

# SCOPE 3 UPSTREAM: Big Challenges, Simple Remedies

June 2024



# Executive Summary



## 26x

Supply chain emissions are 26 times higher than operational emissions

**Supply chain Scope 3 emissions host 26 times the emissions that sit in Scopes 1 and 2.** Reported upstream emissions just from manufacturing, retail, and materials sectors have reported upstream emissions 1.4 times times the total CO<sub>2</sub> emitted in EU in 2022.

Despite this disproportionate scale, supply chain emissions continue to be overlooked. Corporates are twice as likely to measure operational (Scopes 1 and 2) emissions and 2.4 times more likely to set targets for those emissions compared to supply chain emissions (Scope 3). **Only 15% of corporates disclosing through CDP have set upstream Scope 3 targets.**

**The onus of action and accountability falls on two groups: corporates** (both management and the board of directors) and **investors**. Boards and management should drive this change internally, while investors should reinforce it through the capital market.

## Corporates – catalysing a step change in Scope 3 upstream

### Three factors to catalyse action:

#### I. Climate-responsible Board

Climate oversight by a board is central to fulfilling its fiduciary responsibilities. The accountability for climate-positive actions starts with the board and cascades through the organisation. Notably, corporates with a climate-responsible board<sup>a</sup> are 4.8 times more likely to set upstream Scope 3 targets. However, only 1 in 3 corporates disclosing through CDP have such a board. Hence, it is imperative to strengthen climate competence in boardrooms.

#### II. Supplier Engagement

Corporates that engage with suppliers are 6.6 times more likely to have a Scope 3 (upstream) target with a 1.5°C-aligned transition plan. Corporates that delay engagement face a steeper reduction trajectory and higher supply chain risks. Despite this, only 4 in 10 corporates engage with suppliers on climate issues, and just 1 in 10 collaborate with them. Corporates must ramp up supplier engagement and account for the risks in the supply chain.

a. With climate oversight and at least one climate-competent member



# \$335Bn+

Implied carbon liability for Scope 3 upstream emissions across manufacturing, materials, and retail sectors (assuming CDP reported emissions in 2023 priced at [IME](#)-proposed 2030 price of \$75)

### III. Adoption of Internal Carbon Pricing (ICP)

Setting an ICP drives climate-aligned decisions through financial metrics, ensuring climate cost transparency across an organisation. Corporates with an ICP integrated into business decisions are 4.1 times more likely to have a 1.5°C-aligned transition plan. However, only 14% of corporates reporting through CDP use ICP. Boards must hence mandate a fair internal price<sup>b</sup> for carbon to effectively drive low CO<sub>2</sub> decisions.

#### Investors – measuring climate risk

There is a dichotomy in how risk is priced by corporates and investors, leading to significant supply chain risks that can adversely impact business performance. Only 1 in 2 corporates evaluate the financial risks from upstream emissions, and a third of corporates that evaluate upstream Scope 3 financial risks acknowledge the risk to profit. **Disclosed upstream emissions from just the manufacturing, retail and materials sectors in 2023 alone imply a carbon liability of over \$335bn.**

Investors have a responsibility to appropriately price in risk from Scope 3, yet they are not adequately pricing in upstream risks. As part of investment policies, fewer than 1 in 10 require investees/clients to disclose Scope 3 upstream emissions. Therefore, investors must demand disclosure on upstream risks and price in climate risk as a surrogate force to drive transparency and action. In the absence of company-specific data, investors can leverage a “climate-adjusted” Capital Asset Pricing Model (CAPM) to embed risk into valuations.

#### Immediate priorities for Corporates and Investors

##### Board

- Nominate at least one climate competent board member and set up a board climate committee (leverage independent members or advisors)
- Articulate positive climate impact in the board’s Terms of Reference
- Mandate financial quantification of upstream Scope 3 risks and report to the Audit and Risk Committee

##### Management

- Launch holistic supplier engagement programs – measure and set upstream targets
- Pilot and embed internal carbon price in decision-making

##### Investors

- Embed climate risk in CAPM to ensure fair market valuations and drive emissions transparency and Scope 3 action

b. Anchored to global benchmarks (e.g., IMF’s International Carbon Price Floor, IPCC scenarios, etc.)

# Foreword



**Sherry Madera**  
Chief Executive Officer,  
CDP

*"Disclosing comprehensive Scope 3 emissions data is essential for corporates to access capital, drive business efficiencies, and comply with regulatory and market demands. Our data highlights that companies are twice as successful at measuring their Scope 1 and 2 emissions than their upstream Scope 3, despite the latter forming the bulk of their impact.*

*Scope 3 data is no longer a nice to have. Financial markets stakeholders, from corporates to investors, must scale up the level of accountability and action to match the scale of supply chain emissions. As global standards and incoming mandatory reporting rules require Scope 3, this disclosure will increasingly affect core business and portfolio success both at home and abroad.*

*Reporting and requesting climate data through CDP's new platform ensures that the same emissions data can be disclosed once, to be used many times by businesses, buyers and financial institutions across the globe."*



**Diana Dimitrova**  
Managing Director and Partner,  
BCG

*"Keeping warming to 1.5°C is at risk, and hence action is more urgent than ever. Corporates and investors, the key agents of our economies, need to lead.*

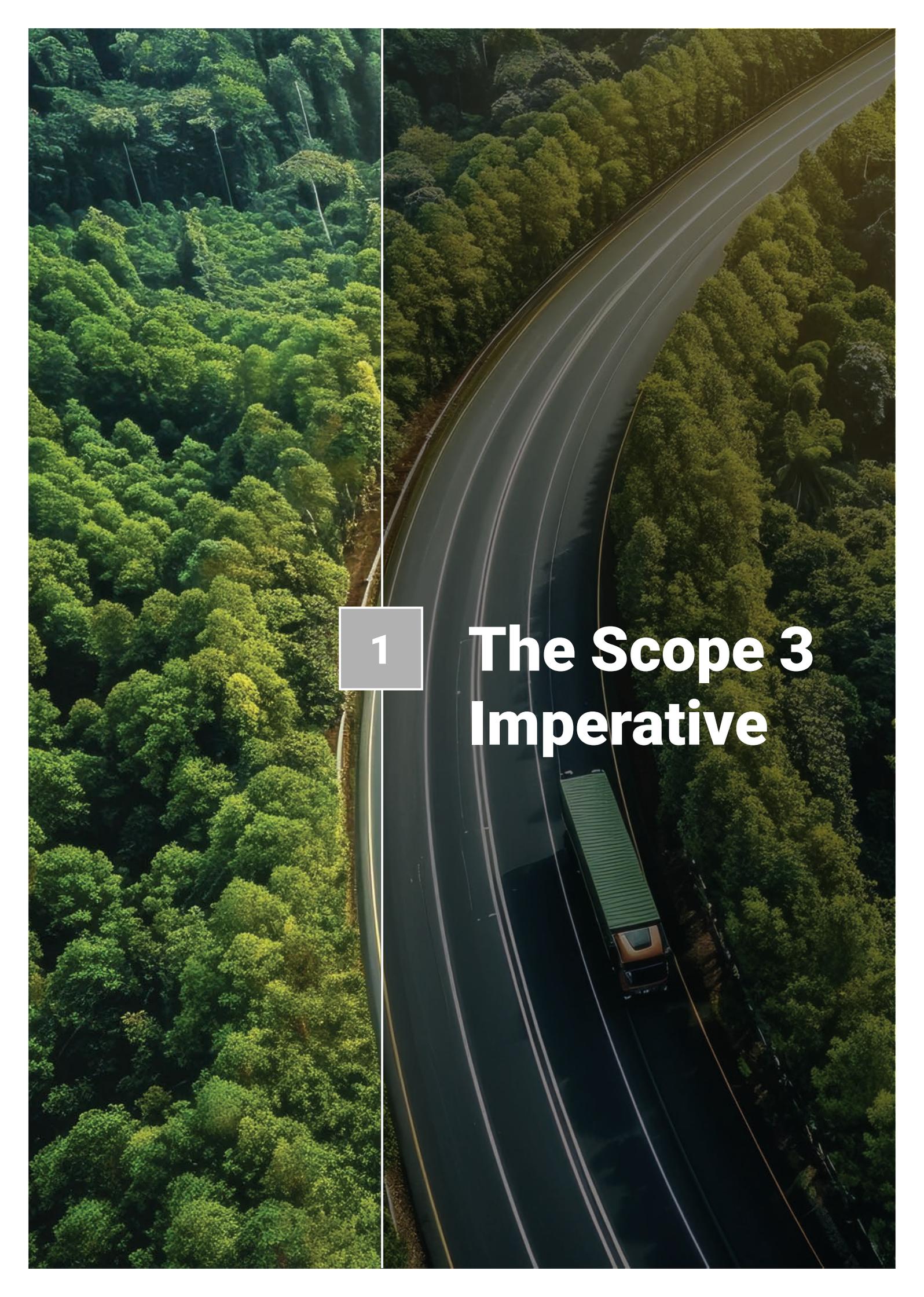
*Supply chain emissions are, on average, 26 times greater than a corporate's operational emissions. Hence, aligning climate ambitions across the supply chain helps drive a disproportionate impact on emissions. Yet, these emissions continue to be overlooked by corporates and investors alike. A \$335bn+ liability is overlooked. The responsibilities and incentives to act on Scope 3 emissions for these two groups converge on risk management, and their oversight bodies must push for emission reduction. Lack of management oversight on upstream emissions exposes boards to regulatory, reputation, and operational risks.*

*Boards have a fiduciary responsibility to act on climate-related risks, while investors must demand transparency and price in risk. Addressing Scope 3 emissions is therefore a shared responsibility.*

*The window to act is closing, and the challenge is significant, but the unlocks are simple. It is time to act swiftly and decisively. In this report, we outline clear, actionable steps to catalyse action for upstream emissions."*

# Contents

<b>0</b>	<b>Executive Summary</b>	<b>2</b>
<b>1</b>	<b>The Scope 3 Imperative</b>	<b>6</b>
	1A. Scope 3 : State of Play in 2023	7
	1B. Disproportionate Scale	8
	1C. Falling Short of the Mark	9
	1D. Role of Corporates and Investors in Scope 3	10
<b>2</b>	<b>Corporates - Catalysing a Step Change in Scope 3</b>	<b>11</b>
	2A. Three Factors That Matter in Managing Scope 3	12
	2B. Climate-Responsible Board	14
	2C. Supplier Engagement	17
	2D. Adoption of Internal Carbon Pricing	21
<b>3</b>	<b>Investors – Measuring Climate Risk</b>	<b>24</b>
	3A. Time to Price Climate Risk	25
	3B. Climate-Adjusted Capital Asset Pricing Model	26
<b>4</b>	<b>Immediate Priorities for Corporates and Investors</b>	<b>30</b>
<b>5</b>	<b>Acknowledgments</b>	<b>32</b>

An aerial photograph of a two-lane asphalt road curving through a dense, lush green forest. A large green truck is driving on the road. The image is split vertically, with the left side showing a more direct view of the forest and the right side showing the road's curve.

