCB's network of contacts to fill gaps in geographies and sectors that we felt were underrepresented.

In total, we contacted more than 3,600 companies and received 145 survey responses.

C. Obstacles Analysis Methodology: High-Touch Interviews

To supplement the survey results, we conducted 30-minute interviews with 16 companies that had participated in the survey and agreed to an interview. The interviews allowed us to get more nuance and context on how companies had answered the survey questions. We aimed for a mix of regions, industries, and company sizes. A breakdown of the industries and regions that participated in the interviews can be found in the Results section below.

We analyzed the interview transcripts to identify common themes and insights and pull direct quotes that illustrate the survey's findings.

Key goals of these interviews:

- Better understand the challenges companies face in advancing on their climate goals.
- Assess the level of interest and conditions that would increase VCM participation.
- Gauge respondents' receptiveness to potential new VCMI claims tiers.
- Identify incentives and flexibility that could broaden the adoption of VCMI's framework.

D. Limitations

While this analysis aims to provide a robust fact base to inform VCMI's claims tier development, some limitations should be noted.

[1] https://finviz.com/

The research was conducted during a limited time frame, which constrained the extent of literature review, surveying and interview outreach. With a longer period of study, additional corporate perspectives could be gathered.

The corporate surveys yielded a limited sample size of 145 responses. Participation bias means this may overrepresent companies that are already engaged in climate action. Broader participation in any subsequent study could reveal additional obstacles.

Many companies were reluctant to share potentially sensitive internal data on abatement costs and emissions, and/or did not have this information readily available.

Despite these constraints, the mixed-methods analysis synthesized the best available evidence within our project's limitations. It provides initial perspectives from corporates to help inform VCMI in its decision-making. Follow-on efforts with an expanded time frame and access to more data could build on these findings.

V. Results

A. Literature Review

The voluntary carbon market plays a pivotal role in enabling corporations to bring down their emissions and contribute towards global climate goals. Our comprehensive literature review synthesizes insights from more than 89 publications, highlighting key challenges that need to be addressed to ensure the integrity of the carbon market while simultaneously facilitating corporate participation.

Further analysis is provided in Appendix A, which includes 18 pages of analysis, comparison of different views and explanation. The sourcing for this section (in Roman numerals) can be found in Appendix C.

Key Findings

Benefits of the voluntary carbon market[i]

The voluntary carbon market (VCM) plays a valuable role in reducing emissions within corporate value chains, beyond companies' internal decarbonization efforts (Trove Research, 2023). In certain markets, there have been robust benefits.

High-quality carbon credits, when combined with ambitious emissions reduction strategies, financially contribute to global mitigation efforts while helping companies achieve carbon neutral or net-zero status (EON, 2023; Latham & Watkins, 2022). The VCM also mobilizes crucial funding for climate solutions lacking policy support, like forest conservation, providing economic incentives for emissions reductions (University of British Columbia & Zhejiang University, 2023; Everhart, 2023). For instance, the VCM could be a critical financing mechanism for a wide range of climate solutions, from scaling direct air capture technologies

to halting deforestation (IEA, 2023; Barata, P. M., & Paltseva, J., 2022, RMI 2023; Henretig, J., & Smith, C.,2023)

The VCM offers flexibility in addressing challenging residual emissions where barriers prevent further abatement (CarbonCredits.com, 2023; McKinsey, 2022). Additionally, the VCM spurs innovation in quantification methods and carbon removal technologies (Haya et al., 2023). It can synergize with internal abatement for cost-effective mitigation (EON, 2023).

Trove's analysis from 2023 finds that companies that are material users of carbon credits reduce their emissions at a median rate of 6% per year, compared to only 3% per year for companies not using credits (Trove, 2023). This suggests that voluntary carbon credit purchases drive active emissions reductions, rather than granting a "license to pollute." Companies buying credits tend to have robust climate strategies, underscoring the importance of improving credit quality while recognizing their effectiveness (Trove Research, 2023; Everhart, 2023).

Projects funded by private participation in the VCM can influence government action. In particular, there are many benefits from public-private partnerships that help support investments in developing countries, which can push for greater regulation and documentation around climate action. Additionally, data from these projects can improve government support of further climate action, thereby influencing policy decisions. (Streck, 2021)

In Canada, local, provincial, and national carbon tax programs are forcing the issue for oil & gas companies to diversify their business streams, invest in renewables, and cut emissions altogether. (Ihejirika 2021)

Overall, findings from the review demonstrate that the VCM plays an important role in mobilizing finance, supporting emissions reduction efforts, and helping organizations achieve climate neutrality, provided credits are of high integrity.

Confusion around terminology and accounting[ii]

Such confusion in the context of carbon emissions and climate change is well-documented. Unclear distinctions between terms like *carbon neutral*, *net zero*, and *climate positive* have contributed to this (Netflix, 2021; PlanA.Earth, 2023.; IFAC, 2022). For example, Netflix acknowledges the need for clarity in defining these terms in their environmental commitment (Netflix, 2021). PlanA.Earth provides definitions highlighting the differences between carbon neutral, net zero, and climate positive, and underscores that these differing terms can lead to confusion (PlanA.Earth, 2023.).

Inconsistent methods for baselining emissions and accounting for credits/removals have further exacerbated this problem (IFAC, 2022; McKinsey, 2021). The International Federation of Accountants (IFAC) emphasizes the importance of transparent reporting and accounting practices for using carbon credits, noting the lack of specific accounting requirements (IFAC, 2022). McKinsey points out that the absence of a global governance body has contributed to

inconsistent application of carbon emission claims, raising concerns about greenwashing (McKinsey, 2021).

There are also uncertainties in aligning corporate climate claims appropriately with credit usage and emissions mitigation efforts (Oxford University, 2023; Citigroup, 2023). The Oxford Principles address the need for transparency in the use of carbon credits, highlighting risks with existing practices (Oxford University, 2023). Citigroup discusses challenges in aligning climate claims with credit usage and mitigation efforts, exacerbating confusion around terminology and accounting (Citigroup, 2023).

Overall, unclear terminology distinctions, inconsistent accounting methods, and uncertainty in aligning claims with credits/mitigation have all contributed to confusion around carbon emissions terminology and accounting practices. Adoption of clear definitions, transparent reporting, and aligned usage of credits with emissions reductions are needed.

Concerns about additionality, permanence and leakage[iii]

The concepts of additionality, permanence, and leakage are pressing issues in the context of carbon credits (Romm, 2023; Stanford Social Innovation Review, 2023; Haya et al., 2023; Pietracci et al., 2023).

Additionality addresses whether emissions reductions would have occurred even without the provision of carbon credits for a given project. There are concerns that some projects may not be truly additional in reducing emissions beyond a business-as-usual scenario (Romm, 2023; Stanford Social Innovation Review, 2023).

Permanence refers to ensuring the long-term stability and durability of carbon storage, preventing reversals over time. For biological carbon sequestration such as reforestation, there are risks that carbon could be released back into the atmosphere, undermining the permanence of reductions (Haya et al., 2023; Pietracci et al., 2023).

Leakage involves the potential for increased emissions elsewhere as a result of a project, undercutting the net emission reductions. For example, forest conservation in one area could displace logging and land use change to another region (Haya et al., 2023; Pietracci et al., 2023).

Robust carbon credit standards, methodologies, and verification processes are needed to adequately demonstrate and ensure additionality, permanence, and prevent leakage. Careful accounting and monitoring can help address these concerns. However, lingering uncertainties continue around carbon credits fully mitigating corporate greenhouse gas emissions on a net basis (Romm, 2023; Stanford Social Innovation Review, 2023; Haya et al., 2023; Pietracci et al., 2023).

Data deficiencies, high costs, complex supply chains: Three significant challenges persist that hinder corporate participation[iv]

Data deficiencies pose a major obstacle, as inadequate emissions data across Scopes 1, 2, and 3 make it difficult to identify and implement suitable projects (Howorth, 2022; WEF & BCG, 2023). Companies struggle to accurately track emissions, especially in complex global supply chains, undermining the effectiveness of credits (Howorth, 2022; Amazon, 2021). Limited pricing data makes it challenging for buyers to know whether they are paying a fair price. It also makes it challenging for suppliers to manage the risk they take on by financing and working on carbon-reduction projects without knowing how much buyers will ultimately pay for carbon credits (Blaufelder, et al.. 2021).

The high costs of obtaining verified, quality credits also deter corporate buyers (Science Based Targets, 2023; WEF & BCG, 2023). Prices vary widely depending on project type and standards, with high-quality credits costing more (Lune, 2022). However, paying below cost risks project viability (Gold Standard, 2022).

Additionally, the complexity of supply chains creates barriers (Howorth, 2022; Accenture, 2021). Identifying and implementing emissions reduction projects across disparate suppliers and geographies remains challenging (WEF & BCG, 2023).

Addressing these challenges in data, costs, and supply chain complexity is crucial to enable greater corporate participation in the carbon market to achieve climate goals (Amazon, 2021; WEF & BCG, 2023). Improved data transparency, reduced costs, and supply chain integration will be key.

Lack of regulation and standardization creates risk and concerns of greenwashing[v]

The voluntary carbon market currently lacks comprehensive regulation and standardization, which creates risks for misleading claims or exaggerations around carbon neutrality initiatives, known as "greenwashing" (Dawes et al., 2023; The World Bank, 2022).

Without clear standards and oversight, some organizations may make unsubstantiated or dubious claims about use of carbon credits to promote a sustainability image, without transparently and accurately accounting for their full climate impact (GreenBiz, 2022).

The literature noted that recently, groups like the Integrity Council and Voluntary Carbon Markets Integrity have worked to establish principles and codes of practice to benchmark high-integrity carbon credits and promote transparency in the voluntary market (Kirkland & Ellis LLP, 2023; Latham & Watkins, 2022).

In addition to a lack of regulation, standardization and transparency, the lack of scale of the market compounds these issues.

Innovations to aid in scaling and increasing transparency of the VCM include sovereign governments issuing carbon credits when they exceed NDCs; “Carbonplace”, a settlement platform developed by banks for the purchase of credits; and companies who buy carbon credits becoming involved in the creation of projects (White & Case, LLP, 2023).

However, comprehensive regulation and enforcement mechanisms remain underdeveloped when compared to compliance carbon markets (The World Bank, 2022). As the voluntary

market grows, regulatory efforts will be important to prevent misleading claims and ensure the environmental benefits of emissions reductions initiatives.

Methodological limitations for forestry and land-use credits[vi]

Several key methodological challenges exist around forestry and land-use credits in carbon markets. One is policy uncertainty, as complex and shifting regulations make it difficult for project developers and investors to assess long-term viability (University of British Columbia & Zhejiang University, 2023; Everhart, 2023). Additionally, the risks of double counting pose challenges: multiple parties claiming credits for the same emissions reduction can undermine environmental integrity (Norton Rose Fulbright, 2022; UBC & Zhejiang, 2023).

There is also a lack of consistent standards defining credit rigor and usage, making it hard for buyers to assess quality and credibility (UBC & Zhejiang, 2023; Everhart, 2023). Robust quantification methodologies, registry tracking systems, and clear policy frameworks are needed to address these limitations for forestry and land use projects (Everhart, 2023; UBC & Zhejiang, 2023). Standardized protocols, auditing, and transparency in accounting can help minimize risks. However, lingering uncertainties remain around the accuracy and permanence of biological carbon sequestration. Ongoing research, monitoring, and verification will be important to ensure environmental benefits.

Challenges in determining accurate baselines for dynamic natural systems[vii]

Several key challenges exist around establishing accurate emissions baselines and accounting for dynamic natural systems, such as forests.

Ensuring the permanence of forest carbon storage over time is difficult, as ecological factors and disturbances can result in reversals and release sequestered carbon back into the atmosphere (Pietracci et al., 2023; Porras et al., 2018). Monitoring and preventing leakage, where conserved forests displace logging pressures and emissions to other areas, remains a persistent issue (Haya et al., 2023; Pietracci et al., 2023).

There are also risks of unintended consequences for local and indigenous communities if projects are not designed inclusively, undermining social safeguards (Porras et al., 2018; Pietracci et al., 2023). Robust quantification methodologies, inclusive governance, ongoing monitoring, and conservative accounting are needed to address these challenges (Haya et al., 2023; Trouwloon et al., 2023). However, fundamental uncertainties remain around quantifying a true baseline and tracking dynamic ecological changes over time (Haya et al., 2023; Pietracci et al., 2023).

Advances in remote sensing, modelling, and community engagement can help improve accounting. But inherent complexities around biological systems necessitate careful oversight and buffers to ensure permanence and social equity in use of nature-based carbon credits.

Discussion

This literature review revealed that the Voluntary Carbon Market (VCM) offers significant opportunities for corporate climate action, despite the challenges and concerns it faces. Participation in VCMs offers a range of positive impacts. Firstly, it has the potential to positively influence government action on climate, leading to the funding of climate projects in developing countries, technological advancements, opportunities for innovation, and the provision of valuable project data to inform government policies. Additionally, the VCM fosters collaboration between governments, project developers, and the private sector, creating a united front for climate action. It also serves as a catalyst for innovation and learning, particularly benefiting developing nations in their pursuit of climate-friendly initiatives.

