



Valuing carbon pre-investment

Private Equity Sustainable Markets Initiative (PESMIT)

September, 2024



Sustainable
Markets
Initiative



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Sustainable
Markets
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Valuing carbon pre-investment - PESMIT

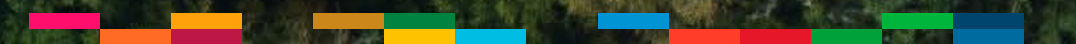


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Context



Introduction

The Sustainable Markets Initiative (SMI) was launched in 2020 at the World Economic Forum Annual Meeting in Davos by His Majesty King Charles III when he was The Prince of Wales.

The SMI is a network of global CEOs across industries working together to build prosperous and sustainable economies that generate long-term value through the balanced integration of natural, social, human, and financial capital. These global CEOs see themselves as a ‘Coalition of the Willing’ helping to lead their industries onto a more ambitious, accelerated, and sustainable trajectory.

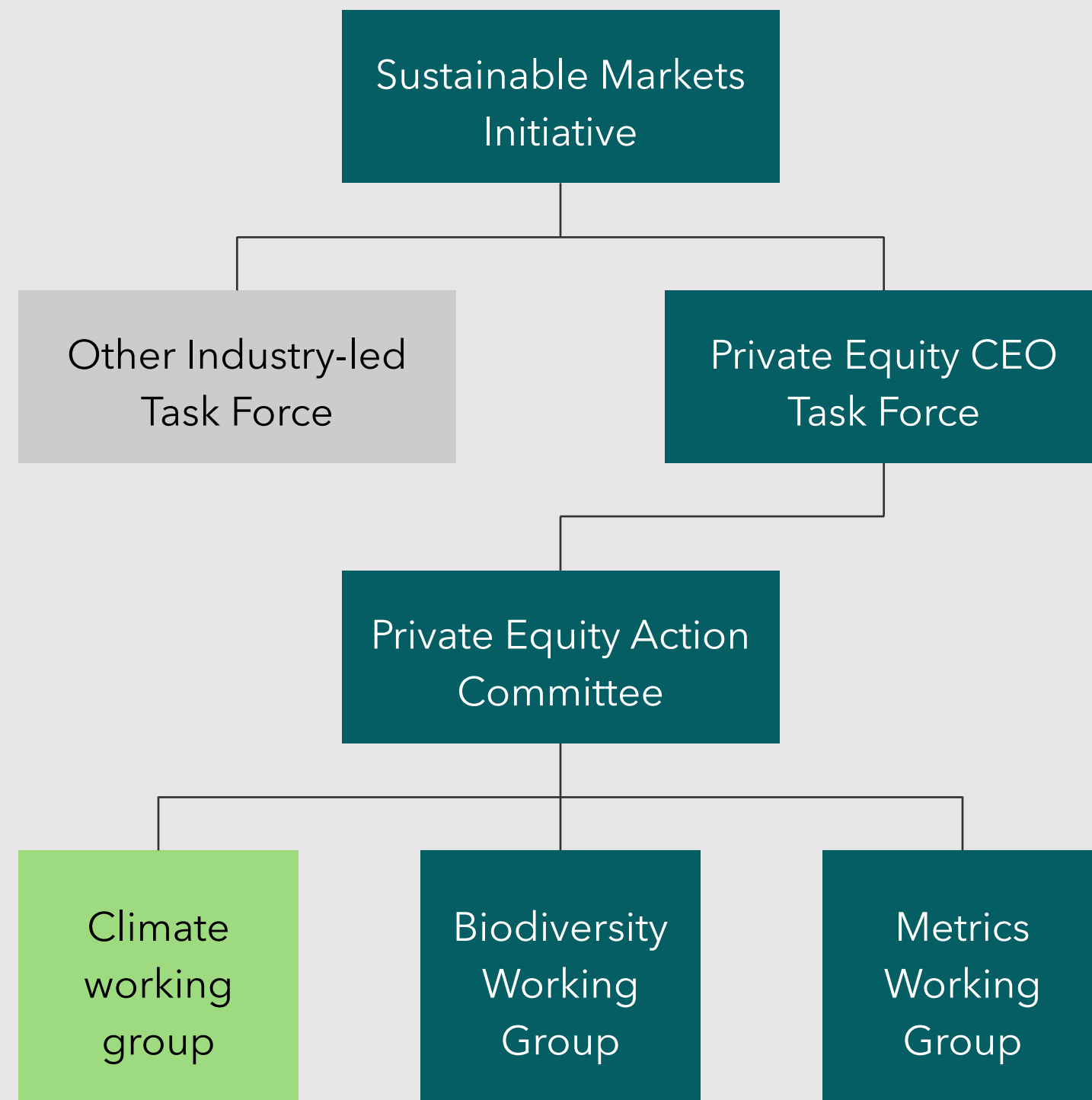
The SMI seeks to put Nature, People and Planet at the heart of global value creation. This is evident through its Terra Carta, which serves as the mandate for the SMI and provides a practical roadmap for acceleration towards an ambitious and sustainable future; one that will harness the power of Nature combined with the transformative power, innovation, and resources of the private sector.