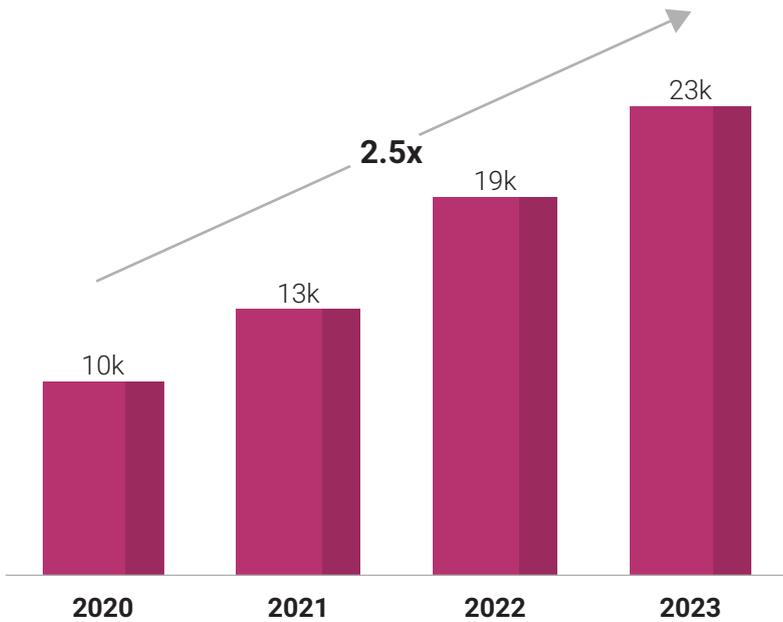
1

# The Scope 3 Imperative

# 1A. Scope 3 : State of Play in 2023

In 2023, disclosure numbers rose by 24% from the 19,000 corporates that disclosed through CDP in 2022, ~2.5x vs. 2020

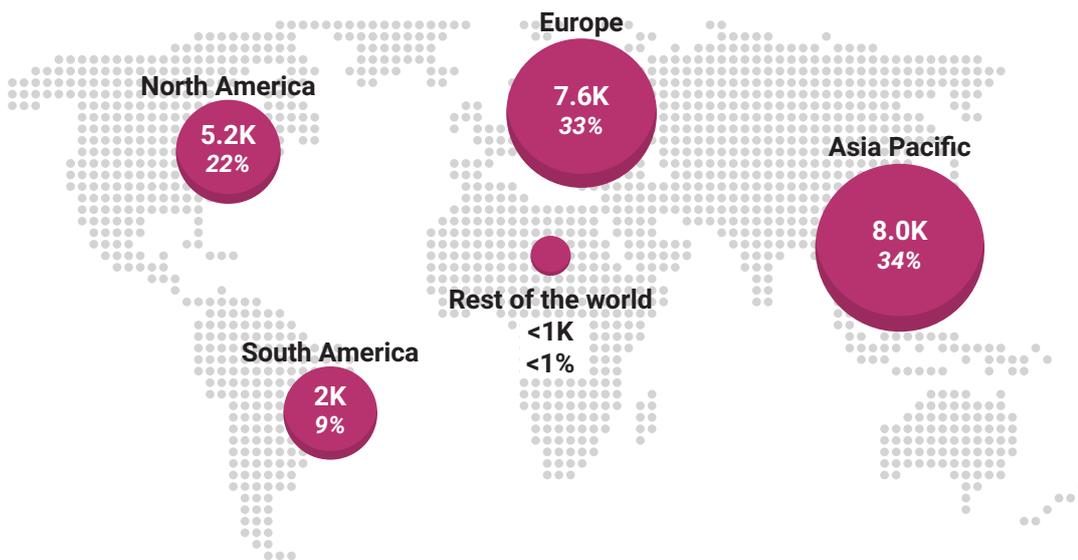
Number of disclosers: climate change



Coverage of indices: climate change



Distribution of disclosers



**37**

Global emissions in 2023 (Gt CO<sub>2</sub>e)

**~9**

Scope 3 supply chain footprint for select disclosers in 2023<sup>0</sup> (Gt CO<sub>2</sub>e)

Source: CDP 2023 Climate questionnaire 0. Based on 2023 corporate disclosures with responses filtered further for significantly sized corporates (absolute scope 3 upstream >1 million t CO<sub>2</sub>e, n = 957) with high quality disclosures (robust verification)



# 26x

Supply chain emissions are 26 times higher than operational emissions

## 1B. Disproportionate Scale

### Supply chain emissions are 26 times higher than operational emissions

In 2023, suppliers reported that their upstream Scope 3 emissions were, on average, **26 times greater than their emissions from direct operations (Scopes 1+2)**. (Exhibit 1)



# 1.4x

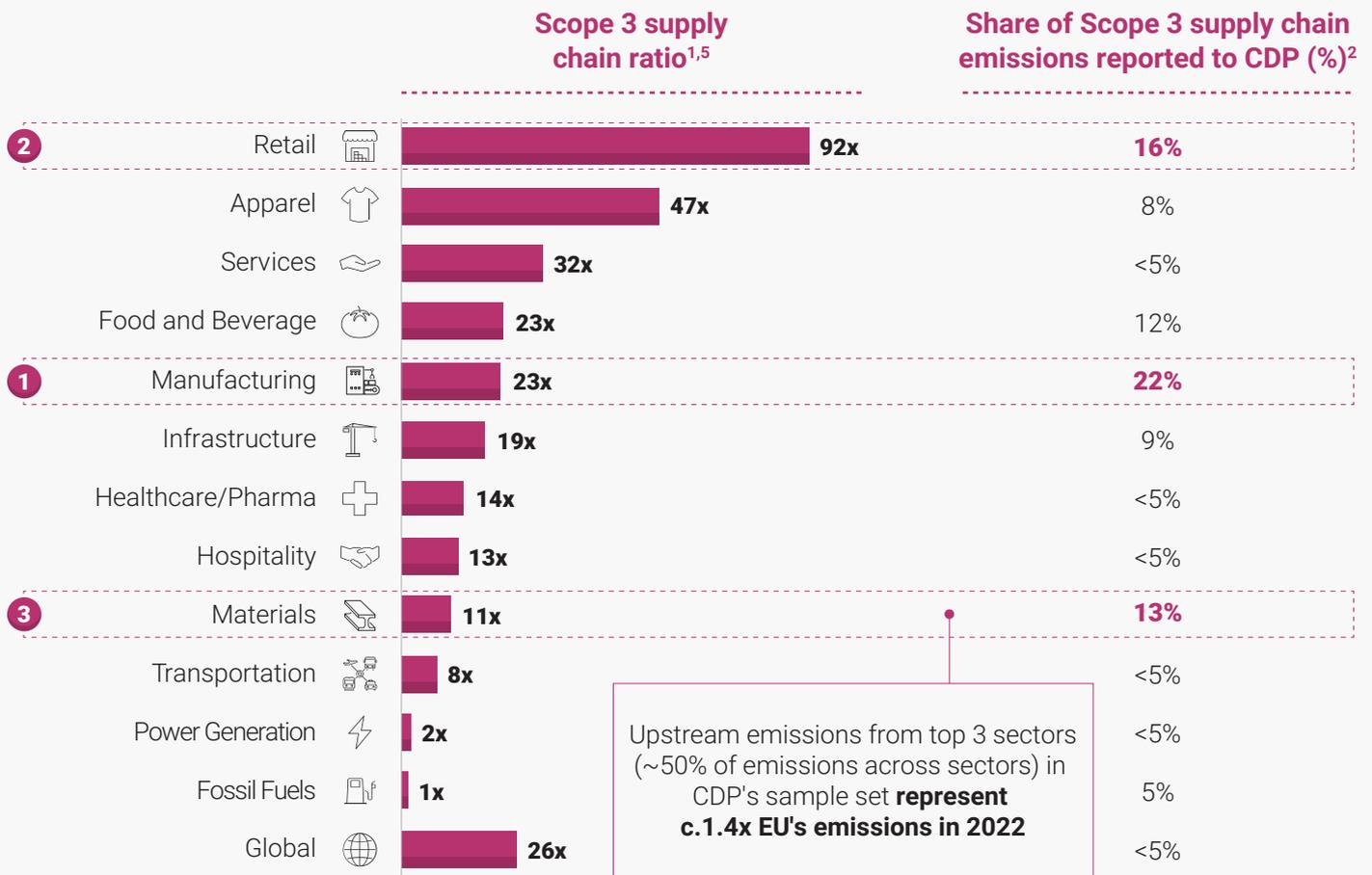
Upstream emissions from top 3 sectors in CDP's sample set represent c.1.4x EU's emissions in 2022

The number of corporates reporting through CDP has doubled since 2020. With increasing awareness, more suppliers are now accounting for emissions in line with the GHG protocol, shedding light on the true scale of supply chain emissions.

**Upstream emissions just from manufacturing<sup>3</sup>, retail, and materials sectors have a footprint that is 1.4 times the total CO<sub>2</sub>e emitted in EU in 2022<sup>4</sup>.**

However, despite the awareness of this disproportionate scale, progress on Scope 3 is still falling short.