To ensure the effectiveness and integrity of the VCM, it is crucial to address the identified challenges and concerns as detailed above. This includes improving standardization, transparency, and governance, addressing the potential inequitable impacts on communities, and managing the risks associated with negative media coverage and CSR lawsuits. By doing so, the VCM can play a vital role in driving corporate sustainability and supporting global efforts to combat climate change.

B. Obstacles Analysis: Takeaways From Our Survey

The survey had three main sections. The first attempted to understand how organizations had set their near-term targets; the second assessed their top challenges in achieving these goals; and the third asked about their participation in the voluntary carbon market.

How organizations set their near-term targets

Most respondents (69%) had already set a "science-based" or "science-aligned" target.

- 98 (68%) of the 145 survey respondents indicated that they had set a near-term science-based or science-aligned target.
- 24 (17%) have committed to developing such a target in the next two years.
- 23 respondents (16%) had not set a science-based target (SBT) and had no plans to do so in the next two years.

We asked about "science-based" or "science-aligned" targets to get a broader perspective on how companies have set their goals. We wanted to understand whether respondents were developing targets that aligned with the Paris Accord, even if they did not choose to submit these targets to the Science Based Targets initiative (SBTi) for validation.

However, it is important to note that some of the respondents who stated that they did not have a "science-based or science-aligned" target cited specific limitations with SBTi as to why they had not developed one, demonstrating respondents associate the term "science-based" or "science-aligned" with SBTi. This highlights a need for clarity in the VCMI Claims Code that articulates exactly what type of targets will meet the Foundational Criteria and whether a company needs to have an SBTi-validated target to comply.

Most companies with near-term targets align with SBTi. Of the 98 companies who had set a science-based or science-aligned target:

- 69 had at least submitted a letter of commitment to SBTi and 48 already had their near-term targets validated.
- Of those who did not submit to SBTi, 11 said their target aligns with SBTi principles and 18 said their target aligned with other guidance.
- 48% of total respondents (including those without a near-term target) had at least submitted a letter of commitment to SBTi.

Many companies that had not set a science-based target cited industry-specific concerns, such as a lack of guidance for their industry or issues with SBTi's industry-specific recommendations. To increase participation, it is worth considering how to address such concerns.

Reasons why companies have not set a near-term science-based or science-aligned target	Number	Percent
Company is in the process of developing a target	30	64%
Company says it is not yet able to accurately measure Scope 1 & 2 emissions	7	15%
If no target, why? - We do not think we'd be able to make meaningful progress on a near-term target	0	0%
If no target, why? - Other (please specify)	16	34%
TOTAL	47	100%

Reasons why companies did not submit near-term target to SBTi	Number	Percent
Lack of resources to support the verification process	5	16%
Cost to set a target is too high	2	6%
SBTi's standards are too rigid	8	26%
SBTi does not allow carbon credits to count towards emission reductions for near-term targets	3	10%
We prefer a different standard	6	19%
Other (please specify)	15	48%
TOTAL	31	100%

Below is a combination of write-in reasons why companies have either not set a near-term target – or set one, but not submitted their target to SBTi by industry.

Industry	Interviewee Commentary
Financial Services	• "Bank industry focuses on NZBA" • "Concerns about a part of the standard being counterproductive."
Food, Beverage, Agriculture	• The new SBTi FLAG guidance is problematic and are weighing options

Fossil Fuels	• Don't have control over Scope 3 emissions • No SBTi guidelines for the sector • No SBTi guidelines for the sector (4 respondents)
Infrastructure	• *"SBTi is not accepting commitments from companies linked to the O&G industry"*
Manufacturing	• *"SBTi cement and lime sector target guidance were not available at the time our targets were established. Our targets are aligned to other sector targets, namely, Global Cement and Concrete Association (GCCA)"* • No SBTi guidelines for the sector
Materials	• No SBT guidelines for the chemical industry • No SBT guidelines for the chemical industry • Plan to submit within the next 4 months
Power Generation	• Depends on government policies (US based company) • We have set aspirations; but not specific targets for 2035; need additional technologies in utility sector
Real Estate	• *"SBTi is considering requiring Scope 2 emissions be calculated using the location-based method only"*
Services	• Completing measurement of Scope 1, 2, 3 emissions • "More than 50% of our turn-over coming from Oil & Gas."
Transportation Services	• "Fossil fuel revenues greater than the SBTi allowance" • "Waiting on finalisation of global Scope 3 survey" • "We are waiting on the final guidance for a 1.5 degree scenario and are also working to influence their position on carbon-negative SAF" • "We haven't included Scope 3 in our target yet" • "We submitted for validation but withdrew due to requirement to add downstream emissions for transported fuels"

KEY

- Company has not set an SBT (and has no plans to within the next 2 years)
- Company plans to set a SBT within 2 years
- Company has an SBT, but has not submitted this target to SBTi

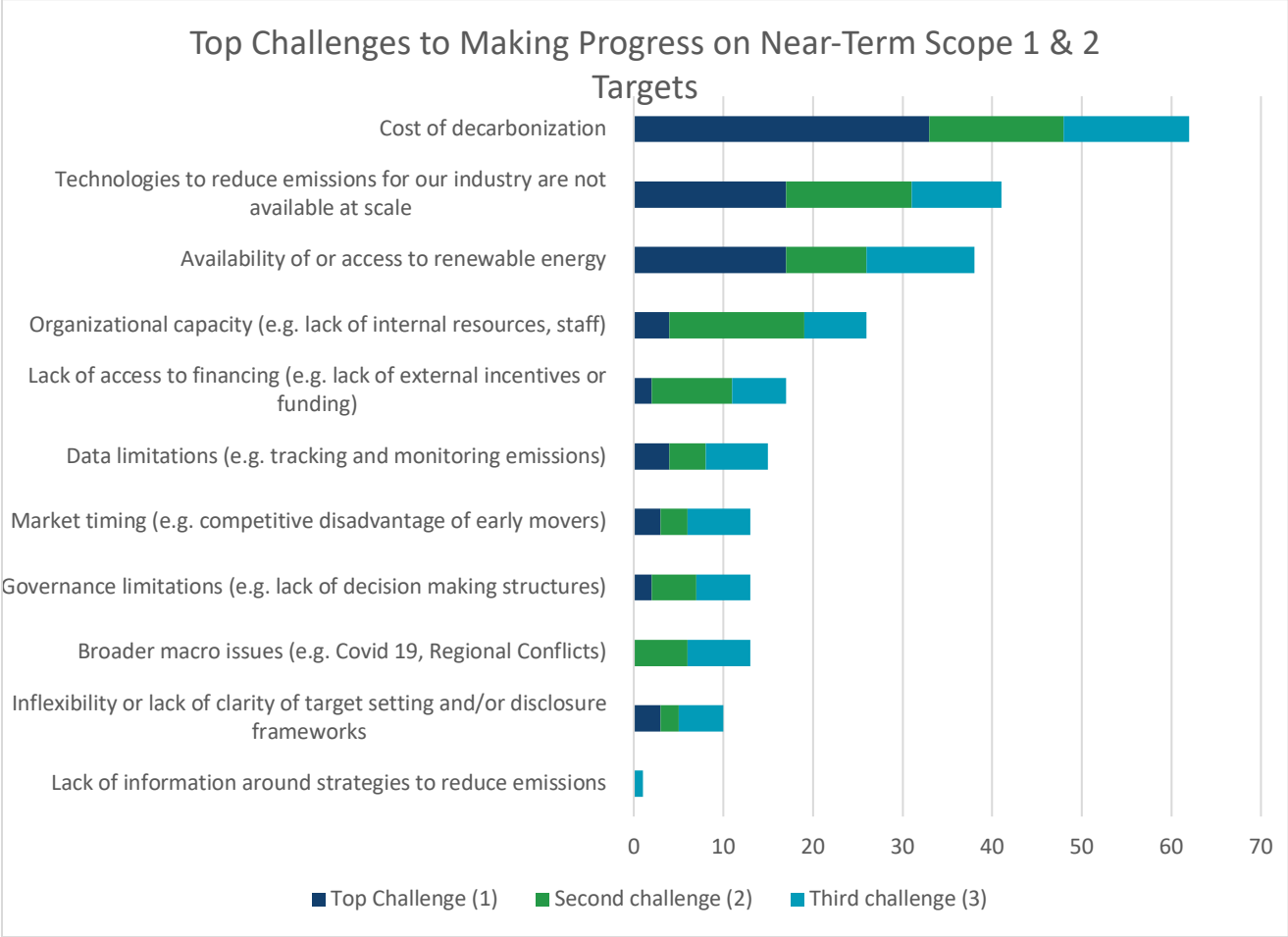
Most companies measure their near-term targets in absolute emissions.

- Scope 1 & 2
  - 81% are measured in absolute emissions
  - 18% use emission intensity
- Scope 3
  - 55% are measured in absolute emissions
  - 36% use emission intensity
  - 9% said other (3 of 5 companies that said "other" use supplier engagement metrics)

Scope 1 & 2 Insights

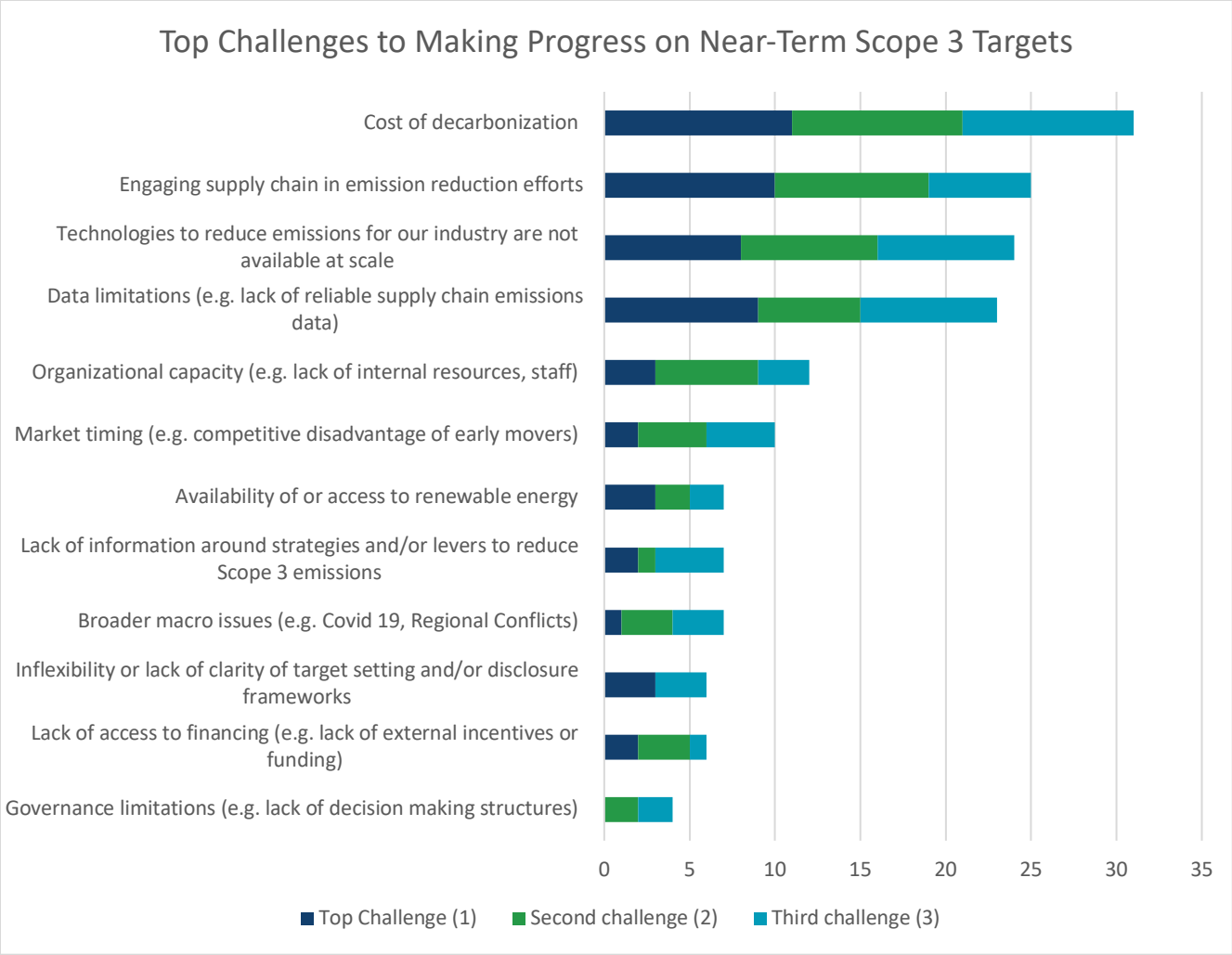
- **70% (62) of 87 companies that set a near-term science-based target said they've faced critical challenges in making progress on these goals.**
  - Of those 62 facing critical challenges, the majority (53) still said that they're making meaningful progress towards their targets.

- 30% said they've not faced any critical challenges to **making progress on these goals**.