The Private Equity Task Force was launched in 2021 and is the first ever CEO-level private equity working group established to discuss ways the industry can effect change. The Task Force leverages expertise within each member firm across three priority areas: climate change, biodiversity and sustainability-related metrics.

This paper includes input from the climate change working group, a subgroup of the SMI’s Private Equity Task Force (PESMIT).¹ Leveraging the [2023 Valuing Carbon in Private Markets](#) publication, the PESMIT Climate Working Group and ERM have developed supplemental **practical guidance on valuation of carbon in the context of pre-investment.**

The purpose of this follow-on paper therefore is to offer further guidance on how to implement the framework, rather than a prescriptive model. In so doing, we believe that by valuing carbon in the pre-investment process, investors will be better equipped to make investment decisions based on quantifiable metrics. Throughout this document, “carbon” is used as an umbrella term encompassing all greenhouse gases and their carbon emission equivalents.

For more details on the SMI and PESMIT, please visit the [website](#).



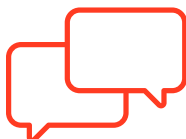
1) As discussed further in the Legal Disclaimer, participation in the Sustainable Markets Initiative, including the Task Forces and/or Working Groups, is not intended to convey current or anticipated alignment with or endorsement or approval of the information contained in this paper. Rather, this paper aggregates information and examples gathered from multiple sources; individual firms’ approaches may vary significantly.



Objectives of this initiative

Leveraging the [2023 Valuing Carbon in Private Markets](#) publication, the PESMIT Climate Working Group and ERM have developed supplemental practical guidance on valuation of carbon in the pre-investment context as a means of assessing material risks and value creation opportunities.

Guidance will:



- Build on positive feedback received on previous publication



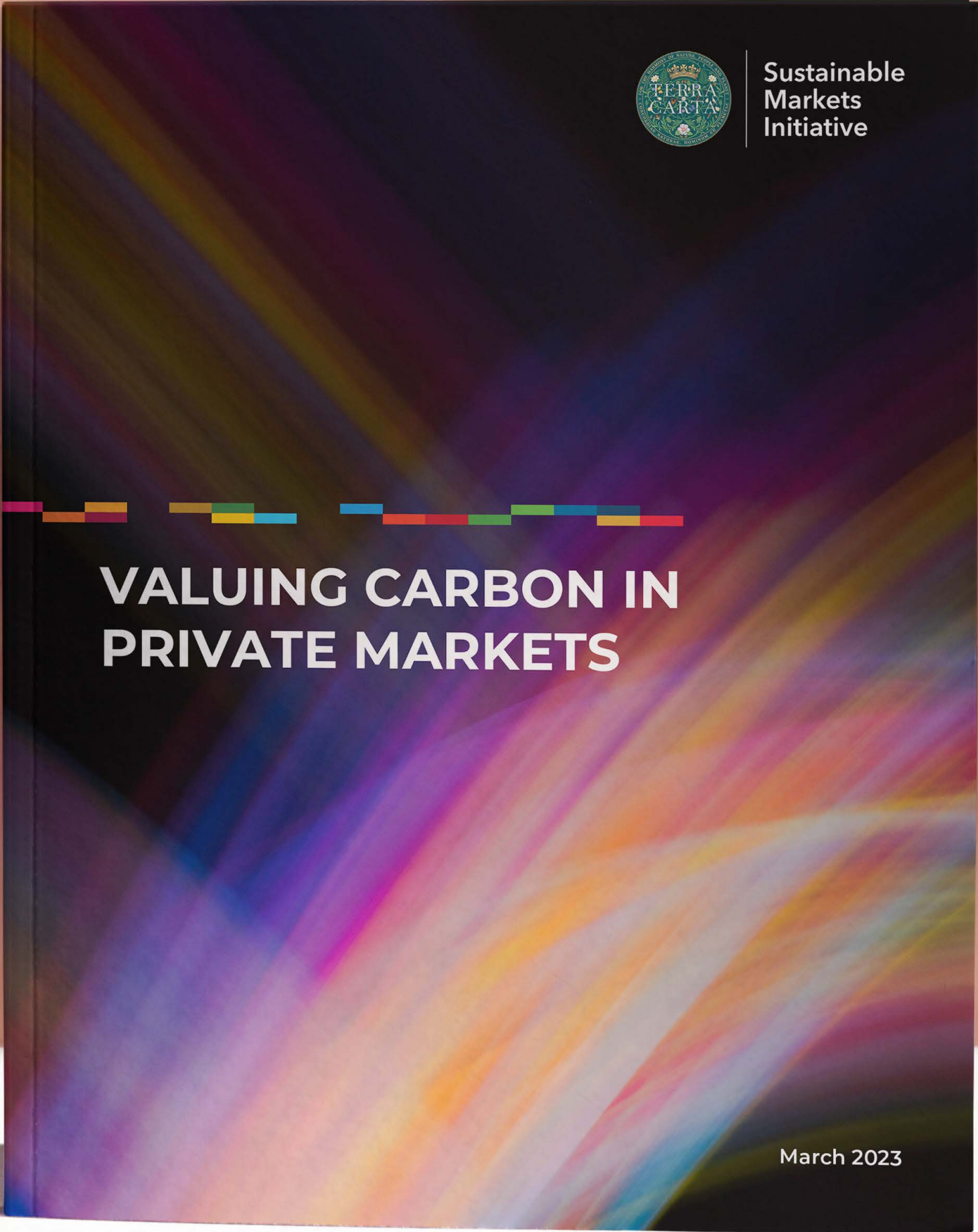
- Consider ways to value carbon in private markets early in the investment lifecycle (i.e. in Due Diligence [DD])