**Exhibit 1 – Average ratio supply chain Scope 3 : Scopes 1+2 emissions and share of reported emissions**



**Source:** CDP 2023 disclosure data, filtered for corporates with sufficient verification of emissions disclosed evidenced in responses, n = 2,229 ; 1. Estimated as 11.4x in 2020 data 2. Responses filtered further for significantly sized corporates (absolute scope 3 upstream >1 million tCO<sub>2</sub>e, n = 957 including filtering for robust data verification) 3. Manufacturing includes all capital goods manufacturing, electronics, etc. 4. EU Emission data 5. Adjusting for underreported emissions using external data, Infrastructure emerges as fourth in the absolute rankings



# 1C. Falling Short of the Mark

## 2x

Compared to Scope 3, corporates are 2x more likely to measure Scopes 1 and 2 emissions and 2.4x more likely to set a target

### Progress on Scope 3 is significantly lagging behind

**Corporates are twice as likely to measure Scopes 1 and 2 emissions and 2.4 times more likely to set targets for Scopes 1 and 2 emissions compared with Scope 3 supply chain emissions.**

Despite overlaps, managing Scope 3 emissions is crucial for staying on track for 1.5°C – driving collaboration, innovation, and accountability across the value chain, and accelerating decarbonisation efforts.

**However, only 15% of corporates reporting through CDP have set a Scope 3 target** (Exhibit 2) – highlighting the cascading impact of the significant gaps in transparency and supplier engagement.

Exhibit 2 – Scope 3 emission management stock-take (% of Corporates)



Source: CDP 2023 disclosure data for 23K corporate disclosers. Note: Not all disclosers answer the same set of questions; minimum questionnaire was answered by ~11K and full questionnaire by ~12K, 6. Engagement with suppliers to collect information

“ The vast majority of our carbon emissions—77%—comes from our supply chain. We have been improving our view of these emissions by increasingly collecting product-level and real-world emissions data (through CDP), ensuring our disclosure reflects our climate impact. This helps guide our efforts to meet our target to reduce supply chain emissions by 42% by 2031. ”

BT Group

# 1D. Role of Corporates and Investors in Scope 3

## Onus of action and accountability

It takes corporates 12–18 months for partial Scope 3 disclosure and 1–3 years to deliver full Scope 3 disclosures, with up to 3–5 years to see meaningful reductions in Scope 3 upstream emissions (varies by sector, region, and supply chain footprint). Therefore, corporates just starting to report and engage with suppliers are at least 2–3 years away from setting Scope 3 targets and likely only realising reductions by 2028 – continuing to challenge the path to 1.5°C by 2030.

While forthcoming mandatory disclosure for emissions will continue to drive transparency, the pace of rollout for mandatory disclosures outside of Europe likely further delays action for upstream emissions.

**Therefore, the onus of action and accountability falls on two main groups: corporates (both management and the board of directors) and investors.**

Boards and management will drive internal change in line with their responsibilities, while investors will reinforce this through the capital market, upholding their capital stewardship. This will **catalyse the step change required to drive action on upstream Scope 3 emissions for the 90% of corporates without a target or transition plan.**

Exhibit 3 – Responsibilities of stakeholders and role in Scope 3 emissions management

	Stakeholder	Responsibility	Role in Scope 3	
Intrinsic	 Companies (Purchasers)	Emission responsibility	<ul style="list-style-type: none"> <li>• Supplier engagement</li> <li>• Target setting + delivery</li> </ul>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Primary focus of this report</b> </div>
	 Board of Directors	Fiduciary responsibility	<ul style="list-style-type: none"> <li>• Oversight</li> <li>• Steering</li> </ul>	
	 Investors	Capital stewardship	<ul style="list-style-type: none"> <li>• Fair valuation of risk-reward</li> <li>• Capital allocation</li> </ul>	
	 Regulators	Enforcement responsibility	<ul style="list-style-type: none"> <li>• Reporting regulations</li> <li>• Emission regulations</li> </ul>	
Extrinsic				



2

# Corporates – Catalysing a Step Change in Scope 3

# 2A. Three Factors That Matter in Managing Scope 3

## Three statistically significant factors

Out of over 20+ factors, three emerge as statistically significant to climate target setting and action<sup>7,8,11</sup>:

		<u>Target setting</u>	<u>Scope 3 action<sup>7</sup></u>
	<b>Climate-responsible board</b>	✓	✓
	<b>Supplier engagement<sup>8</sup></b>	✓	✓ <sup>9</sup>
	<b>Internal carbon price</b>	✓	✓
	<i>R-squared =</i>	0.65	0.52

More importantly, it is to be noted that the residual factors<sup>10</sup> are all a step in the right direction. The lack of statistical significance doesn't necessarily imply that the residual factors don't contribute to Scope 3 management. Rather, the three above emerge as the immediate priorities (Exhibit 4).

**For the 90% of corporates without a Scope 3 target or transition plan, focusing on the three most significant factors first is a more effective way to kick-start change.**

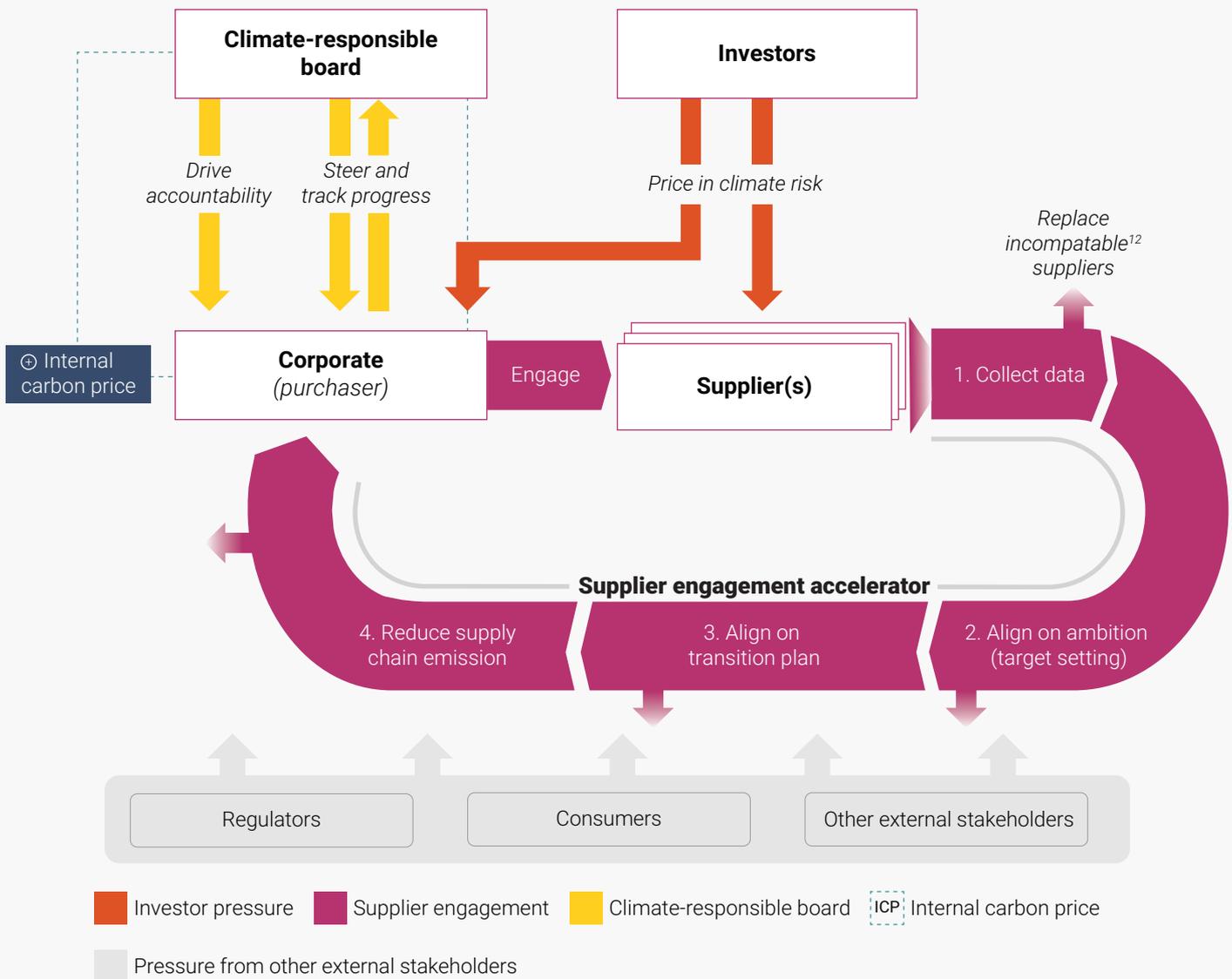
## Exhibit 4 – Drivers of target setting and action for Scope 3 upstream emissions

<u>Significant factors</u>	<u>Status quo today</u>	<u>Impact on climate action</u>
 <b>Climate-responsible board</b>	<b>34%</b> of corporates disclosing through CDP have a climate-responsible board <i>(oversight and at least one climate-competent board member)</i>	<b>4.8x</b> Corporates with climate-responsible boards are 4.8x more likely to have a <b>1.5°C-aligned transition plan with a Scope 3 target</b>
 <b>Supplier engagement</b>	<b>41%</b> of corporates are engaging with suppliers	<b>6.6x</b> Corporates that engage with suppliers on climate are 6.6x more likely to have a <b>1.5°C-aligned transition plan with a Scope 3 target</b>
 <b>Internal carbon price</b>	<b>14%</b> of corporates are using internal carbon price	<b>3.7x</b> Corporates using an internal carbon price are 3.7x more likely to have a <b>1.5°C-aligned transition plan with a Scope 3 target</b>

Source: CDP 2023 disclosure data

7. Climate action is outlined as having a Scope 3 target, a transition plan aligned with 1.5°C, and deeper integration with suppliers or climate incentivised Executives 8. Along with these 3 factors, measuring Scope 3 also emerges as a natural driver for target setting and action (measurement already being influenced by regulations and is an outcome of supplier engagement, board oversight and investor pressure) 9. Supplier engagement is a statistically significant driver for target setting but has been excluded from the correlation testing for action to avoid auto-correlation given that supplier engagement is included within Scope 3 action (i.e., the output variable) 10. Other factors not deemed to be statistically significant to catalyse action for Scope 3 upstream emissions (selected): management incentives, upstream risk assessment, climate-based contractual requirements for suppliers, etc. 11. Binomial probit model used for regression for both target setting and action

## Exhibit 5 – Scope 3 action flow



12. Replace suppliers that are not able to deliver on reduction targets

**These statistically significant factors interact together (Exhibit 5) as drivers of disproportionate performance for Scope 3 target setting and action.**

**The subsequent section does a deep-dive on the impact of each factor.**

## 2B. Climate-Responsible Board

### Effective governance drives change

The board plays a crucial role in ensuring checks and balances. Having a climate-responsible board emerges as a statistically significant driver in predicting the probability of Scope 3 emissions action. **Corporates with a climate-responsible board (oversight and competence) disproportionately set Scope 3 targets** (Exhibit 6).