Scope 3 Insights

- Over half (60%) of respondents said that Scope 3 emissions account for more than 75% of their company's total emissions. Notably, 9% said they were unsure what percent of their company's total emissions were Scope 3.
- Only 40% (58) of survey respondents have set a near-term Scope 3 SBT.
- 93% (54) of such respondents said they faced critical challenges making progress on these goals. Of these 54 respondents, just over half (55%) say they are still making meaningful progress, while 44% say they are struggling to do so.
    - 7% (4) said they've not faced any critical challenges to making progress on their climate goals.



Participation in the Voluntary Carbon Market

- **55 (41%) of respondents had purchased carbon credits in the past two years.**
- **81 (60%) of respondents have either purchased carbon credits in the past two years or plan to do so before 2030.** The reasons these companies gave for such a decision are outlined in the chart below.

Primary Reasons for Purchasing Carbon Credits (n= 81) (Select one)	Number	Percent
To address hard-to-abate operational (Scope 1 & 2) emissions	35	43%
To address hard-to-abate Scope 3 emissions	13	16%
To provide funding and momentum for climate mitigation outside our company's value chain	12	15%
Pressure from external stakeholders (e.g. consumers or investors)	3	4%
Peer organizations have purchased carbon credits, setting a standard for us to follow	1	1%
Other (please specify)	18	22%

Total	**81**	**100%**

"Other" responses by industry:

Industry	Interviewee Commentary
Financial Services	• *"Carbon Neutral Event Certification"* • *"To finance climate & social projects equivalent to the size of our own emissions, we try to refer from using the term offset or compensation."*
Fossil Fuels	• *"Customer cargoes and to bring momentum to carbon credit market"* • *"In accordance with the carbon offsets allowance under South African Carbon Tax Act"* • *"In accordance with the carbon offsets allowance under South African Carbon Tax Act"*
Infrastructure	• *"to be carbon neutral on Scope 1&2 as we transition to zero"*
Manufacturing	• *"For compliance purposes, for product certification, to offset hard-to-abate operational Scope 1, 2, and 3 emissions."*
Materials	• *"Product lines that can gain eco-premium pricing."* • *"Regulators"* • *"Small volume as part of ETS compliance. Aside from that, no plans for carbon offsets for our interim targets given they are not allowed under SBTi rules."* • *"Still to be determined"*
Power Generation	• *"Dependent on government policies."*
Real Estate	• *"Cost of electrification has made it difficult to decarbonization steam buildings"*
Retail	• *"Product brand claims (not organizational emissions reduction targets)"* • *"We use our purchases as a paralleling strategy to our absolute emissions reduction initiatives."*
Services	• *"All of the above"* • *"Supporting environmental justice organizations and innovative projects"*
Transportation Services	• *"Purchased on behalf of our customers to offset their Scope 3"*

- **53 respondents (40%) have not purchased carbon credits and either have no plans to do so or are undecided when they will purchase.**

What has deterred purchase of carbon credits? (n=53) (Select all that apply)	Number	Percent
We do not intend to purchase carbon credits until we've made further progress on/achieved our net zero commitments so they can be used to neutralize residual emissions	36	68%
Concern over claims of greenwashing	30	57%
Lack of standardization and guidance around high-quality credits	27	51%
Carbon credits would not count toward our SBTi commitments	20	38%
No perceived competitive advantage to purchasing carbon credits	20	38%
Lack of financial resources or allocated funds to purchase carbon credits	14	26%

Other (please specify)	7	13%
Total	**53**	**100%**

"Other" responses by industry

Industry	Interviewee Commentary
Food, Beverage & Agriculture	• *"We have our own forests, and we have insetting projects, and analyzing the option of carbon offsetting."* • *"We sequester/reduce more CO2 than we emit, as such we are seeking to register and sell credits or produce a verified carbon statement attesting to our CO2 net position."*
Materials	• *Resources for climate action are limited and we prioritize reduction, according to SBTi*
Services	• *"This a new space for us, we need more capacity support."*
Transportation	• *"Near term focus on avoidance and shift to lower carbon energy"* • *"Philosophy that carbon credits is the last resort to mitigate generated emissions - we have to eliminate or minimize them first and only then look at some compensating measures"*

Insights on whether they'd be able to make a VCMI Claim

- **Few respondents meet Steps 3 & 4 of the VCMI foundational criteria.** Just 14% of respondents have SBTi validated near-term targets and said they are making progress on both Scope 1 & 2 and Scope 3 targets.

  Note that this percentage may be higher than the percentages found by Trove and BCG (current parallel contributors to VCMI analysis). Several factors could have impacted this discrepancy. We reached out to ~3,600 companies and had only ~145 respondents. It's likely that organizations with a near-term climate target would be more likely to take the survey.

- 70% of respondents said that the use of carbon credits to make progress on a climate target, under specific eligibility criteria to enable a certain degree of flexibility, would increase the likelihood that their company would set/maintain a science-based target.
  - 43% said yes, likely
  - 27% said, yes, very likely
  - 30% said it would not

Estimated Cost to Reduce Emissions

Respondents were asked to estimate the cost of reducing emissions for their organization.

The following two charts depict the approximate unit cost of reducing Scope 1 & 2 emissions:

Cost to decarbonize (Scope 1 & 2)	$0-20 $/tCO2	$20-50 $/tCO2	$50-100 $/tCO2	$100-200 $/tCO2	$200-500 $/tCO2	> $500 $/tCO2	Unknown	TOTAL Respondents

0-25% reduction from present day emissions	17	14	10	10	2	5	54	112
26 - 50% reduction from present day emissions	9	12	11	9	9	5	56	111
51 - 75% reduction from present day emissions	3	9	7	14	9	12	59	113
76 - 90% reduction from present day emissions	1	5	6	10	7	16	67	112

Cost to decarbonize (Scope 1 & 2) - Percent of those that specified a cost	**$0-20 $/tCO2**	**$20-50 $/tCO2**	**$50-100 $/tCO2**	**$100-200 $/tCO2**	**$200-500 $/tCO2**	**> $500 $/tCO2**
0-25% reduction from present day emissions	29%	24%	17%	17%	3%	9%
26 - 50% reduction from present day emissions	16%	22%	20%	16%	16%	9%
51 - 75% reduction from present day emissions	6%	17%	13%	26%	17%	22%
76 - 90% reduction from present day emissions	2%	11%	13%	22%	16%	36%

The following two charts depict the approximate unit cost of reducing Scope 3 emissions:

Cost to decarbonize (Scope 3)	**$0-20 $/tCO2**	**$20-50 $/tCO2**	**$50-100 $/tCO2**	**$100-200 $/tCO2**	**$200-500 $/tCO2**	**> $500 $/tCO2**	**Unknown**	**TOTAL Respondents**
0-25% reduction from present day emissions	5	8	10	6	8	4	69	110
26 - 50% reduction from present day emissions	1	6	5	12	6	5	74	109
51 - 75% reduction from present day emissions	0	2	5	6	9	7	79	108
76 - 90% reduction from present day emissions	0	2	1	8	6	10	84	111

Cost to decarbonize (Scope 3) - Percent of those that specified a cost	$0-20 $/tCO2	$20-50 $/tCO2	$50-100 $/tCO2	$100-200 $/tCO2	$200-500 $/tCO2	> $500 $/tCO2
0-25% reduction from present day emissions	12%	20%	24%	15%	20%	10%
26 - 50% reduction from present day emissions	3%	17%	14%	34%	17%	14%
51 - 75% reduction from present day emissions	0%	7%	17%	21%	31%	24%
76 - 90% reduction from present day emissions	0%	7%	4%	30%	22%	37%

C. Obstacles Analysis: High-Touch Interview Findings

We conducted interviews with 16 companies that participated in the survey. Key findings from these conversations are outlined below.

This table outlines the industries and regions of the companies interviewed.

Industries	Total	N. America	Europe	Africa	Asia
Apparel					
Biotech, Healthcare, Pharma	**1**	1			
Financial Services	**2**	1	1		
Food, Beverage & Agriculture					
Fossil Fuels	**2**	1			1
Hospitality					
Infrastructure					
Manufacturing	**1**		1		
Materials	**5**	1	3	1	
Power Generation					
Real Estate	**2**	2			
Retail	**1**	1			
Services	**1**	1			
Transportation Services	**1**	1			
TOTAL	**16**	**9**	**5**	**2**	**1**

One determining factor that impacts whether an organization meets the VCMI Foundational Criteria is whether they have a validated SBTi target. Therefore, it was interesting to explore the answers of companies that have a validated SBTi target versus those that do not.

6 out of 16 companies had at least submitted a letter of commitment to SBTi (5 of those companies had a validated target).

- Two of these companies (one in retail; one in real estate) were against participating in the VCM because they aligned with SBTi. These organizations said multiple times that SBTi wouldn't allow credits to count towards their targets, and that they wanted to focus on decarbonization efforts instead. Even when discussing Beyond Value Chain Mitigation (BVCM), the real estate company said, "If we're going to spend money on carbon offsets, why wouldn't we just spend that on the building itself?" Additionally, all three companies stressed the uncertainty of the voluntary carbon market.
- The third company with a validated SBT (materials - paper) seemed more open to carbon credits. This was one of the few companies we interviewed that said they're not on track to meet their near-term Scope 1 & 2 targets. They were interested in a lower claim tier that would allow some flexibility to use credits toward progress on a near-term target. Notably, they said they were more interested in investing in carbon capture within their own factories to create credits instead of purchasing credits from the market.
- The fourth and fifth companies (materials) had concerns about the VCM, but weren't completely against purchasing carbon credits.
- The sixth company, in the services (technology) industry, had submitted a letter of commitment to SBTi.
- Only one of these companies (retail) said that they had a Scope 3 target and were making progress on this target.
- Only one of these companies (retail) had a net zero target.
- Not one of these companies thought they could afford to purchase enough high-quality credits to offset 20% of their remaining emissions to make a VCMI Silver Tier Claim.

10 out of 16 companies did not have an SBTi target

- Two of these companies did not have a near-term target.
    - One company (healthcare) had not yet finished measuring their Scope 1, 2, and 3 targets, and therefore had not yet set a target, but aimed to do so in the next year. They mentioned that as a healthcare organization, they did not feel as much pressure to reduce their emissions because they were seen as a mission-oriented organization. This company had not heard of SBTi or VCMI.
    - The other company was in the industrial manufacturing industry and did not yet have a target but was committed to developing one in 2 years.
- The remaining eight companies had near-term targets but had not submitted them to SBTi because of industry-specific limitations.

- Two companies were in the fossil-fuel industry therefore not able to make an SBTi commitment.
- Two in the materials (chemicals) industry felt they did not have sufficient guidance from SBTi for their industry to make a commitment.
- Two companies were in the financial sector and said that SBTi's standards were too rigid; instead, they aligned with the Net Zero Banking Alliance (NZBA).
- One company in the transportation industry (an airline) said that one of the main reasons they didn't submit a target to SBTi was because of their stance on carbon-negative sustainability aviation fuel (SAF), which played a significant role in this organization's decarbonization strategy. They based their target on the International Energy Agency (IEA)'s Energy Technology Perspectives and plan to have their target assessed by the Transition Pathway Initiative. They mentioned they are still considering aligning with SBTi in the future.
- One company in real estate said they had not submitted to SBTi because of SBTi's proposed guidance that would require companies in the building sector to report and measure emissions on a "location-based" accounting standard instead of "market-based" accounting. (Notably, the other real estate company we interviewed—which did have an SBTi target—said they'd "gracefully bow out" of SBTi if the proposed guidance was finalized due to the "location-based" accounting stipulation.)

It's interesting to note that even companies that did not have an SBTi target still referenced SBTi's standards when discussing their company's position on carbon credits. Companies still tried to align with SBTi guidance, or felt that SBTi's stance on carbon credits strongly influenced public perception.

- *"How anti-offset SBTi was has made it very confusing for corporates to invest in offsets."* (Airline industry, North America)
- *"I try to align my advice with external best practices and guidance (e.g. SBTi, Oxford Principles) and SBTi is clear that you can use offsets for 10% of emissions – after you've reduced the rest of your emissions."* (Fossil-fuel industry, North America)
- *"We're exploring nature-based solutions as a potential offset – but we'd only do this for maximum 10% of our emissions, and only after 2030."* (Fossil-fuel industry, Asia)

9 out of 16 companies had purchased carbon credits.

- Real Estate – Only purchased carbon credits for the corporate side of their portfolio.
- Transportation (Airline) – Carbon credits were originally a key part of their climate strategy, but earlier this year (in response to significant scrutiny on the role of offsets, lawsuits on carbon-neutral claims, and pressure from investors) they drastically changed their strategy and backed away from offsets.
- Real Estate – Just bought their first carbon credit, but it was just to comply with NY Local Law 97 and they do not plan to publicize this.
- Fossil Fuel – Only purchased carbon credits to comply with certain Canadian regulations.