- Include tangible, quantified examples



- Emphasize the business case for integrating carbon considerations into value-creation planning



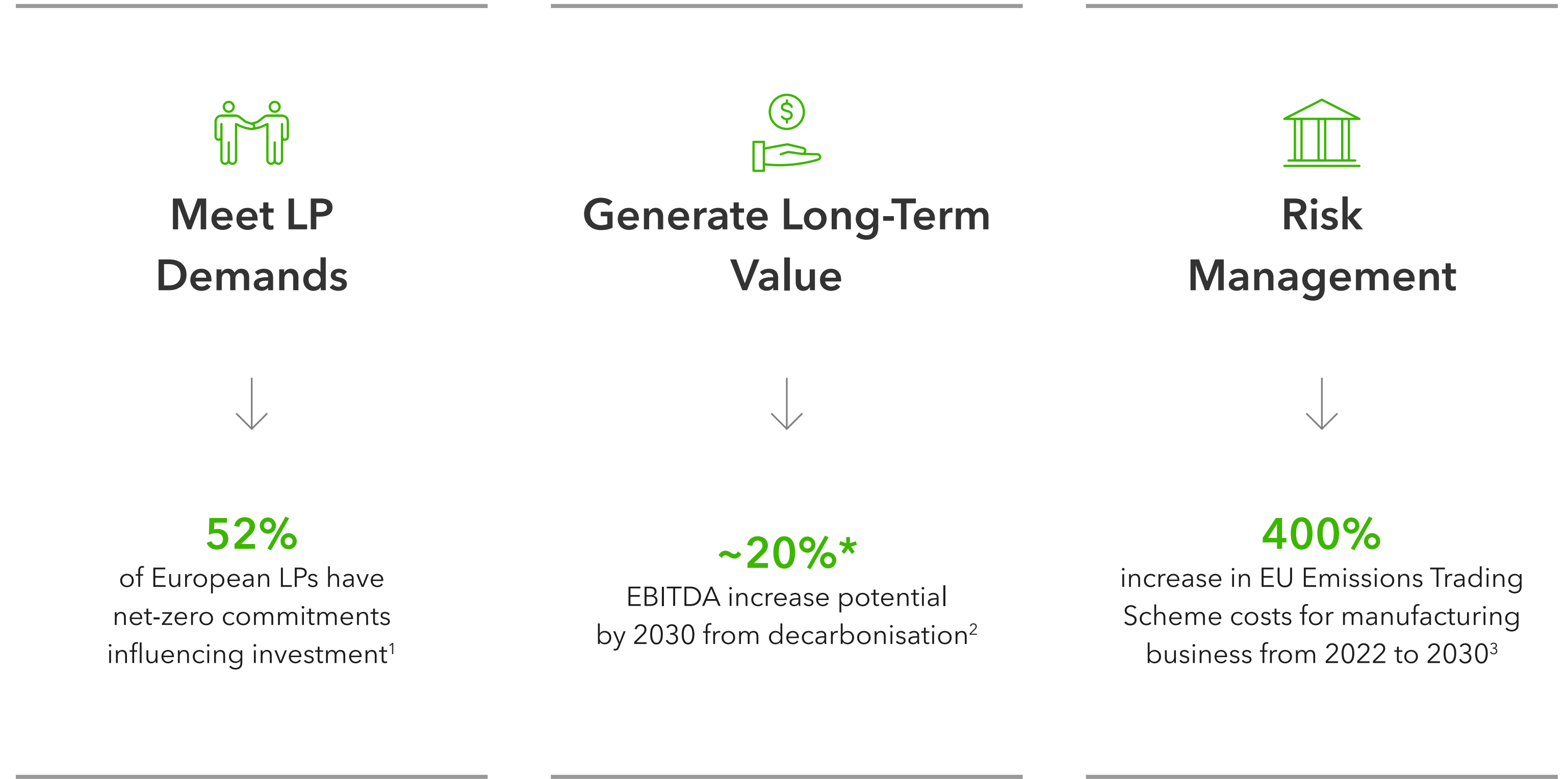


Valuing carbon during DD can help ensure that risks and opportunities are factored in the investment thesis & IC decision making, where material



Why integrate carbon valuation into the due diligence process?