Oversight (climate) on management actions by a board with climate competence is **fundamentally core to its fiduciary responsibilities to protect shareholder value** (Exhibit 7).

An engaged board mandates climate-aligned KPIs for management, incentivises the procurement team, and supports a CO<sub>2</sub>-aligned operating model.

Exhibit 6 – Impact of climate-responsible board on scope 3



Source: CDP 2023 disclosure data

Exhibit 7 – Boards and accountability cascade





# 34%

Of the corporates that disclosed through CDP, 74% have board oversight on climate but only 34% have a climate-responsible board (oversight and with at least one climate-competent member)



# 1/3

of board members feel knowledgeable enough to monitor and challenge climate plans (INSEAD and Heidrick & Struggles, 2021)

As custodian of shareholder value, the board is most exposed to downsides of management undermining Scope 3 emission risks. Therefore, lack of climate competence in a board weakens the core premise of corporate governance: checks and balances. Boards must recognise that climate risks, if left unaddressed, would eventually result in material impact on business performance. Along with management, boards must define a climate risk management framework that includes detailed scenarios and stress tests for emerging regulatory impacts and potential liabilities related to oversight of climate risks.

### Expectations are different from reality

In CDP's 2023 dataset, **74% of Boards have oversight on climate yet only 34% of corporates disclosing through CDP have both oversight and at least one climate competent board member.**

This gap is further underscored by BCG's 2023 survey. According to the survey, 3 in 4 board members say that climate change is "very" or "entirely" important to the strategic success of the corporates they oversee. However, **only one-third of boards prioritise sustainability and 1 in 6 have a dedicated sustainability committee** (INSEAD and Heidrick & Struggles, 2021).

Accountability for climate-positive actions starts with the board and cascades down an organisation. To initiate this cascade, it is imperative to focus on immediate unlocks for boards (Exhibit 8).

**“** Sustainability Oversight: Our Board of Directors (the Board) has established and approved the framework for our sustainability-related policies and procedures including environmental stewardship, energy and climate, fiber sourcing, waste and water management, product safety, charitable contributions, human rights, labor, and inclusion, equity, and diversity in employment. As part of their oversight roles, the Board and its Nominating and Corporate Governance Committee receive regular reports from management on these topics, our goals, and our progress toward achieving them.

Corporate Governance to Support Strategic Decision-Making: The Nominating and Corporate Governance Committee of the Board maintains a standing Sustainability Subcommittee to support the Committee in executing its oversight responsibilities for matters relating to sustainability, corporate social responsibilities, and corporate citizenship, as we continue to incorporate related risks and opportunities into the Board's overall strategic decision-making. **”**

Kimberly-Clark

## Exhibit 8 - Board room gaps and way forward



### Oversight



### Competence



### Transparency and reporting

#### Gap today

**49%**

of board members say climate change is “not” or “only slightly” integrated in investment decisions

**29%**

of board members feel knowledgeable enough to monitor and challenge climate plans

**46%**

of board members said their board has insufficient knowledge of the financial implications of climate change

**50%**

of board members are not satisfied with their board’s current reporting on progress in addressing climate change issues



#### Action

**1**

**Upskill** existing board members, **integrate climate competence** in board selection criteria (clear mandate to oversee compliance with emerging regulations and climate risk disclosures)

**2**

**Leverage independent board members/ external advisors** to set up board climate committee

**3**

**Actively provide oversight and steer climate risk assessment and mitigation – reflecting “climate-related liability” in board TORs<sup>13</sup>**

**4**

**Mandate reporting climate risk** (including quantified risk assessment) and **monitoring transition plans** to Audit and Risk Committee

Source: BCG, INSEAD, and Heidrick & Struggles surveys of corporate directors ([here](#), [here](#))  
13. Terms of reference

“ Risk Management to Facilitate Success of Long-Term Business Strategy: Our Board oversees risk management, including climate- and other environment-related risks and opportunities, and those related to social topics. The Board is focused on our long-term business strategy, including fostering sustainability-driven innovation, and incorporating our sustainability risks and opportunities into its overall strategic decision-making as appropriate. Sustainability risk areas for our company include shifting customer and consumer preferences toward sustainable products, increasing regulation and mandates related to single-use plastics and greenhouse gas emissions, supply chain risks related to water security and deforestation, and the cost of the commodities and natural resources required to make and market our products. ”

Kimberly-Clark



## 6.6x

Corporates that engage with suppliers are 6.6x more likely to have a climate transition plan aligned to 1.5°C with Scope 3 target (upstream)

## 2C. Supplier Engagement

### Supplier engagement is critical to Scope 3 action

Engaging suppliers is essential for managing Scope 3 upstream emissions, as doing so aligns climate ambitions across the entire supply chain.

Corporates can leverage their purchasing power to kick-start a feedback loop and cascade change across their supply chains.

**The first step to action is to create transparency on supplier emissions data.** This, in turn, supports corporates in setting targets and enables them to institute contractual obligations (for example, incentives) for suppliers in line with their transition plan (including targeted decarbonisation levers).

Engaging with suppliers drives a disproportionate impact on setting upstream Scope 3 targets. **Corporates that engage with suppliers are 6.6 times more likely to have a target and a transition plan that is aligned to 1.5°C.**

“ Our target is to halve Scope 3 greenhouse gas emissions by 2030 as we strive to create a healthier future for people, society and our planet. Upstream Scope 3 emissions represent 97% of our total carbon footprint so to achieve this ambitious target, in 2021 we started engaging directly with just 40 critical, high emitting suppliers to explain our expectations. This included: their transition to renewable energy, data reporting through CDP and adopting verified science-based targets with a pathway to limit warming to 1.5°C.

Since then, we have scaled up our engagement and today we're actively speaking to 745 of our suppliers accounting for over 50% of our spend. A key success factor in this acceleration was a global online event led by our CPO where we explained our targets and leveraged disclosure platforms like CDP and SBTi to help our suppliers publicly report, commit, and take action. ”

AstraZeneca



<3%

of corporates require suppliers to have set Science Based Targets



<9%

of corporates collaborate with suppliers for upstream emissions

### Corporates need to engage with suppliers early, but many are yet to cross the first hurdle

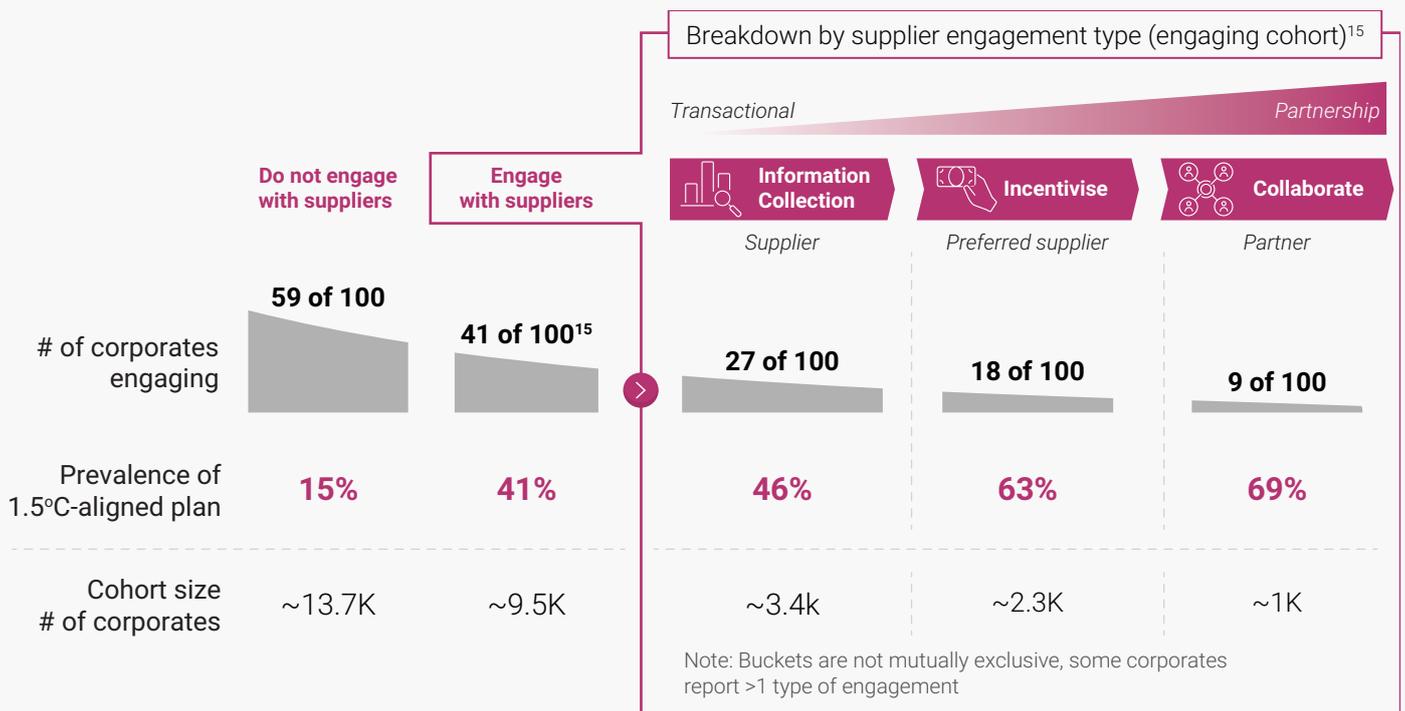
Nurturing supply chain partners requires time and effort. On average, it takes up to 1–3 years to fully disclose supply chain emissions<sup>14</sup> (today, only 25% of corporates are using supplier-specific methods to measure Scope 3.1) and up to 3–5 years before any reduction in emissions are realised.

**Therefore, corporates delaying engagement with their supply chains face a significantly steeper reduction trajectory, ultimately jeopardising the path to 1.5°C.**

Despite the clear case for engagement, corporates haven't improved supplier engagement over the past year and are yet to cross the first hurdle (Exhibit 9).

**Only 4 in 10 corporates engage with suppliers on climate-related issues.** Even fewer corporates, less than 1 in 10, collaborate closely with suppliers. And less than 3 in 100 corporates require suppliers to set science-based emissions reductions targets.