- Financial Services – This company does purchase carbon credits but finds that the availability of high-quality carbon credits are limited.
- Materials (Chemicals) – For this company, there was a large need for carbon credits driven by South African carbon tax requirements, and there is a low supply as these must be purchased from within South Africa. Their main barrier to making a claim is the lack of approved SBTi methodology for their sector. They have developed an internal quality assurance process for setting targets so that they can be engaged in decarbonization, but have been criticized for this since it gives the appearance that they are biased. They also noted that being located in the Global South, which lacks tax-credit programs like the IRA or EU Green Deal, means they have an additional financial burden for retrofitting and abatement. They noted that added flexibility around target validation, and more clarity on what it means to be "on-track" could enable participation.
- Services - Purchasing credits primarily due to customer pressure around Scope 2. They do not intend to address Scope 3 through credits due to the very high cost. They noted frustration with the many frameworks and a lack of coordination (VCMI, SBTi, etc.), and stated that they would purchase more credits if standards were clearer and more reliable.
- Materials (Metal & Mining) - They have purchased some credits in the past, but not at scale. They are considering centralizing and institutionalizing carbon credit purchases, but have not made significant purchases yet, and are still assessing options, and focusing on internal reductions first. Their main concerns are around credit quality and avoiding greenwashing accusations. They are more open to using credits for hard-to-abate Scope 3 emissions where they have less control.
- Finance – They want to support the VCM to get climate finance to markets to help develop new technologies. They see the VCM as important in a number of ways - supporting climate finance, supporting markets and supporting new technologies that they otherwise can't directly invest in. Their main concern is the perception that buying credits is not focusing on emissions reductions. There is also the opportunity cost question of where to put the money.

Scope 1 & 2 Challenges

- Fossil Fuels - Projects they're designing now won't be operational until 2030, which is why they're struggling.
- Transportation (Aviation) - The aviation sector will take time, and they likely won't see any large reductions in the next five years, but a lot of work is going on behind the scenes in scaling SAF.

Scope 3 challenges

- Retail - Engaging with suppliers and getting them to do their part
- Fossil Fuels - Can't adequately measure Scope 3 targets. Most suppliers don't have emissions data, are SMEs, and emission reporting is not regulated in their country. (Malaysia)

- Real Estate - Only include certain Scope 3 emissions within their goal (employee-related emissions: business travel, working from home etc.)

Interest in a VCMI Claim

- **Only one company we spoke with (Retail) had SBTi-validated near-term Scope 1&2 and Scope 3 targets, was making progress on both those targets, and had a net zero commitment as well.** This company did not wish to purchase carbon credits, saying it had "very aspirational goals," "SBTi makes it clear you don't procure offsets" and the VCM is too uncertain. They would not be able to afford to purchase enough credits to meet a silver tier and offset 20% of their remaining emissions. This is largely due to the size of their Scope 3 emissions. They don't think this would be possible for any retail company.
- **Most companies we spoke with did not think they could afford to purchase enough high-quality credits to offset at least 20% of their remaining emissions**.
    - Including Scope 3 emissions was the limiting factor.
- **SBTi validation is a limiting factor for many companies.**
    - The VCMI ask to have a "validated" near-term target is too complex – and he doesn't see this company being able to do that. Demonstrating they are "on-track" with their targets is more feasible. (Financial Services)
    - One Fossil Fuels Company based in North America that was unable to make a SBTi claim because of their industry, was hoping that VCMI would provide an opportunity for them to credibly participate in the carbon market, and have verified climate goals. They felt the Code of Practice was a missed opportunity for VCMI to provide real guidance on how to use credits to make progress on targets. This executive could not get leadership on board to invest in carbon credits to make a VCMI claim if it would not count toward progress on their climate goals.

All companies that had a near-term target also cited concerns about the carbon market that deterred participation.

The main concerns mentioned were:

- The uncertainty of the carbon market
- Ensuring the integrity and quality of carbon credits
- Reputational risk and greenwashing
- The value of spending money on carbon credits, (or communicating this value to the C-suite or investors), when those same funds could be used on internal decarbonization efforts.

Some quotes from interviews that speak to the concerns highlighted above:

- *"If we're going to spend money on carbon offsets, why wouldn't we just spend that on the building itself?...We've asked investors if they'd like the to invest in carbon credits, and the resounding answer is 'no.'"* (Real Estate)

- *"How can a company be sure that they're acquiring high-quality carbon credits if the registry is always subject to criticism?"* (Financial Services)
- *"There's stuff in the news that certain carbon credits are a `gold standard,' but there's also a lot out there that says carbon credits aren't good. You could purchase credits to plant trees, but those trees could burn down."* (Retail)
- *"If we're setting a target to manage reputational risk, [using carbon offsets] would undermine this." "Investing in the carbon market – especially for an oil and gas company – is exposing the organization."* (Fossil Fuels)
- *"We are scared about confusion this could raise in terms of our roadmap towards net zero approved by SBTi, and we don't want to end up in the same basket of companies that are just doing BAU [business as usual] and just purchasing credits."* (Materials)
- *"We still need to neutralize un-abatable emissions in the long-term, so there is concern on how to reconcile the opportunity cost of investing in removal, but not for avoidances. How do we make a business case for upper management to agree to it - instead of investing in CCUS [carbon capture, utilization and storage], which is crucial for my industry?"* (Materials)
- *"How do we align with all these frameworks?"* (Materials)
- "*I think it would be more helpful to define 'on-track' over a longer timeline than one year since progress will not be linear, and companies are unlikely to be able to budget for carbon credits in one year but not in the next. Making progress against the target on a 3-year average basis may help smooth out variability, which could be caused by a number of factors, including macroeconomic factors."* (Finance)
- *"We don't expect to be able to state that we are on-track or off-track in the short term since there is some volatility in financed emissions reporting under the PCAF [Partnership for Carbon Accounting Financials] methodology and being on-performance against target may vary from one year to the next. We also need to take into account NZBA and PCAF guidance on how we use carbon credits in respect of our Scope 3 emissions targets."* (Finance)
- "*We can put credits on our trading desk balance sheet like anyone else, but we haven't made a VCMI claim because when we look at the VCMI standard requirements, we couldn't currently make a VCMI claim.*" (Finance – the challenge was related to financial institution primarily using Net Zero Banking Alliance (NZBA) Framework instead of an SBTI commitment.)

VI. Conclusion & Recommendations

A. Synthesis

The literature review highlighted several challenges facing corporate adoption of voluntary carbon markets, including confusion around terminology, concerns about additionality and permanence of credits, high costs and complex supply chains, and lack of regulation and standards enabling potential greenwashing. However, it also underscored the vital role of high-quality credits in enabling companies to mitigate emissions and make progress towards climate goals.

The obstacles analysis via the corporate survey and interviews revealed that most companies are still focused on internal abatement of Scope 1, 2, and 3 emissions. Key barriers deterring voluntary credit purchases include lack of understanding of the value proposition, wariness about claims of greenwashing if used improperly, and alignment with guidance from SBTi that credits should not count toward emissions reduction targets. Even companies interested in purchases faced uncertainties about credit quality assurance.

B. Recommendations

1. **Clearly define the value of participating in the VCM and making a VCMI Claim.** Most companies we spoke with said that it would be difficult to articulate the value of making a VCMI claim or purchasing carbon credits to their board, C-suite, investors, and customers, if those credits did not count towards an emissions goal. Many expressed concerns about using funds that would have gone toward helping them decarbonize and make progress on their targets and instead invest in purchasing carbon credits that wouldn't count towards progress on these targets.

2. **Simplify the language and provide education around the purpose of VCMI Claims and the difference between BVCM and "offsetting."** There seemed to be a lot of hesitation from organizations that aligned with SBTi around purchasing carbon credits. Many companies still view any type of participation in the carbon market as "offsetting" and will reference that carbon offsetting is not allowed under SBTi standards until they've reduced at least 90% of their emissions. Even if we discussed the concept of "beyond value chain mitigation," this still seemed to be a bit confusing to our interviewees. More education is needed around how Beyond Value Chain Mitigation (BVCM) differs from offsetting, and why organizations should contribute. Changing the language to a more simplified terminology such as "offsetting" vs. "non-offsetting" carbon credits (as discussed in Trouwloon et al.) or providing additional context would likely improve understanding and communication between companies and their stakeholders.

3. **Furthermore, this simplified language should be consistent across all standard setting bodies.**

4. **Clearly define foundational requirements and exactly how VCMI Claims align with and are separate from SBTi.**
    - **a.** Companies that align with SBTi are very hesitant to purchase credits in the VCM because the SBTi does not allow carbon credits to count toward emission reduction targets. Although SBTi does encourage BVCM, it was not clear from the interviews that corporates fully comprehend what this means, that SBTi endorses it, or the value of doing so. Therefore, VCMI should consider providing clearer guidance and education on how their claims align with the goals of SBTi. If possible, joint marketing/messaging between the two organizations would likely be beneficial.

b. Companies who do not align with SBTi feel that they are disqualified by making a VCMI claim given the current language. They do not have "validated" targets. Most of these organizations cited industry-specific concerns related to aspects of SBTi's industry-specific guidance (e.g. location-based accounting for the real estate industry, and not approving SAF for the aviation industry) or lack of industry-specific guidance (e.g. financial services and fossil fuel industries). Therefore, VCMI should clearly define what constitutes a "validated science-based target," and whether organizations that don't align with STBi would be able to make a claim – and if so, what they need to do to qualify.
c. Corporate actors need more clarification that purchasing carbon credits is a complementary measure, only to be deployed after rigorous in-setting has been done, and there remains a gap to the target.

5. **Consider lowering the threshold of the percentage of remaining emissions a company would have to offset to achieve a "silver" (or lower-tier) ranking.** Most organizations that we spoke with said they would not be able to afford to compensate for their remaining emissions even if they met all the foundational criteria.

VII. Appendices

A. Details of Literature Review (full review)

- Despite concerns and identified "flaws" of the VCM, as highlighted in the article, the authors contend that 1) the urgency of addressing climate change outweighs the flaws with VCMs and 2) while VCMs are key today, they will subside by 2050 as carbon pricing is built into all market prices. Furthermore, VCMs can allow for innovation and help bridge the gap as we move towards an economy that is more conscious of GHG emissions. (Miltenberger et al. 2021)
- VCM has further growth potential (Howorth, 2022)
    - Paris-specific mechanisms are still finding footing, VCM is an established market that can be scaled significantly and deliver on Paris objectives
    - A report quoted in this paper from the Institute of International Finance projects expansion of both compliance and voluntary carbon markets could more than double their greenhouse gas emissions coverage. By 2030, VCM commitments could grow from covering 9% of corporate emissions to 23%
- Streck highlights the benefits of private participation in VCMs in influencing government action. In particular, she highlights potential funding of climate projects in developing countries, technological developments, opportunities for innovation, and project data to inform government policies. (Streck, 2021)
- Identified benefits of the VCM based on 27 qualitative interviews with market stakeholders: (Blum 2019)
    - Incentives for collaboration among governments, project developers, and the private sector to work together
    - Impact of the Paris accord and the potential to shift away from carbon offsetting towards projects that contribute to NDCs and emission reductions
    - Acknowledging the continued push (although additional progress is needed) for greater standards and checks and balances
    - Benefits of climate action and innovation/learning in developing countries
    - Potential for projects to move away from offsetting for one company or country toward the "greater benefit of the atmosphere"
- Carbon Markets in Agriculture (Kitchens, 2020)
    - The market must incentivize farmers to pursue eco-friendly practices, that can, in turn, lead to greater productivity while mitigating GHG emissions.
    - "[R]ecent political momentum and enormous private sector interest shows that voluntary carbon markets have the potential to serve as one critical tool to enlist farmers, ranchers and landowners in the effort to reduce greenhouse gas emissions and combat climate change."
    - "[R]elatively few producers and landowners have taken advantage of carbon markets to date. This is largely because transaction costs—including costs associated with monitoring, reporting and verifying changes in soil and water quality—are too high. Small farms, in particular, may lack the resources and knowledge to enter the market."