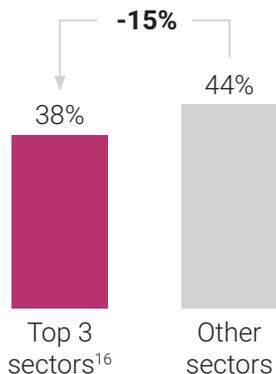
Exhibit 9 - Impact on climate action by supplier engagement type



Source: CDP 2023 disclosure data

14. Average number of years to report Scope 3.1 (Purchased goods & services) emissions using Hybrid / Supplier specific method CDP Data 15. Please note that there are overlaps in the buckets for engagement and they are not mutually exclusive; also, not all engaging with supplier disclose the breakdown of engagement)

### Rate of supplier engagement by sector (% of corporates)



Some sectors, driven by regulations, are ahead in collaborating with their supply chains and developing competitive advantages. For example, the EU’s regulation requiring 70% local lithium supplies by 2030 has led mining corporates to increase investments in EU-based refining capacity. Consequently, automakers are increasingly forging strategic alliances to secure the feedstock for batteries – creating competitive barriers for low-carbon lithium supplies.

**However, the supplier engagement rate for the top 3 sectors (in terms of absolute supply chain emissions footprint) is 15% lower than that of other sectors.**

**Therefore, boards must steer these sectors to set up supplier comprehensive engagement programs and account for climate risk in the corporates’ supply chains.**

### Supplier engagement = realistic target setting

Supplier engagement is crucial for setting realistic targets. Among the 2,191 corporates with upstream Scope 3 targets in both 2022 and 2023, **1 in 4 revised their targets** and scaled back on their upstream Scope 3 reduction ambitions (Exhibit 10).

Corporates that revised their targets had a more ambitious starting point. However, the challenge unfolds as target setters start engaging with their supply chain and enforcing contractual obligations.

In 2023, an uptick in the prevalence of corporates mandating supplier contractual obligations was observed in the cohort that revised their targets (in 2023, “revision” cohort has a 60% higher rate of mandating contractual obligations for suppliers).

### Exhibit 10 – Upstream Scope 3 target revision<sup>17</sup> trends



Source: CDP 2023 climate change questionnaire

16. Top 3 sectors: manufacturing, retail, and materials (refer page 8) 17. Revision (in 2023) is defined as lower coverage, lower reduction percentage, or later target year as compared to the upstream target parameters disclosed in 2022

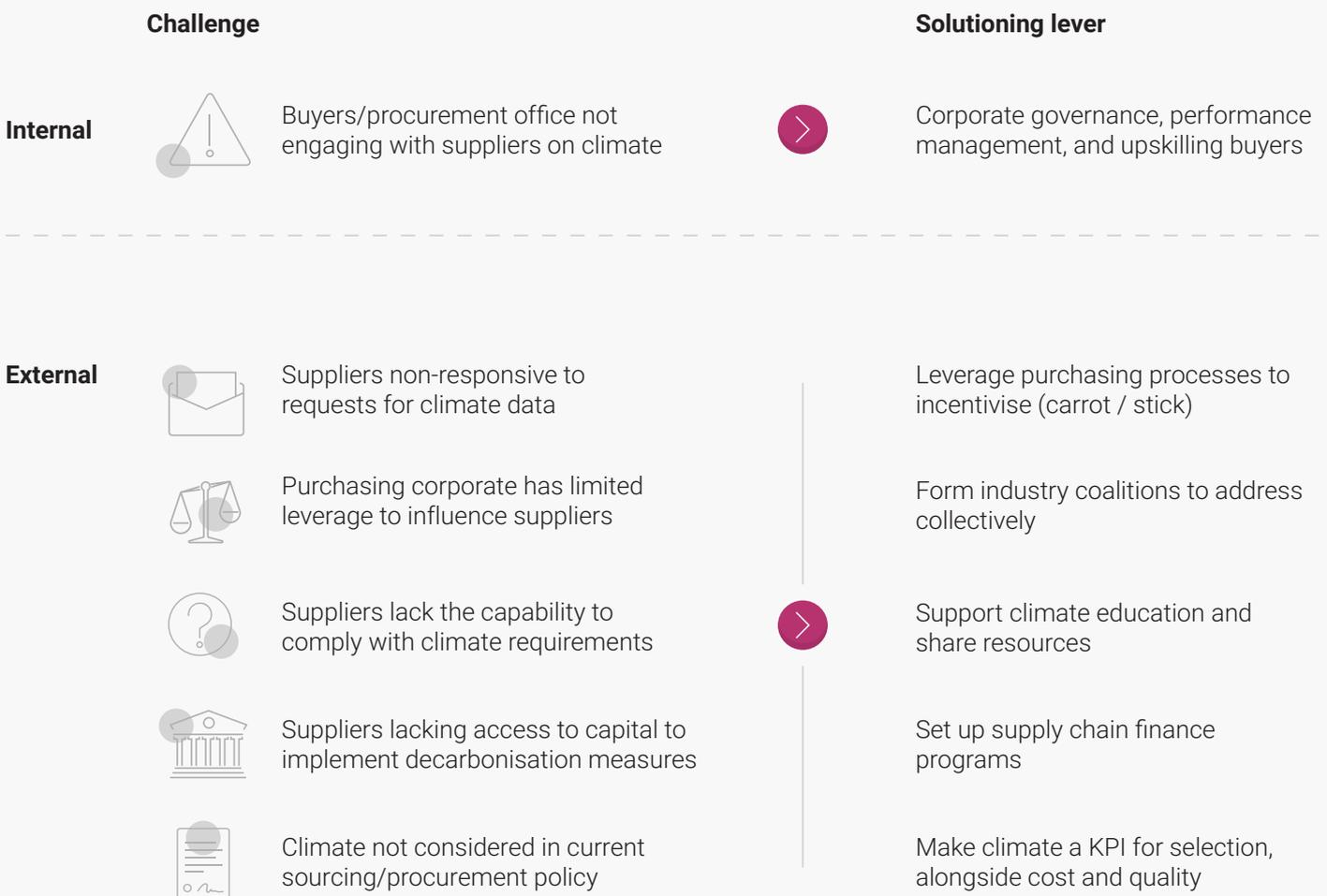
## De-bottlenecking supplier engagement

The top 3 sectors based on supply chain emissions disclosing through CDP (manufacturing, retail, and materials sectors; refer page 8) are 1.8 times less likely to contractually obligate climate-related information collection from suppliers. This is more pronounced for deeper upstream collaboration, as these sectors are yet to ramp up their efforts. Only 2% of corporates within the top 3 sectors collaborate<sup>18</sup> with their suppliers vs. 5% for other sectors (2.5x less likely), which further delays action on upstream emissions.

**In 2023, several external blockers remained** (Exhibit 11). For example, 63% of responders to SBTi's 2023 scope 3 survey cited inability to influence suppliers as a roadblock to setting a Scope 3 target, yet only 28% of corporates engage with suppliers.

Targeted solutions such as contracting incentives, climate education, and supply chain finance programs could help address these external blockers for supplier engagement.

### Exhibit 11— Archetypes of supplier engagement blockers



18. Collaboration is assumed to be "changing supplier behavior" and "innovation and collaboration" as per Question 12.1



# 14%

of corporates use internal carbon pricing (Based on 12K corporates responding through CDP's full questionnaire in 2023 – represents 1.7K corporates with internal carbon price as per C11.3)

## 2D. Adoption of Internal Carbon Pricing

### Considering the cost of carbon

Integrating internal carbon pricing (ICP) is crucial for aligning corporate strategies with true total cost, anticipating regulatory changes, and mitigating financial risks. **Setting an internal carbon price surfaces a corporate's material impact on the planet** – helping drive climate transparency across an organisation through financial metrics.

Corporates setting an internal carbon price and using carbon pricing in decision-making **demonstrate disproportionate performance in managing Scope 3 emissions.** (Exhibit 12)

Integrating carbon pricing in decision-making drives climate-positive resource allocation across CAPEX, OPEX, procurement, and R&D, allowing decision-makers to easily assess the trade-offs between financial returns and carbon emissions. This approach provides a comprehensive view of costs, including the cost of emissions.

### Pricing for Net-Zero

While corporates institutionalising an internal carbon price are better placed to progress on Scope 3 emissions, in 2023, only 14% of corporates used internal carbon pricing (prevalence is 3x in CDP's signatory requested cohort vs. supply chain cohort - 24% vs. 8%).

Exhibit 12 – Disproportionate impact of setting an internal carbon price



### 3.7x

Corporates with an internal carbon price are **3.7x more likely to have a Scope 3 Target and 1.5°C-aligned Scope 3 transition plan**



### 4.1x

Corporates with an internal carbon price that is **mandated for all business decisions** are 4.1x more likely to have a 1.5°C-aligned Scope 3 transition plan



### 3.5x

Corporates with an internal carbon price that is mandated for all business decisions are **3.5x more likely to have a climate requirements in supplier contracts**

Source: CDP climate change questionnaire 2023



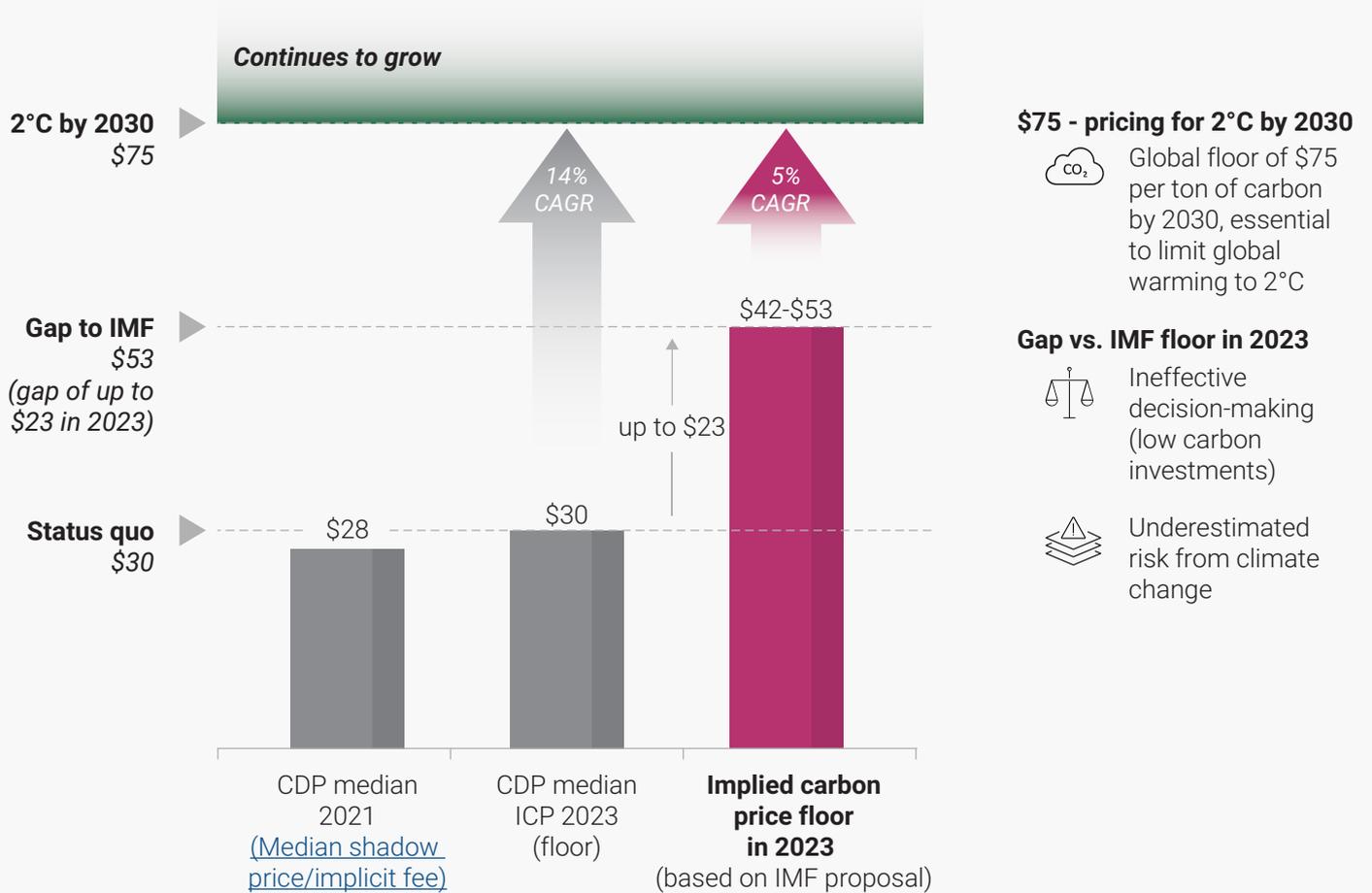
# \$335Bn+

Implied carbon liability for Scope 3 upstream emissions across manufacturing, materials, and retail sectors (assuming CDP reported emissions in 2023 priced at IMF-proposed 2030 price of \$75)

Furthermore, the median internal carbon price in 2023 was \$30. This is significantly below the estimated weighted average carbon price of \$53 based on IMF's floor price band (\$25-\$75 varying by economic development of a country). However, pricing carbon lower than the IMF's threshold is likely to result in ineffective decision-making and climate risk assessment.

IMF's 2021 study emphasizes the need for international cooperation to ensure fair and effective global pricing – highlighting a **global floor price of \$75 per ton of carbon by 2030 as essential to limit global warming to 2°C.**

### Exhibit 13 – Bridging the gap to IMF's carbon price window

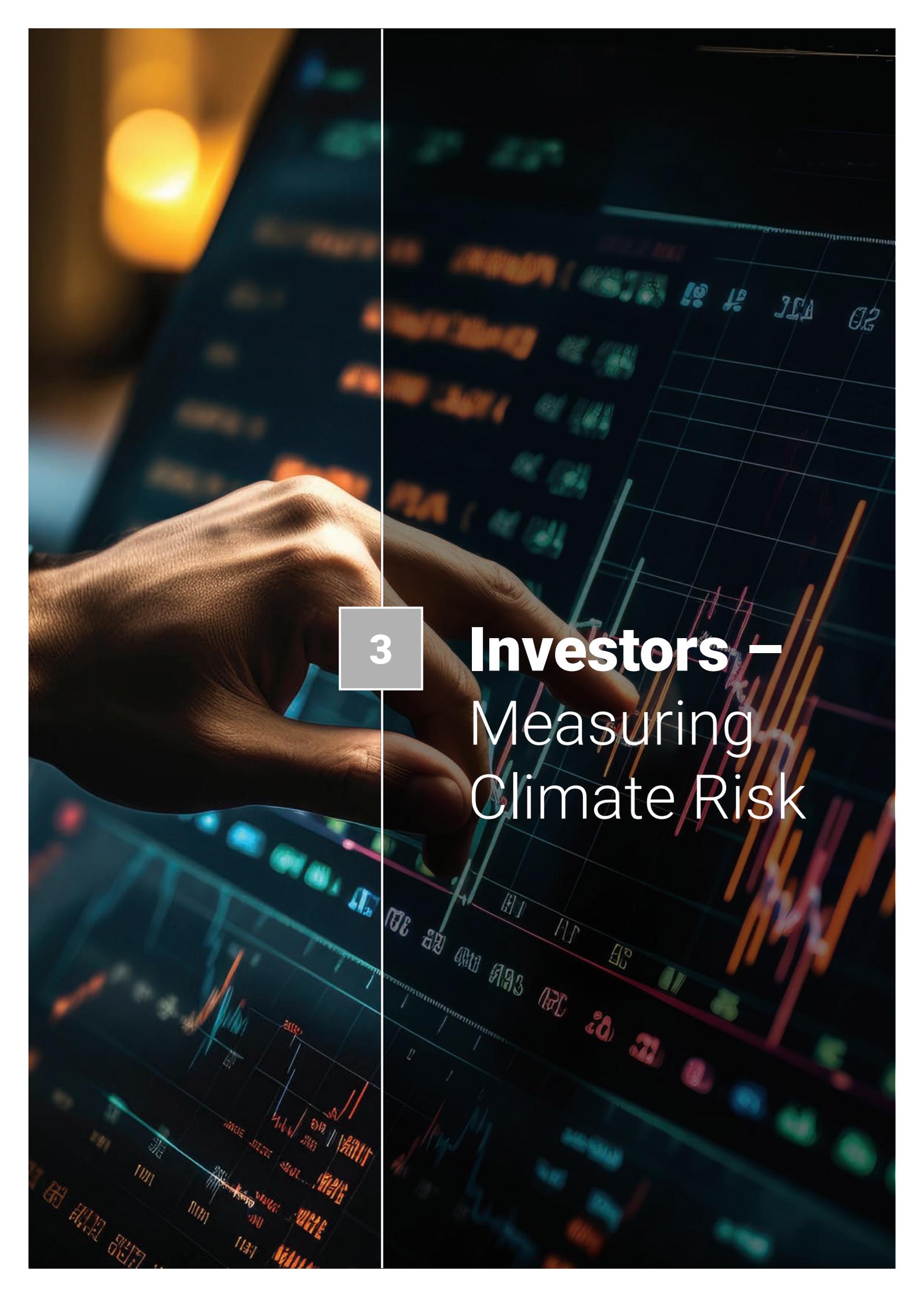


**Source:** CDP 2023 disclosure data on ICP (n=281) filtered for usage in Scope 3 and only for corporates reporting non-zero Scopes 1+2 emissions; outliers with prices >\$1000 have been excluded from the analysis. The underlying prices reflect IMF's floor recommendation of \$25/\$50/\$75 and have been extrapolated to similar geographies. To account for averages while extrapolating floor prices, a 20% buffer was assumed (bottom end); For \$335bn carbon liability, upstream emissions disclosed through CDP in 2023 was valued using IMF's reference price of \$75 with 1.5% discount rate for present value. (Conservative estimate as compared to other available estimates for example, IPCC's projection of \$100+ and Canadian government's projection of \$3,000)

Therefore, to effectively assess the impact of emissions and drive low CO<sub>2</sub> decisions, corporates must anchor their internal carbon price with external benchmarks (for example, IMF's International Carbon Price Floor, IPCC scenarios) and derisk the path to 2°C (Exhibit 13). **Boards must therefore mandate a fair internal price for carbon.**

“ Internal carbon pricing is not punitive, but rather a critical illuminating “green cursor” to pinpoint festering costs and risks associated with climate change that have been grossly underestimated by conventional economic measurement for decades. These accumulating unseen liabilities will sooner or later land on Boards, managers, insurers, suppliers, consumers and the general public. Internal carbon pricing is the best first defence against this looming mass of hidden deficit, and preparation for likely eventual integrated, mandatory, global carbon pricing regulation. ”

Paula DiPerna, CDP Special Advisor and  
former President, CCX International  
(pioneered worldwide climate change emissions trading)

A hand is pointing at a digital financial chart on a screen. The chart displays various data points and lines in shades of blue, green, and orange. The background is dark, and there is a warm, glowing light source in the upper left corner. The overall scene suggests a professional or financial setting.

3

# Investors – Measuring Climate Risk



# 3A. Time to Price Climate Risk

## 1 in 2

Only 50% of corporates disclosing through CDP evaluate the financial risks from upstream emissions