Impact of the Paris Accord on the VCM

- In conversations with 27 stakeholders in the carbon markets, many cited the positive impact that the Paris Accord had, given the potential to shift organizations away from carbon offsetting and towards projects that contribute to NDCs and emission reductions. However, respondents also cited double counting and the shift away from carbon neutrality as concerns about the impact of the Paris Accord on the carbon market. (Blum, 2020)

- One respondent stated, "Carbon neutrality would not work after Paris because 'to reach net zero emissions globally, you cannot compensate in one place and continue in the other.'"
- Paris Agreement updates: Article 6 and Paris Rulebook impact on VCM. The hope is that these updates will increase climate action ambition. (Brown, 2022)
- According to Article 6 of the Paris Agreement, countries and companies can partake in cooperative arrangements to trade emission reductions-internationally transferred mitigation outcomes (ITMOs)-with one another through bilateral or multilateral agreement
- The Paris Rulebook establishes accounting principles to minimize the risk of double counting carbon credits
- Article 6.4 addresses some of the concerns with germinating and trading. Below are some of the concerns:
    - "real, measurable and long-term" emissions reductions,
    - additionality,
    - permanence,
    - reversal of emissions
    - consultation with local communities and the avoidance of negative social impacts
- Lang et al. provide the following opportunities for how the market might adapt in light of the Paris Agreement: (Lang et al., 2018)
    - Using VCMs as an opportunity for private actors to help "fill the gaps left by NDCs;"
    - Repositioning the focus of the VCM to sustainable development/SDGs instead of a focus on emission reductions. This would require a movement away from the notion of "carbon offsets" or "carbon neutrality;"
    - International oversite of voluntary projects by the private sector, which according to the authors, would require clear rules and boundaries and an emission counting mechanism like a carbon registry to avoid double counting.
- Development of further detail of Paris Agreement Article 6 at COP26 calls into question the role of the VCM for future climate action and how VCM and Paris Agreement work together (Howorth, 2022)
    - This paper posits that the Paris Agreement and the VCM should remain two "related but distinct tools for driving climate action"
        - Paris-specific mechanisms are still finding VCM is an established market that can be scaled significantly and deliver on Paris objectives
        - "VCM presents a real opportunity to drive significant climate action and climate finance in the short term and beyond."
        - Clarity is needed - supervisory bodies should continue to clarify how Paris mechanisms are intended to work
- New Zealand's Energy Efficiency and Conservation Authority commissioned the policy research institute "Motu" to investigate alternative approaches for scaling the VCM in accordance with the Paris Agreement (Leining & White, 2021)
    - Dual-pronged approach for organizations to scale climate mitigation outside of their supply chain, either domestically or overseas.
    - A "Carbon Horizon" would encompass shared claims to mitigation in line with the Paris Nationally Determined Contributions.
    - A "Carbon Frontier" would revolve around single claims to mitigation outside of Paris NDCs.
- In line with remarks from articles in this literature review, the authors of this piece highlight some of the challenges that the Paris Agreement posed in the development

of the VCM (e.g. double counting) and recommend that carbon credits should be accounted against the host countries' NDCs. The authors also recommend greater alignment between public and private sectors to collaborate in the development of the VCM. (Kreibich and Hermwille, 2021)

Partnerships/collaboration between public and private sector around the VCM

- Projects funded by private participation in the VCM can influence government action. In particular, there are many benefits from public-private partnerships that help support investments in developing countries, which can push for greater regulation and documentation around climate action. Additionally, data from these projects can improve government support of further climate action thereby influencing policy decisions. (Streck, 2021)
- The agricultural sector has a central role in addressing climate change, and has the potential to create carbon credits through the adoption of climate-friendly farming practices, but needs government support to spur the generation of these carbon credits (Everhart, 2023).
- Importance of Well-Functioning Markets in Unlocking Carbon Offset Opportunities (Rossetti, 2023)
    - The Growing Climate Solutions Act can benefit the U.S. agricultural sector and improve consumer confidence. It encourages engagement with the EU and UN for program implementation. It seeks to avoid "heavy-handed" regulation on corporates participating in VCMs.
        - "…one estimate of the effect of tighter requirements on carbon offsets would increase prices by up to 3,000 percent, indicating that low-quality offsets may have a substantial negative effect on the proper operation of carbon markets, despite a high willingness among consumers to undertake voluntary actions to achieve carbon neutrality."

Concerns about the voluntary carbon market

- Concern cited in a series of interviews with 27 stakeholders on the carbon markets after the Paris Accord: (Blum, 2020)
    - mistrust in carbon markets as a "false solution;"
    - additionality concerns;
    - the potentially harmful or inequitable impact on communities where these projects take place;
    - the discrepancy between standards and what happens on the ground;
    - changes to the market after Paris Accord (e.g. double counting and shift away from carbon neutrality);
    - One respondent stated, "'each project faces the dilemma of proving what would have happened if they would not have existed. An impossibility!"
- UK Green Building Council discusses challenges with the VCM market (Goulding, 2023)
    - Challenges/concerns with carbon credits/offsets:
        - Verification time for certain offset types can occur, for example, five years after the restoration process, delaying the availability of these credits.
        - The uncertainty of sequestration in the case of Pending Issuance Units (PIUs), as the sequestration is not guaranteed until verified, poses a challenge for long-term planning.
        - Carbon insetting can be challenging to implement within an organization's value chain and may require substantial investment

        - Regulatory changes in the near future can potentially affect the mechanisms for driving decarbonization
        - Organizations need to navigate the nuances of different carbon standards and ensure that their chosen offset projects align with their specific carbon goals and priorities.
    - Risks to emissions impact
        - Additionality
        - Permanence
        - Robust quantification of emissions reductions and removals
        - No double counting
- Risks and Opportunities in Voluntary Carbon Markets (Cleary Gottlieb, 2022)
    - Quality of projects in the voluntary carbon market varies widely as VCM remains unregulated. Best practice is to have projects verified by third-party agencies.
    - Many carbon projects based in global South
        - Benefits: High potential for economic nature-based emissions reduction projects
        - Conflicts: Land use and access challenges harming livelihoods of indigenous groups. Local communities evicted from lands
- The biggest challenges with the VCM are scaling, regulation, and transparency (White & Case, LLP, 2023)
    - Innovations to aid in scaling and increasing transparency of the VCM include:
        - Sovereign governments issuing carbon credits with they exceed NDCs
        - "Carbonplace" - Developed by banks, a settlement platform for purchase of offsets
        - Companies who buy carbon credits becoming involved in creation of project
- Problems and Potential Solutions in the VCM (L, Inside carbon markets: Problems, causes, and potential solutions 2023)
    - "Carbon Cowboys" buy carbon credits in the Global South for far less than their value, then dramatically increase the profits by selling to buyers in developed countries.
    - "90% of the intermediaries don't reveal the exact fees or profits they earned from selling carbon credits on the VCM"
    - Solutions to profit-seeking credit sellers:
        - High-level transparency and accountability
        - Minimum price floors
        - International Governance Framework
- The Forestry Sector represents a large portion of projects in the VCM but remains the most difficult sector to determine sequestration levels and credit efficacy.
    - Improved Forest Management (IFM) opportunities (Haya et al., 2023)
        - Forest restoration
        - Increased stand productivity through changed management
        - Conservation of ecologically important forests
        - Extended rotations of working forestlands
        - Reduced-impact logging
    - Baseline credibility concerns in forestry offset projects (Haya et al., 2023)
        - Establishing baselines below initial or historic carbon stocks raises over-crediting concerns.
        - Using net-present value to set baselines should only be used if project developers can demonstrate a history of NPV-type harvest schedules.
        - Dynamic baselines are valuable where land use patterns and markets are constantly evolving

    - Study examining 3 categorizations of obstacles to scaling the VCM for 4 major carbon registries (Pan et al., 2022)
        - Methodology
            - Additionality
            - Permanence
            - Leakage
        - Socio-economic
            - Opportunity costs
            - Social costs
            - Transaction costs
        - Implementation
            - Monitoring
            - Reporting
- Competing VCM standards and low carbon credit prices have created barriers to market industry for the agricultural sector (Everhart, 2023).
- The problem with placing too much responsibility on local governments to govern VCM projects and community rights. (Krishnan, 2023)
    - "Although the Ecuadorian constitution contains provisions that seem to protect against exploitative carbon market programs, carbon market proponents have found ways to circumvent these protections."
    - Forest carbon markets ignore problems of land rights, power relations, and building trust among communities.
- Greenwashing concerns about climate claims that include the use of "offsets." (Krishnan, 2023)
    - Concern with some of the biggest polluters like Amazon making net zero commitments largely based off carbon offsets. However, the belief is that the offsets are being exaggerated and impact is lower than what is being presented.
    - Concern that carbon credits allow companies and wealthy countries to underpay for carbon credits and exaggerate the impact they are making to fight climate change.
- Concern about the price of carbon credits. (Krishnan, 2023)
    - Concern that carbon pricing is too low, specifically mentioning LEAF projects as an example. "LEAF projects' minimum carbon credit price will be $10. This is a fraction of the proper price, which is closer to $100, that many climate economists target in order to achieve net zero by 2050."
- Greenwashing undermines climate mitigation in 2 main ways with lawsuits as a potential consequence: (Trouwloon, 2023)
    - it can extend the lifelines of "dirty businesses"
    - it "can deceive consumers, investors and policy makers into unwittingly accepting polluting practices [53], which leads to an over- estimation of the amount of climate mitigation action taking place and an underestimation of global carbon emissions."
    - Growing number of CSR lawsuits in the US. "The issuance of carbon credits by leading voluntary carbon market registries—including Verra's Verified Carbon Standard, the Gold Standard's SustainCert, the American Carbon Registry, the Climate Action Reserve, Plan Vivo, the Global Carbon Council and Climate Forward— increased rapidly during this period, growing almost fivefold from 75 million credits issued in 2018 to 354 million credits issued in 2021. This number then decreased again somewhat to 279 million in 2022"
- Trading of emissions can result in entities passing responsibilities to reduce emissions of their own onto others, a phenomenon known as the "collective sacrifice concern." (Trouwloon, 2023)
- Identified concerns of the VCM based on 27 qualitative interviews with market stakeholders: (Blum, 2019)

    - mistrust in carbon markets as a "false solution;"
    - additionality concerns;
    - the potentially harmful or inequitable impact on communities where these projects take place;
    - the discrepancy between standards and what happens on the ground;
    - changes to the market after Paris Accord (e.g. double counting and shift away from carbon neutrality);
    - While some stakeholders are quite skeptical that carbon markets can contribute to addressing the climate crisis, most interviewees believe they can be a valuable tool.
- Governance of Eco-Labels: Expert Opinion and Media Coverage (Castka and Corbett 2016)
    - Vendors in the VCM should be concerned about negative media coverage of the market itself. The media tends to report more favorably on eco-labels that have multiple assurance practices in place.
    - The media has tended to report more favorably on some assurance practices such as third-party certified claims, disclosures, and open- and consensus-based standard setting.
        - "First- and second-party certifications are not credible, due to inherent conflicts of interest, implying that standards that require third-party certification are superior to those where it is optional…"
- Carbon allowances and the demand for offsets: a comprehensive assessment of imperfect substitutes (Dormady and Englander 2016)
    - Regulatory frameworks, transaction costs, governance uncertainty, and risk factors obfuscate the goal of carbon offsets use to drive GHG emission reduction.
        - "Carbon allowances and carbon offsets, despite being statutorily substitutable, behave in practice like imperfect substitutes."
        - "…due to the features of policy design and external market influences…, offsets have been consistently discounted relative to allowances - at present by a margin between 30% in California and 5,000% in Europe."
        - "Simply put, firms would prefer to hold allowances rather than offsets in their portfolio by a significant margin, even though both are permissible for purposes of programme compliance."

Regional considerations on participation in the VCM

- **United Kingdom** – Green Building Council (UKGBC) discusses the challenge with the limited availability of local offsets. (Goulding, 2023)
    - The limited availability of UK-based offsets can make it challenging for organizations seeking to offset their emissions locally. (This is region-specific, but likely a problem in most of Europe and the US)
- **Nordic Countries** – (Nordic Council of Ministers, 2022)
    - This report provides a tangible example of one of the VCM opportunities highlighted in other articles in this literature review – that VCMs can facilitate collaboration between governments and non-state actors around climate action, especially in line with the Paris Accord.
    - The Nordic Code of Best Practice for the Voluntary Use of Carbon Credits ("the Code") is quite similar to VCMI's claims code, but expands to consider how voluntary use of carbon credits can contribute to national mitigation contributions as well.
    - The document outlines 4 recommendations to promote best practices for the voluntary use of carbon credits: 1. Create a community of best-practice; 2. build capacity by raising awareness of key issues and provide knowledge and support; 3.

Align and update guidance to fit international standards; 4. Explore key challenges and support implementation of best practices

- **Thailand** – Premium Thailand Voluntary Emission Reduction Program (or Premium T-VER) (SRPP, 2023)
    - This article provides a high-level overview of Thailand's T-VER, which was published in January of 2023 and provides guidance around advancing Thailand's climate neutral commitment and carbon market. The "Premium" aspect of the T-VER program refers to organizations that are voluntarily reducing emissions outside of their value chain at a higher standard, including through the purchase of high-quality carbon credits.
    - One of the goals of the Premium T-VER program was to try to align Thailand's standards for their carbon market with international guidance.
    - Premium T-VER standards for registration include demonstrating that participation won't be double-counted and ensuring a project reduces GHGs beyond business-as-usual, receives third-party verification, contributes to SDGs, has public consultations and addresses safety concerns.
    - Projects in Thailand are also able to join other carbon crediting programs, such as Verra VCS.
- **Africa** (African Carbon Market Initiative, 2022)
    - The African Carbon Markets Initiative was launched at COP27 in Egypt with the support of a coalition of organizations to "scale supply and demand for African carbon credits." This report serves as a guide for how VCMs could contribute to Africa's energy transition and drive broader development.
    - Key challenges identified: fragmented projects, lack of large-scale developers with the resources to manage these projects, an uncertain regulatory landscape, and the questioned integrity of the carbon credit market.
    - Identified core objectives: Grow African carbon credit retirements, create or support 30 million jobs by 2030 to project development and monitoring, raise the quality and integrity of African credits, ensure equitable and transparent revenue distribution.
- **Canada** - Canada's Carbon Tax Hike and Strategic Implications for Oil & Gas Firms (Ihejirika 2021)
    - Canadian local, provincial, and national carbon tax programs are forcing the issue for oil & gas companies to diversify their business streams, invest in renewables, and cut emissions altogether.
    - Robust carbon taxes have driven oil & gas companies to invest in renewables. This investment alone isn't enough to meet provincial-level climate goals, let alone Canada's NDCs. As a result, oil & gas firms are turning to the VCM.

Studies/findings that indicate that greater participation in the VCM will decrease the ambition/progress of corporate climate action

- VCM offers a cheap "out" for companies and governments and may result in continued pollution and delayed reductions. (Trouwloon, 2023)
    - "While there are no data or studies that link voluntary carbon market activities to a decrease (or increase) in climate ambition in a certain country, corporate actors may indeed claim emission reductions and removals that would have happened at a later stage through public policies. Then climate benefits are claimed twice, once toward a corporate climate target and once toward a government goal under the Paris Agreement. In such cases a corporate claim that suggests that an investment in carbon

credits has lowered global emissions cannot be guaranteed, leading to an overestimation of the extent of climate action that has taken place."

Corporate perspectives on VCM

- Microsoft has committed to being carbon-negative by 2030 and sees itself as a pioneer in the corporate VCM space. (Microsoft, 2021)
    - Climate commitments: Carbon negative by 2030. By 2050, remove from the atmosphere the equivalent of all carbon emissions associated with Microsoft operations and electricity procurement from the time the company first started, in 1975.
    - Driver: IPCC Special Report is the main driver of ambition or main driver for pursuing carbon credits on top of decarbonization efforts
    - Identified a need in VCM
    - Need for standard definitions of additionality, leakage, and durability
    - Need for better thresholds of key removal concepts, like how to account for removal consistently across diverse project types, and how corporations can credibly claim credit for funding removal outcomes
    - What makes an ideal direct air capture project?
        - Net negativity
        - Affordability
        - Use of zero-carbon energy
        - Responsible storage of CO2, including ongoing monitoring for geological storage
        - Existence of a risk mitigation covenant recorded in relevant jurisdictions
    - What makes an ideal forestry project?
        - Clear, conservative baseline and additionality
        - Distinction between carbon removal and avoided emissions
        - Sufficient accounting for activity and market leakages
        - Strong risk management recourse provisions
        - Uses technology for monitoring and verification
    - What makes an ideal soil project?
        - Baseline and verification in-soil sample measurements to supplement modeling, aiming for 30-50cm depth in long term
        - Distinct and measured tallies of removal and avoided emissions
        - Net-negativity claims account for all programs inputs/outputs (such as fertilizer)
        - Ecologically sustainable farming practices
        - Democratization and equity for farmers
    - What makes an ideal biochar project?
        - Net negativity claims include full life-cycle assessment
        - Reliable availability of sustainable feedstock with 10-20% moisture and high lignin content
        - Safe and appropriate disposal of biochar to avoid any human health hazard
- Like Microsoft, Amazon sees itself as a pioneer in the corporate VCM space. (Amazon, 2021)
    - Climate Commitments: Net zero by 2040
    - Driver: IPCC Special Report is the main driver of ambition or main driver for pursuing carbon credits on top of decarbonization efforts
    - Focusing on nature-based solutions right now but they are investing in businesses with promising technologies

    - Mention that the characteristics of a high-quality carbon credit are additional, quantifiable, real, permanent, and socially beneficial.
    - Concerns/questions to assess while evaluating projects in the VCM:
        - Will it occur without additional funding?
        - Is the measurement accurate? Is it estimated data or field measurement data?
        - Is there leakage? Does the project have countermeasures to account for leakage? Is the leakage being displaced?
        - How are you assuring permanence?
- Netflix discusses its approach to achieving net zero emissions (Stewart, 2021)
    - Climate commitments: Net zero by the end of 2022 and every year thereafter
    - Driver: IPCC Special Report is the main driver of ambition or main driver for pursuing carbon credits on top of decarbonization efforts
    - 3 step process to Net Zero with additional considerations for 2 & 3
        - Reduce emissions
        - Retain existing carbon storage: Conserving at-risk natural areas like tropical forests
        - Remove carbon from atmosphere: Regeneration of critical natural ecosystems
    - 5 step carbon credit project screening criteria
        - Screen 1: Competitive selection
        - Screen 2: Meet core quality criteria: "Must meet globally recognized core quality criteria: they must be additional, verified, based on a realistic baseline, not double counted, and issued by a credible standard that has robust provisions in place to address permanence (the risk of reversal) and leakage (the risk of displacing emissions from one location to another)."
        - Screen 3: Deep project-level diligence and impact screening
        - Screen 4: Use digital tools and resources to improve visibility
        - Screen 5: Seek additional expert advice
- Disney's commitment to environmental stewardship and efforts to reduce greenhouse gas emissions (Disney, 2019)
    - Climate commitments: Net Zero by 2030 for Scope 1 and 2 emissions
    - Driver: Reference IPCC as a main driver for their net zero commitment
        - References Proceedings of the National Academy of Sciences (PNAS) as it found "nature-based solutions for sequestration have the ability to achieve up to 37% of the emissions mitigation required to limit carbon dioxide concentration in the atmosphere."
    - Disney invests in various NCS projects, such as reforestation, improved forest management, and reduced emissions from avoided deforestation. These projects generate carbon credits, which represent reductions in greenhouse gas emissions. Disney emphasizes the need for these credits to meet specific criteria:
        - Additional: Projects must not be a result of regulatory obligations but should only occur with carbon credit revenues.
        - Quantifiable: They use scientific peer-reviewed methodologies to quantify carbon credits.
        - Verifiable: Third-party audits are required to certify emission reductions.
        - Permanent: Carbon emission reductions should be irreversible, and mechanisms are in place to address reversals.
    - The paper mentions some risks associated with carbon credit projects:
        - Project Management Risks: The paper mentions risks associated with project management, which may include issues related to the execution, monitoring, and successful completion of NCS projects. These risks can include

unexpected difficulties in project implementation, geopolitical challenges in project regions, or unanticipated natural events like pests or natural disasters.
        - Carbon credit reversal risks: carbon credit reversals due to natural disasters or unauthorized activities like tree cutting, which could potentially undo the emissions reductions achieved by NCS projects. To mitigate this, they mention that projects have mechanisms in place, including contributing issued credits into a buffer pool as insurance.
        - Community consent risks
- Schroder Real Estate is new to the "offsets" space and still has a lot of questions around it. (Schroders, 2020)
    - Climate Commitment: Committed to Net-Zero Carbon by 2050
    - Driver: References 2015 Paris Agreement as main driver for carbon budget and net-zero target
        - Name investors as another driver
    - Their focus for offsets is on short to medium term, but they see long term value as well
    - Their standards and accounting principles for carbon credits are the right approach, but they are far behind companies like Microsoft, Amazon, and Netflix that are much more knowledgeable about the topic
    - They discuss two seemingly different definitions of net zero, highlighting the lack of consistency with terminology
    - "Schroder Real Estate has adopted the BBP Net Zero Carbon Pathway Framework definition of Net Zero Carbon, which is described in its simplest form as: `When the carbon emissions emitted as a result of all activities associated with the development, ownership and servicing of a building are zero or negative.' The BBP Commitment recognizes that net zero carbon should be addressed for both operational and embodied carbon."
    - "Net Zero Carbon is achieved through applying the principles of the energy hierarchy, as outlined in section 6, to reduce energy demand, increase energy efficiency, include renewable energy sources, and finally offset remaining carbon."
        - They are setting "An internal carbon price (£ or €/tCO2e) [that] will be considered as a means to motivate embodied carbon mitigation during design. We may use carbon offsets where deemed appropriate."
- CBRE discusses strategies and approaches for reducing carbon emissions in the commercial real estate sector. (CBRE, 2023)
    - Suggests a 6-phase process for decarbonization
        - Establish your decarbonization strategy
        - Continuously improve energy efficiency
        - Electrify real estate and transportation
        - Transition to renewable energy and carbon-free fuels
        - Decarbonizing your supply chain
        - Offsetting your carbon balance
    - Ways to incorporate carbon offsets into your decarbonization approach:
        - As part of a defined strategy with a set scope and percentage of emissions that will be offset
        - With a short, medium and long-term plan for purchasing offsets
        - With ongoing monitoring and reporting on the performance of any offsets purchased
    - Mentions durability, transparency, accountability, and rising costs as risks associated with offsetting
    - It advises seeking credible offset providers with transparency, accountability, and clear accounting of carbon removal.

    - Underscores the importance of measuring and reducing carbon emissions throughout the supply chain and suggests sourcing sustainably and building alliances with companies committed to decarbonization.
    - Emphasizes that carbon offsets should be considered a last resort after all other decarbonization tactics have been exhausted.
- MetLife Investment Management discusses strategies for achieving carbon neutrality in the real estate industry. It emphasizes the importance of addressing carbon emissions and highlights the growing trend of carbon neutrality pledges by real estate companies. (Landau, 2021)
    - References the IPCC definition of net zero when defining carbon neutrality which can be problematic as some entities consider these to be two separate claims
    - One of the initial steps toward carbon neutrality is defining the boundaries of the emissions reduction program and identifying which carbon emissions will be measured and included (Scope 1, 2, and/or 3)
    - Carbon offsets must address concerns around additionality, permanence, carbon leakage, and double-counting
    - Real estate companies should tailor their approach to carbon neutrality based on the types of properties they own. Some properties can eliminate operational emissions entirely with on-site renewable energy, while others may have to rely on RECs and offsets.
    - The paper stresses that achieving carbon neutrality is crucial for sustainability, competitive advantage, and compliance with future regulations.
    - The paper highlights the need for the real estate industry to transition away from traditional investment practices and focus on short-term progress and incremental goals.
    - The paper mentions a number of challenges with achieving carbon neutrality:
        - Data collection from tenant-controlled areas can difficult
        - Embodied carbon cannot be reduced after construction
        - Market volatility of RECs and concern that increased demand will make this problem worse
        - Risks associated with a changing regulatory landscape
        - Property specific challenges that for example, limit access to on-site or community renewable energy
        - Risks involved with climate change and a need for resiliency on top of mitigation
        - Uncertainty around the future of carbon pricing
- Improving consumer awareness of the externalities of just-in-time delivery (Ewing 2020)
    - Delivery methods with lower carbon intensity, demonstrated here by UPS and Cloverly, have become less expensive, and the methods become potentially viable as offsets themselves.
        - "In a study conducted by Isley et al., consumers were more than two times more likely to purchase carbon offsets for Amazon shipping when it was the default option. If the low-carbon, slower shipping option is the default option, consumers are forced to actively consider whether or not they need to opt for a faster shipping option."

B: Survey Responses & Analysis (all responses)

Most respondents (69%) had already set a "science-based" or "science-aligned" target.

- 98 (68%) out of the 145 survey respondents indicated that they had set a near-term science-based or science-aligned target.
- 24 (17%) have committed to developing in the next two years.
- 23 respondents (16%) had not set a science-based target and had no plans to in the next two years.

Consumer goods and real estate industries most likely to have an SBT; Energy-related industries least likely.

- The apparel (n=4) and hospitality (n=4) industries were most likely to have set an SBT (100% of these respondents set an SBT).
- 86% of food, beverage, ag (n=7) and real estate (n=7) had set an SBT.
- Power generation (n=7) and fossil fuel (n=8) were least likely to have an SBT (29%) and (50%) respectively. Additionally, 57% of power generation companies and 38% of fossil fuel companies had no plans to set an SBT in the next two years (57% and 38% respectively.)

TCB Recommendation: We deliberately did not ask the first question about an SBTi-aligned target because VCMI wanted to hear from organizations that may have set targets against another framework. However, many of the responses from companies who did not set a target referenced issues with SBTi. Therefore, a recommendation for VCMI is to include a clear definition of "science-based" targets in the "Foundational Criteria" if companies do not need to have a SBTi-validated target to set a Claim.

Most companies with near-term target align with SBTi. Of the 98 companies who had set a science-based or science-aligned target:

- 69 had at least submitted a letter of commitment to SBTi and 48 already had their near-term targets validated.
- Of those who did not submit to SBTi, 11 said their target aligns with SBTi principles and 18 said their target aligned with other guidance.
- 48% of total respondents (including those without a near-term target) had at least submitted a letter of commitment to SBTi.

Many companies that had not set a science-based target cited industry-specific concerns, such as a lack of guidance.

TCB Recommendation: Consider how to address the concerns of industries that do not currently have SBTi-specific guidance.

Reasons why companies have not set a near-term science-based or science-aligned target	Number	Percent
Count of If no target, why? - We are in the process of developing a target	30	64%
Count of If no target, why? - We are not yet able to accurately measure our Scope 1 & 2 emissions	7	15%
Count of If no target, why? - We do not think we'd be able to make meaningful progress on a near-term target	0	0%
Count of If no target, why? - Other (please specify)	16	34%
TOTAL	47	100%

Reasons why companies did not submit near-term target to SBTi	Number	Percent
Lack of resources to support the verification process	5	16%
Cost to set a target is too high	2	6%
SBTi's standards are too rigid	8	26%
SBTi does not allow carbon credits to count towards emission reductions for near-term targets	3	10%
We prefer a different standard	6	19%
Other (please specify)	15	48%
TOTAL	31	100%

Below is a combination of write-in reasons why companies have either not set a near-term target – or set one, but not submitted their target to SBTi by industry.