### Tip of the iceberg

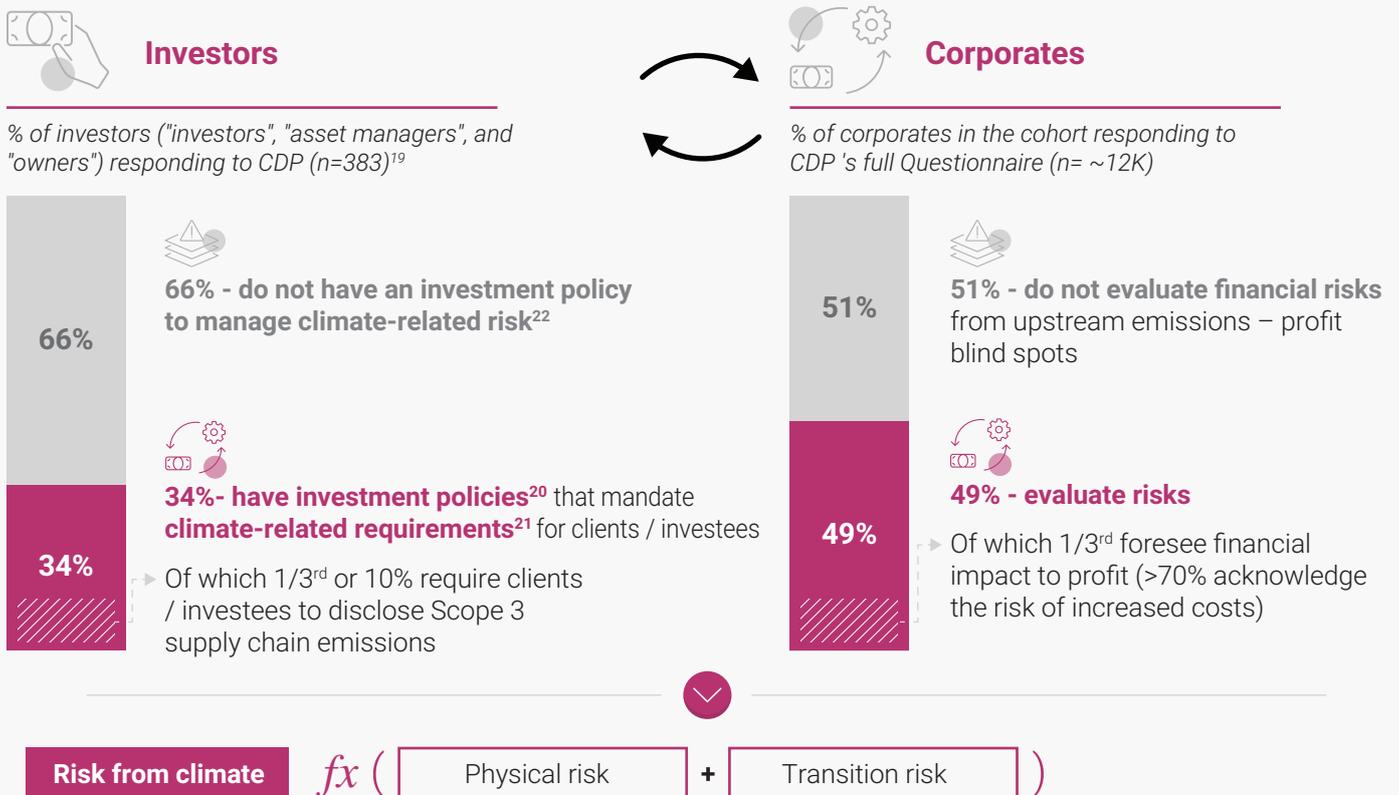
Emission blind spots from Scope 3 drive significant unreported risks for both investors, boards and management – material supply chain risk can adversely swing corporate performance.

#### Corporates:

**1 in 3 corporates that report on upstream Scope 3 financial risks acknowledge risks to profit** (70% of this cohort also acknowledging risk to costs) with >50% of the cohort anticipating these impacts in the short to medium term.

Yet, **only 1 in 2 corporates evaluate the financial risks from upstream emissions** (1 in 5 evaluate upstream risks and engage with suppliers to collect climate data), resulting in a significant gap in the ability to foresee, proactively manage, and mitigate risks from their supply chains (Exhibit 14). Corporates that have a **defined process** for identifying, assessing, and responding to climate-related risks are **four times more likely to foresee upstream climate-related risks** that could have a substantive impact on their business.

Exhibit 14 - Risk assesment gap



Source: CDP 2023 dataset

19. C-FS 3.6 used as the starting point, filtered for Investors and Asset Managers using C-FS0.7 20. policies which include climate-related requirements that clients/investees need to meet 21. Filtered for credit policy, risk policy, pricing policy, Investment policy/strategy, Sustainable/Responsible Investment Policy 22. Rationale for C-FS3.6a "To help manage climate related risks, organizations should integrate climate-related issues into existing policy frameworks." Physical risk includes acute and chronic risk; Transition risk includes policy & legal, technology, market, reputation risk



**67%**

of investors rank conflicts between ESG and financial performance or unclear financial benefits of ESG as top 2 challenges for considering ESG more strongly ([BCG investor pulse 2022](#))



**5%**

of investors rank climate as a top 3 risk driver, ranking 12th among macro considerations ([BCG Investor Pulse Q1 2024](#))

### Investors:

For investors, this ambiguity of risk compounds — **only 1 in 3 investors have climate risk in their investment policy (34%)**. However, as part of these policies, **less than 1 in 10 require investees/clients to disclose Scope 3**. This gap is also evidenced by a recent BCG investor survey in which **67% of investors ranked conflicts between ESG and financial performance or unclear financial benefits of ESG** as top 2 challenges for considering ESG more strongly. (BCG survey 2022)

Investors are not pricing in Scope 3 adequately, and hence are missing risks. These risks are already materialising. The frequency of \$1Bn+ natural catastrophes has grown threefold since the 1980s, insured losses from climate events have doubled vs. 2016, and the cost of reinsuring properties against extreme weather has grown +70% since 2016.

**Investors must demand disclosure on upstream risk and transparently reflect the risk in valuations.**

## 3B. Climate-Adjusted Capital Asset Pricing Model

**Investors have a responsibility to appropriately price in Scope 3 risk of portfolio companies and potential new investments**

Investors must demand transparency from investments on their Scope 3 so that an accurate and fair assessment of risk-reward can be determined, especially in regions where there is an absence of regulations.

**A simplified approach is proposed to introduce a climate risk premium in the capital asset pricing model** i.e., the foundation of valuation and risk-reward (Exhibit 15); in the absence of company-specific data, investors can attach a country climate risk based on the operational footprint of a company.

**Integrating climate in CAPM directly impacts a company's cost of equity** (high-level schematic methodology in Exhibit 17) and reinforces the accountability cascaded by the board, as the company is required to rethink its capital allocation to mitigate the higher Weighted Average Cost of Capital (WACC) through decarbonisation actions and risk adaptation measures, starting with reporting (Exhibit 16). Therefore, investors must price in climate risk as a surrogate force to drive transparency and action.

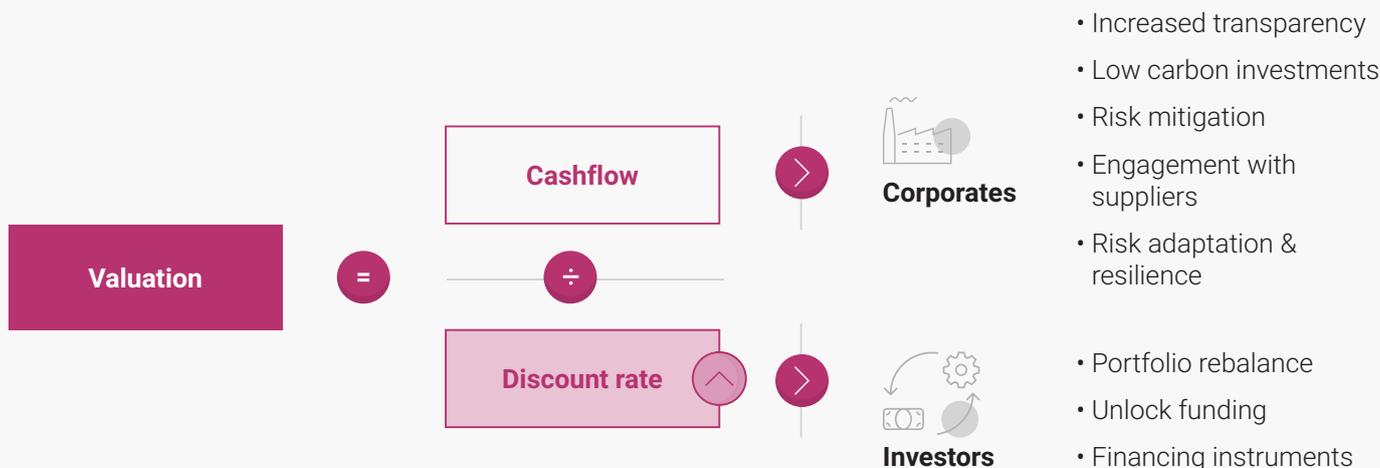
## Exhibit 15 – Climate adjusted Capital Asset Pricing Model



**Model asset level risk or entity level risk** (e.g., country level weighted avg. based on share of product in a country)

Leverage a **blend of leading indicators** (e.g., increasing insurance premiums) and **historical data points** (e.g., frequency of extreme weather events, # of days lost in production, etc.) to model risk

## Exhibit 16 – Second-order effects from higher cost of equity



**Note:** See below for standard terms for CAPM and see next page for a high-level schematic methodology for climate-adjusted CAPM

$K_e$	• Cost of equity for a company
Risk-free rate ( $R_f$ )	• Equivalent risk-free rate for the country of operation • Current 10-year US government bond yield (if unavailable)
Beta ( $\beta$ )	• Percent change in the price of an equity given a 1% change in an index • Based on analysis of comparable equity and market index
Expected market return	• Expected return from equities • Aligned with reference country to leverage the generally accepted U.S. market premium of 4%-6%

# Exhibit 17 - High-level schematic methodology for climate-adjusted Capital Asset Pricing Model (Indicative)

## Market Risk Premium

$$K_e = R_f + \beta \times (\text{Expected market return} - R_f) + \text{Climate risk}$$

Additional "climate-risk" variable to factor risk premium from increasing climate risk

### Step 1 Estimate country-specific "Climate Risk Index"

Country-specific "Climate Risk Index" evaluates the relative exposure of a corporate to country-specific risks (from in-country operations or supply chain and due to climate change, i.e., physical risks based on the corporate's supply chain or operational footprint) that impact profits (revenue and costs). It is assumed that regulatory and other transition risks (for simplicity) are already factored in by equity markets (e.g., margin impact from EU's proposed CBAM, etc.) "Climate Risk Index" is estimated as a weighted average of four components:

	Component	Calculation approach	
1 "Climate Risk Index" $\Sigma$	Weight	<b>Sovereign ESG index value</b>	ESG sovereign index of a country rated relative to a base country (e.g., using World Bank index) > Holistic ESG index of a country
	Weight	<b>Severe climate events</b>	Relative frequency and severity of extreme climate events based on country/regional weather data > Proxy of lost production days due to weather event
	Weight	<b>Insurance cost</b>	Country-/region-specific insurance coverage for production facilities, % change in reinsurance cost > Use a leading indicator proxy for climate change
	Weight	<b>Impact of climate on GDP</b>	Climate change scenarios for impact on GDP to account for macro conditions (e.g., NGFS Orderly) > Macro-risks from climate change. i.e., GDP

### Step 2 Estimate cost of equity premium for "Green" corporates

Premium applied to "Green" corporates is the difference in cost of equity attributed by the market to account for actions taken by the company to mitigate the impact of climate change – this is a proxy to bookend the range of adjustments to be applied to the cost of equity to add a premium that accounts for the additional risk. Country- and sector-specific "premiums" can be estimated by back-testing historical data (e.g., lower cost of equity for "green" corporates).

#### Calculation approach

2 "Green" premium	Spread in cost of capital based on ESG performance by sector and region (e.g., MSCI's est. for spread up to ~ 60 bps, WEF's est. of premium up to ~ 100 bps)	> Ceiling for shift in cost of equity (e.g. 60–100 bps)
-------------------	--	---

### Step 3 Aggregate corporate level Climate risk based on "Climate Risk Index" and ceiling for "Cost of Capital Premium"

Climate risk at the corporate level is calculated based on the weighted average exposure to a country (i.e., using the same approach as calculating the weighted average country risk premium for a corporate based on the proportion of revenue/cost in a particular country).

$$\text{Climate risk (impact on cost of equity)} = \text{Average of revenue exposure and cost exposure to a country} \left( \Sigma \text{ Share of revenue or cost by country} \right) \times \text{"Climate Risk Index"} \times \text{"Green" premium}$$

For a company at the onset of the change journey, **the path from measurement to realising reduction in Scope 3 emissions takes up to 5+ years, varying by sector and region.**

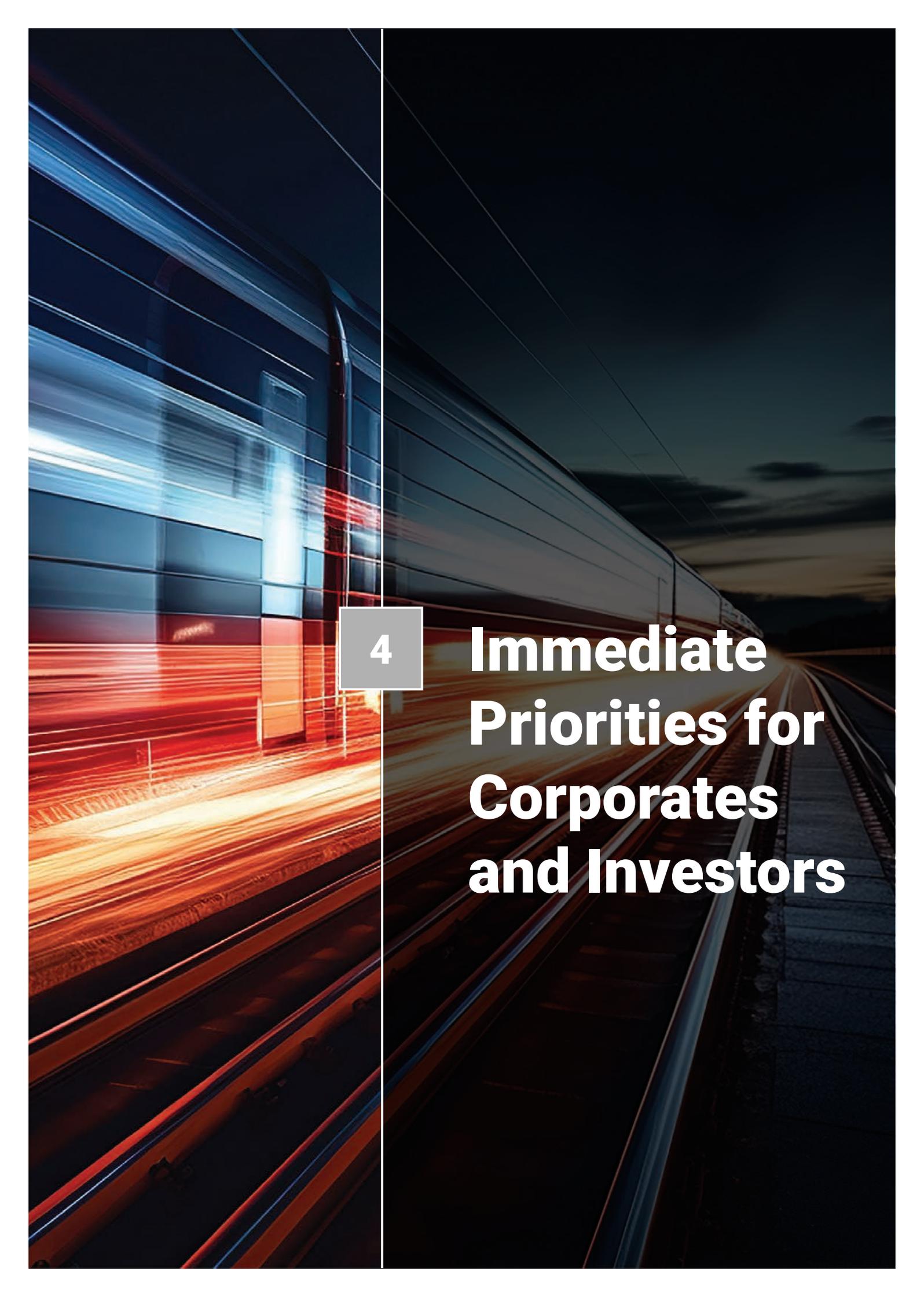
Investors and boards should therefore closely monitor this journey and utilise disclosures to **benchmark performance within sectors and across regions, especially focussing on the 3 statistically significant drivers.**

This helps investors better assess performance, price in transition risk, and adjust their portfolios toward corporates that effectively mitigate climate risks (including cross-border carbon regulations such as CBAM).

**Investors must demand transparency on Scope 3** so that an accurate and fair assessment of risk-reward can be determined. Doing so reinforces the actions driven by corporates (purchasers or supply chain authorities) to manage scope 3 upstream emissions and cascade down their supply chains across regions.

*“ Investors are not pricing in Scope 3 adequately. Investors must urgently act on this by demanding greater transparency from their portfolio on upstream Scope 3 emissions and the associated supply chain risks. Those that don't are exposing themselves to unknown financial risk, and the knock-on impacts for their downstream Scope 3 ambitions. ”*

Claire Elsdon Director,  
Capital Markets,  
CDP



4

# Immediate Priorities for Corporates and Investors

# Immediate Priorities for Corporates and Investors



## Boards

- Nominate at least one board member with climate competence
- Articulate climate impact (including climate related liability) consideration in board's Terms of Reference
- Leverage independent members or external advisors to set up board climate committee
- Upskill board on climate risks
- Mandate financial quantification of upstream Scope 3 risk and report it to Audit and Risk Committee



## Management

- Measure and set targets on Scope 3 emissions
- Launch holistic supplier engagement programs, starting with disclosure
- Pilot and embed internal carbon price (anchored by external benchmarks) in investment and decision-making processes



## Investors

- Drive emissions transparency and Scope 3 action
- Embed climate risk in CAPM to ensure fair market valuations

The image is a vertical composition. The background is a blurred aerial photograph of a lush green landscape, possibly a vineyard or agricultural field, with a network of roads or paths. Several bright red circular markers are scattered across the green terrain. In the foreground, a smartphone screen is visible, displaying a similar aerial view of the same landscape. The phone is held at an angle, and the screen's content is in sharp focus, showing the green fields, roads, and red markers. The overall lighting is soft and natural, suggesting an outdoor setting.

5

# Acknowledgments

**We are grateful to receive funding for CDP's Power of Procurement project from:**



# Acknowledgements

CDP would like to thank those who contributed to the preparation of this report. Firstly, BCG who supported in the production and insights of the report. Thanks also go to the contributions from the CDP Climate and Communications team, with special mention to Paula DiPerna, Special Advisor, CDP North America.

CDP would like to extend a special thanks to member companies who were interviewed for this report:

AstraZeneca

BT Group

Kimberly-Clark

**Sonya Bhonsle**

Director, Strategic Accounts  
CDP



**Sherry Madera**  
Chief Executive Officer  
CDP



**Dexter Galvin**  
Chief Commercial Officer  
CDP



**Sonya Bhonsle**  
Director, Strategic Accounts  
CDP



**Diana Dimitrova**  
Managing Director and Partner  
BCG



**Michel Frédeau**  
Senior Advisor  
BCG



**Subhajoti Ghosh**  
Project Leader  
BCG

## Contributors

**Paula DiPerna**  
Special Advisor, CDP  
North America

**Claire Elsdon**  
Director, Capital Markets,  
CDP

**Anshuman Bhonsle**  
Account Manager, Supply Chain  
and Reporter Services, CDP

**Andrew Savvides**  
Consultant, BCG

**Tara Soni Bhagat**  
Associate, BCG

**Belle van Zuilen**  
Associate, BCG



The data and analysis in this report were based on responses to the CDP 2023 information request. No representation or warranty (express or implied) is given by the contributors as to the accuracy or completeness of the information and opinions contained in this report. One should not act upon the information contained in this publication without obtaining specific professional advice. To the extent permitted by law, the contributors do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this report or for any decision based on it. All information and views expressed herein by the contributors are based on their judgment at the time of this report and are subject to change without notice due to economic, political, industry and firm-specific factors. Guest commentaries included in this report reflect the views of their respective authors; their inclusion is not an endorsement of them.

### CDP

CDP is a global non-profit that runs the world's environmental disclosure system for companies, cities, states and regions. Founded in 2000 and working with more than 700 financial institutions with over \$142 trillion in assets, CDP pioneered using capital markets and corporate procurement to motivate companies to disclose their environmental impacts, and to reduce greenhouse gas emissions, safeguard water resources and protect forests. Over 24,000 organizations around the world disclosed data through CDP in 2023, with more than 23,000 companies – including listed companies worth two thirds global market capitalization - and over 1,100 cities, states and regions. Fully TCFD aligned, CDP holds the largest environmental database in the world, and CDP scores are widely used to drive investment and procurement decisions towards a zero carbon, sustainable and resilient economy. CDP is a founding member of the Science Based Targets initiative, We Mean Business Coalition, The Investor Agenda and the Net Zero Asset Managers initiative. Visit [cdp.net](https://cdp.net) or follow us @CDP to find out more. © 2024 CDP. All rights reserved.

### Boston Consulting Group

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders-empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact. To find the latest BCG content and register to receive e-alerts on this topic or others, please visit [bcg.com](https://bcg.com). Follow Boston Consulting Group on Facebook and Twitter. © Boston Consulting Group 2024. All rights reserved.