Industry	Interviewee Commentary
Financial Services	• "Bank industry focuses on NZBA" • "Concerns about a part of the standard being counterproductive."
Food, Beverage, Agriculture	• The new SBTi FLAG guidance is problematic and are weighing options
Fossil Fuels	• Don't have control over Scope 3 emissions • No SBTi guidelines for the sector • No SBTi guidelines for the sector (4 respondents)
Infrastructure	• *"SBTi is not accepting commitments from companies linked to the O&G industry"*
Manufacturing	• *"SBTi cement and lime sector target guidance were not available at the time our targets were established. Our targets are aligned to other sector targets, namely, Global Cement and Concrete Association (GCCA)"* • No SBTi guidelines for the sector
Materials	• No SBT guidelines for the chemical industry • No SBT guidelines for the chemical industry • Plan to submit within the next 4 months
Power Generation	• Depends on government policies (US based company) • We have set aspirations; but not specific targets for 2035; need additional technologies in utility sector
Real Estate	• *"SBTi is considering requiring Scope 2 emissions be calculated using the location-based method only"*
Services	• Completing measurement of Scope 1, 2, 3 emissions • "More than 50% of our turn-over coming from Oil & Gas."
Transportation Services	• "Fossil fuel revenues greater than the SBTi allowance" • "Waiting on finalisation of global Scope 3 survey" • "We are waiting on the final guidance for a 1.5 degree scenario and are also working to influence their position on carbon-negative SAF" • "We haven't included Scope 3 in our target yet" • "We submitted for validation but withdrew due to requirement to add downstream emissions for transported fuels"

KEY

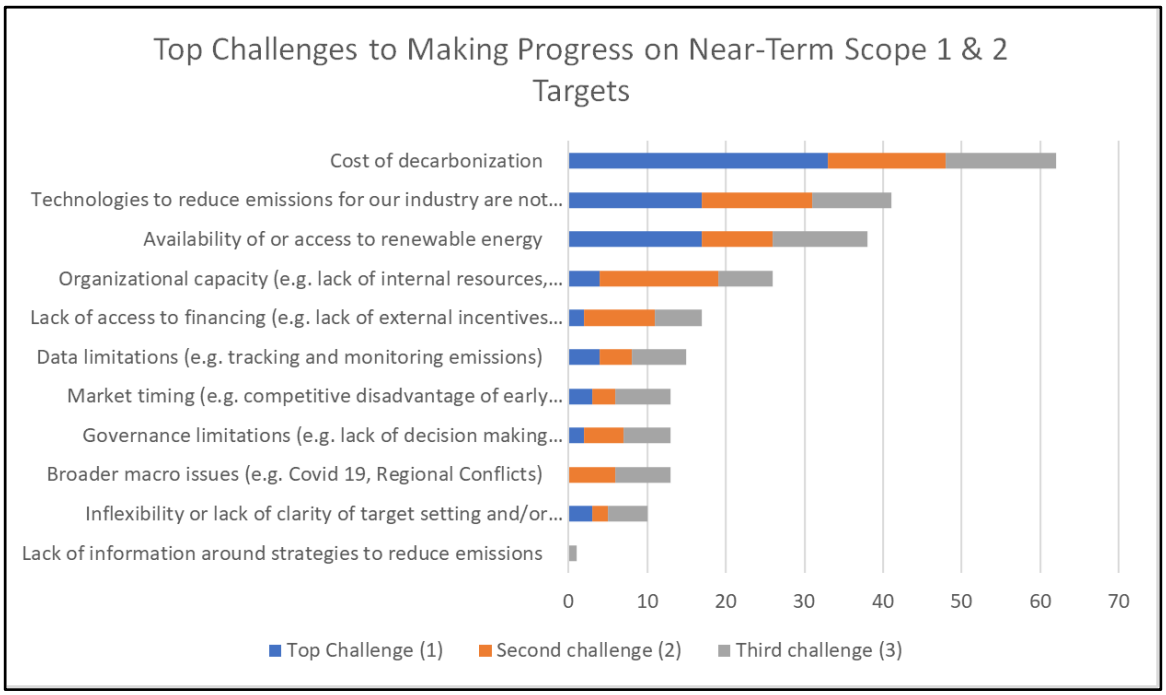
- Company has not set an SBT (and has no plans to within the next 2 years)
- Company plans to set a SBT within 2 years
- Company has an SBT, but has not submitted this target to SBTi

Most companies measure their near-term targets in absolute emissions.

- Scope 1 & 2
  - 81% are measured in absolute emissions
  - 18% use emission intensity
- Scope 3
  - 55% are measured in absolute emissions
  - 36% use emission intensity
  - 9% said other (3/5 companies that said "other" use supplier engagement metrics)

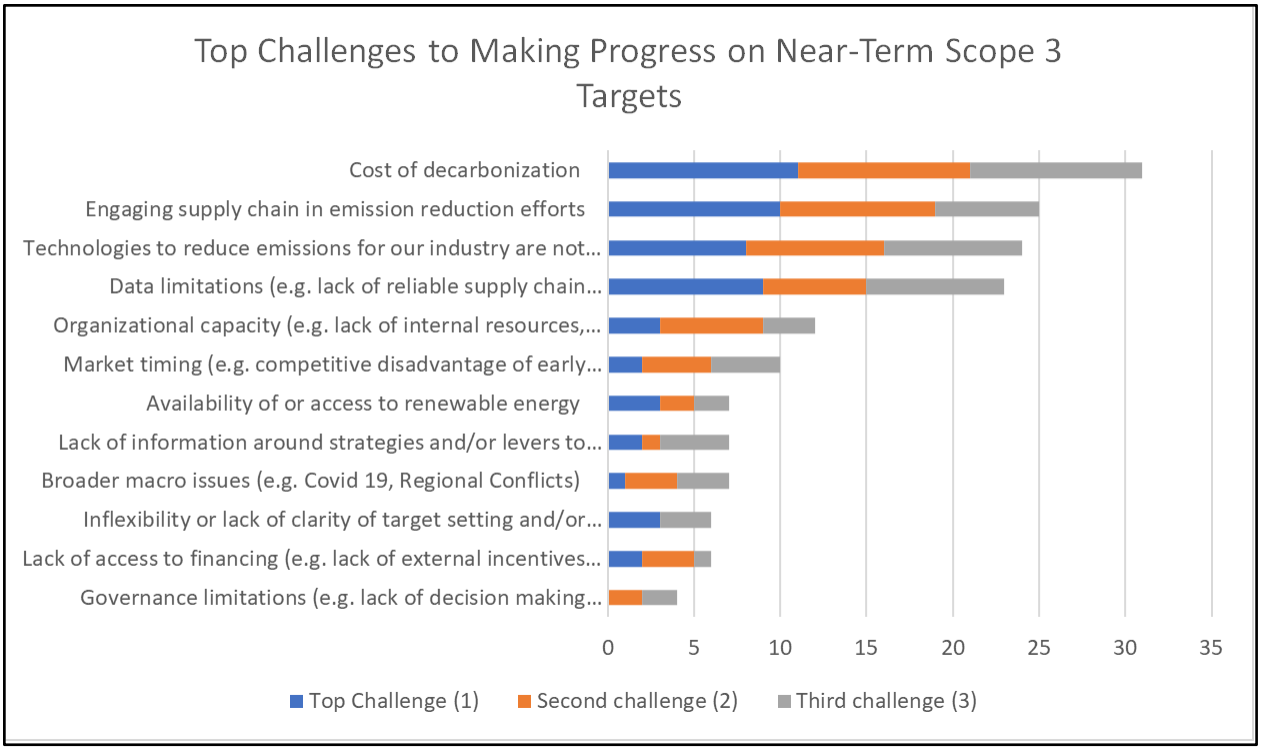
Scope 1 & 2 Insights

- **70% (62) of 87 companies that set a near-term SBT said they've faced critical challenges meeting this target.**
  - Of those 62 facing critical challenges, the majority (53) still say that they're making meaningful progress on these targets.
  - 30% said they've not faced any critical challenges to meeting the target



Scope 3 Insights

- Over half (60%) of respondents said that Scope 3 emissions make up greater than 75% of their company's total emissions. Notably, 9% said they were unsure what percent of their company's total emissions were Scope 3.
- **Only 40% (58) of survey respondents have set a near-term Scope 3 SBT.**
- **93% (54) of these respondents said they faced critical challenges meeting these targets.** Of the 54 respondents facing critical challenges, just over half (55%) say they are still making meaningful progress and 44% say they are struggling to do so.
- 7% (4) said they've not faced any critical challenges to meeting the target



55 (41%) of respondents purchased carbon credits in the past two years.

Primary Reasons for Purchasing Carbon Credits (n= 81) (Select one)	Number	Percent
To offset hard-to-abate operational (Scope 1 & 2) emissions	35	43%
To offset hard-to-abate Scope 3 emissions	13	16%
To provide funding and momentum for climate mitigation outside our company's value chain	12	15%
Pressure from external stakeholders (e.g. consumers or investors)	3	4%
Peer organizations have purchased carbon credits, setting a standard for us to follow	1	1%
Other (please specify)	18	22%
Total	**81**	**100%**

"Other" responses by industry:

Industry	Interviewee Commentary
Financial Services	• *"Carbon Neutral Event Certification"*

	• *"To finance climate & social projects equivalent to the size of our own emissions, we try to refer from using the term offset or compensation."*
Fossil Fuels	• *"Customer cargoes and to bring momentum to carbon credit market"* • *"In accordance with the carbon offsets allowance under South African Carbon Tax Act"* • *"In accordance with the carbon offsets allowance under South African Carbon Tax Act"*
Infrastructure	• *"to be carbon neutral on Scope 1&2 as we transition to zero"*
Manufacturing	• *"For compliance purposes, for product certification, to offset hard to abate operational Scope 1, 2, and 3 emissions."*
Materials	• *"Product lines that can gain eco-premium pricing."* • *"Regulators"* • *"Small volume as part of ETS compliance. Aside from that, no plans for carbon offsets for our interim targets given they are not allowed under SBTi rules."* • *"Still to be determined"*
Power Generation	• *"Dependent on government policies."*
Real Estate	• *"Cost of electrification has made it difficult to decarbonization steam buildings"*
Retail	• *"Product brand claims (not organizational emissions reduction targets)"* • *"We use our purchases as a paralleling strategy to our absolute emissions reduction initiatives."*
Services	• *"All of the above"* • *"Supporting environmental justice organizations and innovative projects"*
Transportation Services	• *"Purchased on behalf of our customers to offset their Scope 3"*

55 respondents (41%) have not purchased carbon credits and either have no plans to do so or are undecided when they will purchase.

The most common response (2/3 of respondents) was that companies did not intend to purchase until they've made progress/achieved their net zero commitments to "neutralize" residual emissions, which **suggests a strong alignment with SBTi.**

What has deterred purchase of carbon credits? (n=53) (Select all that apply)	Number	Percent
We do not intend to purchase carbon credits until we've made further progress on/achieved our net zero commitments so they can be used to neutralize residual emissions	36	68%
Concern over claims of greenwashing	30	57%
Lack of standardization and guidance around high-quality credits	27	51%
Carbon credits would not count toward our SBTi commitments	20	38%
No perceived competitive advantage to purchasing carbon credits	20	38%
Lack of financial resources or allocated funds to purchase carbon credits	14	26%
Other (please specify)	7	13%
Total	**53**	**100%**

"Other" responses by industry:

Industry	Interviewee Commentary
Food, Beverage & Agriculture	• *"We have our own forests, and we have insetting projects, and analyzing the option of carbon offsetting."* • *"We sequester/reduce more CO2 than we emit, as such we are seeking to register and sell credits or produce a verified carbon statement attesting to our CO2 net position."*
Materials	• *Resources for climate action are limited and we prioritize reduction, according to SBTi*
Services	• *"This a new space for us, we need more capacity support."*
Transportation Services	• *"Near term focus on avoidance and shift to lower carbon energy"* • *"Philosophy that carbon credits is the last resort to mitigate generated emissions - we have to eliminate or minimize them first and only then look at some compensating measures"*

Few respondents meet Steps 3 & 4 of the VCMI foundational criteria. 14% of respondents have SBTi validated near-term targets and are making progress on both Scope 1 & 2 and Scope 3 targets

- *Note: We reached out to ~5,000 participants and had only ~145 respondents. There is a possibility that organizations with a near-term climate target would be more likely to participate in the survey and companies that have yet to set a near-term target, less likely to participate.*

43% of companies surveyed did not know or were not comfortable providing estimates of cost the decarbonization.

- Only 57% of the 134 companies who answered questions relating to the carbon market provided information around the cost of decarbonization.
- Respondents from the Apparel, Fossil Fuel, Materials, and Real Estate sectors were most likely to provide estimates.

70% of respondents said that the use of carbon credits to meet a climate target under specific eligibility criteria to enable a certain degree of flexibility, would increase the likelihood that their company would setting/maintaining a science-based target.

- 30% said it would not
- 43% said yes, likely
- 27% said, yes, very likely

Respondents were asked to estimate the cost of reducing emissions for their organization. The following two charts depict the approximate unit cost of reducing Scope 1& 2 emissions:

Cost to decarbonize (Scope 1 & 2)	$0-20 $/tCO2	$20-50 $/tCO2	$50-100 $/tCO2	$100-200 $/tCO2	$200-500 $/tCO2	> $500 $/tCO2	Unknown	TOTAL Respondents
0-25% reduction from present day emissions	17	14	10	10	2	5	54	112
26 - 50% reduction from present day emissions	9	12	11	9	9	5	56	111

51 - 75% reduction from present day emissions	3	9	7	14	9	12	59	113
76 - 90% reduction from present day emissions	1	5	6	10	7	16	67	112

Cost to decarbonize (Scope 1 & 2) - Percent of those that specified a cost	**$0-20 $/tCO2**	**$20-50 $/tCO2**	**$50-100 $/tCO2**	**$100-200 $/tCO2**	**$200-500 $/tCO2**	**> $500 $/tCO2**
0-25% reduction from present day emissions	29%	24%	17%	17%	3%	9%
26 - 50% reduction from present day emissions	16%	22%	20%	16%	16%	9%
51 - 75% reduction from present day emissions	6%	17%	13%	26%	17%	22%
76 - 90% reduction from present day emissions	2%	11%	13%	22%	16%	36%

The following two charts depict the approximate unit cost of reducing Scope 3 emissions:

Cost to decarbonize (Scope 3)	**$0-20 $/tCO2**	**$20-50 $/tCO2**	**$50-100 $/tCO2**	**$100-200 $/tCO2**	**$200-500 $/tCO2**	**> $500 $/tCO2**	**Unknown**	**TOTAL Respondents**
0-25% reduction from present day emissions	5	8	10	6	8	4	69	110
26 - 50% reduction from present day emissions	1	6	5	12	6	5	74	109
51 - 75% reduction from present day emissions	0	2	5	6	9	7	79	108
76 - 90% reduction from present day emissions	0	2	1	8	6	10	84	111

Cost to decarbonize (Scope 3) - Percent of those that specified a cost	$0-20 $/tCO2	$20-50 $/tCO2	$50-100 $/tCO2	$100-200 $/tCO2	$200-500 $/tCO2	> $500 $/tCO2
0-25% reduction from present day emissions	12%	20%	24%	15%	20%	10%
26 - 50% reduction from present day emissions	3%	17%	14%	34%	17%	14%
51 - 75% reduction from present day emissions	0%	7%	17%	21%	31%	24%
76 - 90% reduction from present day emissions	0%	7%	4%	30%	22%	37%

Demographics Data

Region (headquartered)	Number	Percent
Asia	9	6%
Europe	52	36%
Latin America & the Caribbean	2	1%
Middle East & North Africa	2	1%
North America	67	46%
Oceania	5	3%
Sub-Saharan Africa	8	6%
Grand Total	145	100%

Region (majority of emissions)	Number	Percent
Asia	21	14%
Europe	32	22%
Latin America & the Caribbean	3	2%
Middle East & North Africa	1	1%
North America	63	43%
Oceania	4	3%
Sub-Saharan Africa	10	7%
Unsure	11	8%
Grand Total	145	100%

Percent of total emissions that are Scope 3	Column1	Column2
25 - 50%	11	8%
51 - 75%	23	16%
Greater than 75%	87	60%
Less than 25%	11	8%
Unsure	13	9%
Grand Total	145	100%

Industry	Number	Percent
Apparel	4	3%
Biotech, Health Care & Pharma	8	6%
Financial Services	15	10%
Food, Beverage & Agriculture	7	5%
Fossil Fuels	8	6%
Hospitality	4	3%
Infrastructure	5	3%
Manufacturing	11	8%
Materials	25	17%
Power Generation	7	5%
Real Estate	7	5%

Retail	9	6%
Services	17	12%
Transportation Services	18	12%
Grand Total	145	100%

Company size	Number	Percent
Large (annual revenue greater than $1B; likely over 2,000 employees)	108	74%
Medium (annual revenue between $30M - $1B; likely between 1,500 – 2,000 employees)	24	17%
Small (annual revenue between $10 - $30M; likely between 500 - 1,500 employees)	8	6%
Very Small (annual revenue less than $10M; likely less than 500 employees)	5	3%
Grand Total	145	100%

Public/Private	Number	Percent
Private	60	41%
Public	76	52%
Other (please specify)	9	6%
Grand Total	145	

Appendix C: Questionnaire (used for digital survey)

The Climate Board thanks you for taking the time to complete this survey (10-15 minutes). Your responses will directly inform the Voluntary Carbon Markets Integrity Initiative (VCMI)'s development of additional Claims Tiers for their Claims Code of Practice, a rulebook for the credible use of high-quality carbon credits. The aim of this survey is to better understand companies' primary challenges in making progress on their near-term climate commitments. If you have any questions, please reach out to research@theclimateboard.com.

* 1. In which region is your company headquartered?

* 2. In which region do most of your company's total emissions (Scope 1, 2, & 3) occur?

* 3. What percent of your company's total emissions are Scope 3?
- Less than 25%
- 25 - 50%
-51 - 75%
- Greater than 75%
- Unsure

* 4. Please select the industry that best describes your company.

* 5. Please specify the function in which your role sits:

* 6. Please specify your company's size:

* 7. Is your company public or private?
-Public
-Private
-Other (please specify)

8. Please provide the name of your company. This will remain anonymous. This is to avoid duplication of responses and will not be shared in any publication related to the survey. At the end of the survey you will also be given an option, if you are open, to share your email to participate in a follow-up interview.

* 9. Has your company set a near-term (by 2035 or earlier) science-based or science-aligned target?
-Yes
-No
-No, but we have committed to developing one within the next 1-2 years

* 10. What has prevented you from submitting a near-term target? (Select all that apply.)
-We are in the process of developing a target
-We are not yet able to accurately measure our Scope 1 & 2 emissions
-Other (please specify)

* 11. Have you submitted your target(s) to SBTi?
-Yes, and it has been validated
-Yes, but it has not yet been validated
-No, but we have submitted a commitment letter to SBTi
-No, but our target aligns with SBTi principles
-No, and our target aligns with other guidance

* 12. Why have you not submitted a target to SBTi? (check all that apply)
-Cost to set a target is too high
-Lack of resources to support the verification process SBTi's standards are too rigid
-SBTi does not allow carbon credits to count towards emission reductions for near-term targets
-We prefer a different standard
-Other (please specify)

* 13. Please specify how you set your science-based targets.

Scope 1 & 2 Near-Term Targets. Please respond to the following questions about your near-term science-based targets (SBTs) that address Scope 1 & 2 emissions.

* 14. Please specify if your near-term Scope 1 & 2 target(s) is/are measured in absolute emissions or emission intensity.
-Absolute emissions Emission intensity
-Other (please specify)

15. What indicators does your company use to demonstrate that you're making progress on these targets?
-Net GHG reduction %
-Renewable energy consumption %
-Carbon budget utilization rate
-% of supply chain emissions reduction
-% of SBT milestones achieved
-Other (please specify)

16. What is the frequency of your measurement of progress on this target?
-Quarterly
-Annually
-Every 2 years
-Every 5 years
-Other (please specify)

* 17. Have you had any critical challenges meeting your near-term Scope 1 & 2 science-based targets (SBTs)?
-No, we have not faced any critical challenges meeting this target
-Yes, but we are making meaningful progress
-Yes, and we are struggling to make meaningful progress

* 18. What are the TOP 3 challenges your company faces in meeting Scope 1 and 2 SBTs? (Please rank 3 options, with number 1 being your top challenge.)
-Technologies to reduce emissions for our industry are not available at scale
-Availability of or access to renewable energy
-Cost of decarbonization Lack of access to financing (e.g. lack of external incentives or funding)
-Organizational capacity (e.g. lack of internal resources, staff)
-Governance limitations (e.g. lack of decision-making structures, lack of KPIs tied to compensation)
-Data limitations (e.g. tracking and monitoring emissions data on an annual basis)
-Lack of information around strategies and/or levers to reduce Scope 1 and 2 emissions
-Inflexibility or lack of clarity of target-setting and/or disclosure frameworks
-Market timing (e.g. competitive disadvantage of early movers)
-Broader macro issues (e.g. Covid-19, Regional Conflicts)
-Other (please specify)

* 19. Has your company set a near-term Scope 3 SBT?
-Yes
-No

Near-Term Scope 3 Targets

Please respond to the following questions about your near-term SBTs that address Scope 3 emissions.

20. Please specify if your near-term Scope 3 target(s) is/are measured in absolute emissions or emission intensity.
-Absolute emissions
-Emission intensity
-Other (please specify)

21. What indicators does your company use to demonstrate that you're making progress on your Scope 3 SBT(s)?

-Net GHG reduction %
-Renewable energy consumption %
-Carbon budget utilization rate
-% of supply chain emissions reduction
-% of SBT milestones achieved
-Other (please specify)

22. What is the frequency of your measurement of progress on this target?
-Quarterly
-Annually
-Every 2 years
-Every 5 years
-Other (please specify)

* 23. Have you had any critical challenges meeting your near-term Scope 3 SBTs?
-No, we have not faced any critical challenges meeting this target
-Yes, but we are making meaningful progress
-Yes, and we are struggling to make meaningful progress

* 24. What are the TOP 3 challenges your company faces in meeting your Scope 3 SBT(s)? (Please rank 3 options, with number 1 being your top challenge.)
-Technologies to reduce emissions for our industry are not available at scale
-Availability of or access to renewable energy
-Cost of decarbonization
-Lack of access to financing (e.g. lack of external incentives or funding)
-Organizational capacity (e.g. lack of internal resources, staff)
-Governance limitations (e.g. lack of decision-making structures, lack of KPIs tied to compensation)
-Data limitations (e.g. lack of reliable supply chain emissions data)
-Lack of information around strategies and/or levers to reduce Scope 3 emissions
-Inflexibility or lack of clarity of target-setting and/or disclosure frameworks
-Market timing (e.g. competitive disadvantage of early movers)
-Broader macro issues (e.g. Covid-19, Regional Conflicts)
-Engaging supply chain in emission reduction efforts
-Other (please specify)

Please answer the following questions about the purchase of carbon credits.

* 25. Has your company purchased and/or does your company intend to purchase carbon credits? (select all that apply)
-We have purchased credits in the past 2 years
-We plan to purchase in the next 2 years
-We plan to purchase carbon credits by 2030
-We have not purchased and remain undecided when we will purchase
-We have not purchased carbon credits and have no plans to do so

* 26. What has deterred your company from purchasing carbon credits? (check all that apply)
-Concern over claims of greenwashing
-Lack of standardization and guidance around high-quality credits
-Carbon credits would not count toward our SBTi commitments
-We do not intend to purchase carbon credits until we've made further progress on/achieved our net zero commitments so they can be used to neutralize residual emissions
-Lack of financial resources or allocated funds to purchase carbon credits
-No perceived competitive advantage to purchasing carbon credits
-Other (please specify)

* 27. What is your company's primary reason for purchasing carbon credits?
-To offset hard-to-abate operational (Scope 1 & 2) emissions
-To offset hard-to-abate Scope 3 emissions

-To provide funding and momentum for climate mitigation outside our company's value chain
-Pressure from external stakeholders (e.g. consumers or investors)
-Peer organizations have purchased carbon credits, setting a standard for us to follow
-Other (please specify)

* 28. How did/will your company determine the quantity of credits to purchase?
-Apportioned to specific scopes (1,2,3)
-Using an internal carbon price
-Cost of carbon credits
-Availability of high-quality carbon credits
-Apportioned to remaining emissions after meeting near-term SBTs
-Apportioned to emissions from recent value chain expansion (Scopes 1, 2, 3)
-Other (please specify)

* 29. Would the use of carbon credits to meet a climate target under specific eligibility criteria to enable a certain degree of flexibility, increase the likelihood of your company setting/maintaining a science-based target?
-Yes, very likely
-Yes, likely
-No

Cost of Reducing Emissions

Please estimate the cost of reducing emissions for your organization.

30. Please select the approximate unit cost of reducing your **Scope 1 & 2** emissions.

	$0-20 ($/tCO2)	$20-50 ($/tCO2)	$50-100 ($/tCO2)	$100-200 ($/tCO2)	$200-500 ($/tCO2)	greater than $500 ($/tCO2)	Unknown
0-25% reduction from present day emissions	○	○	○	○	○	○	○
25-50% reduction from present day emissions	○	○	○	○	○	○	○
51-75% reduction from present day emissions	○	○	○	○	○	○	○
76-90% reduction from present day emissions	○	○	○	○	○	○	○

31. Please select the approximate unit cost of reducing your **Scope 3** emissions.

	$0-20 ($/tCO2)	$20-50 ($/tCO2)	$50-100 ($/tCO2)	$100-200 ($/tCO2)	$200-500 ($/tCO2)	greater than $500 ($/tCO2)	Unknown
0-25% reduction from present day emissions	○	○	○	○	○	○	○
25-50% reduction from present day emissions	○	○	○	○	○	○	○
51-75% reduction from present day emissions	○	○	○	○	○	○	○
76-90% reduction from present day emissions	○	○	○	○	○	○	○

32. Would you be willing to provide further input on the development of future VCMI Claims Tiers?
-Yes
-No

33. Please provide your email address (This will remain confidential and will not be shared outside of the research team.)

Endnotes: Sources for Literature Review

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