Whilst this framework has been designed for the pre-investment process, its components can also be applied post-acquisition to help quantify and realize financial value.



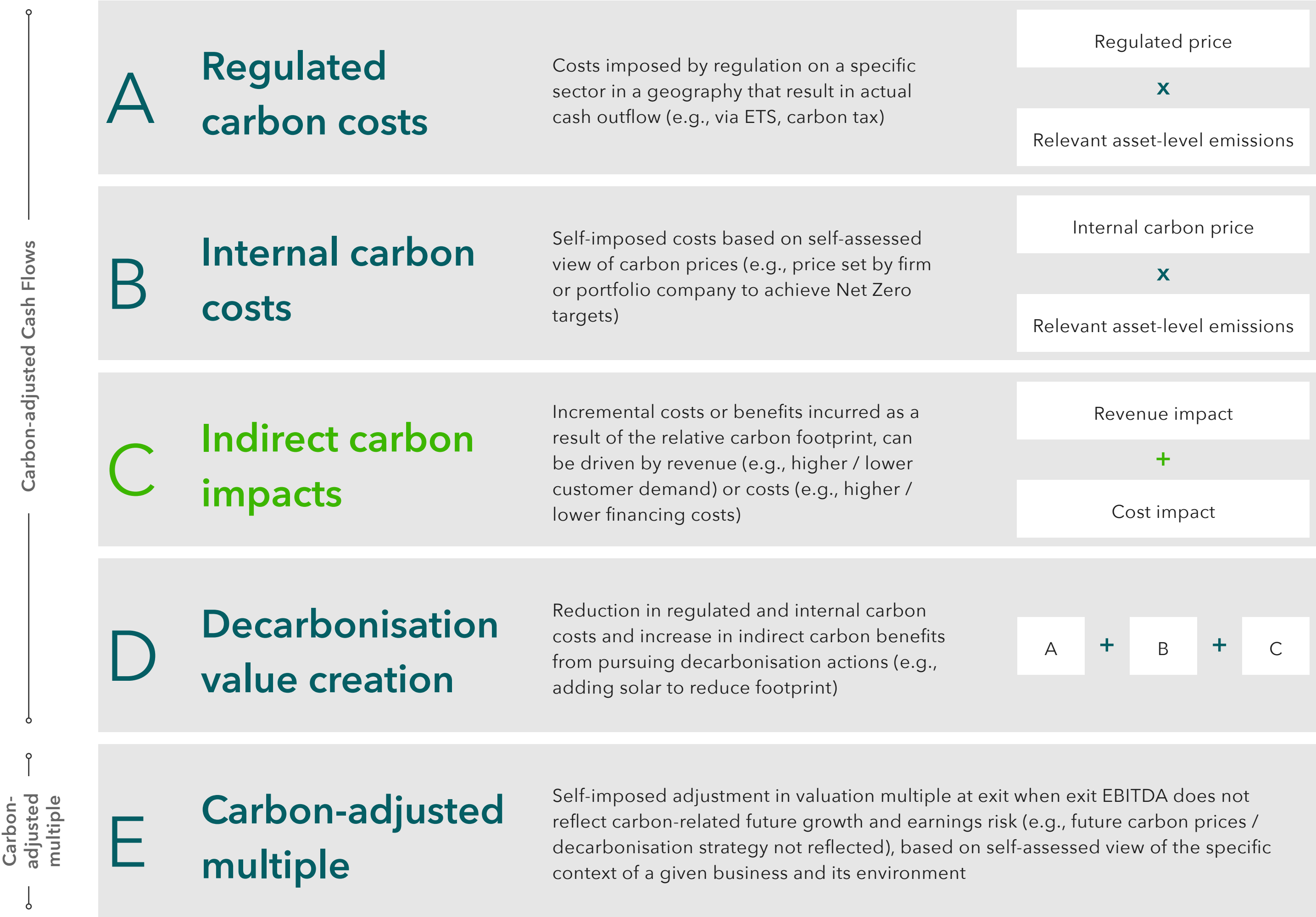
Sources: 1) [ILPA and Bain \(2022\)](#), 2) [McKinsey \(2023\)](#), 3) [European Roundtable on Climate Change and Sustainable Transition \(ERCST\)](#)

*Example of a large European luxury brand

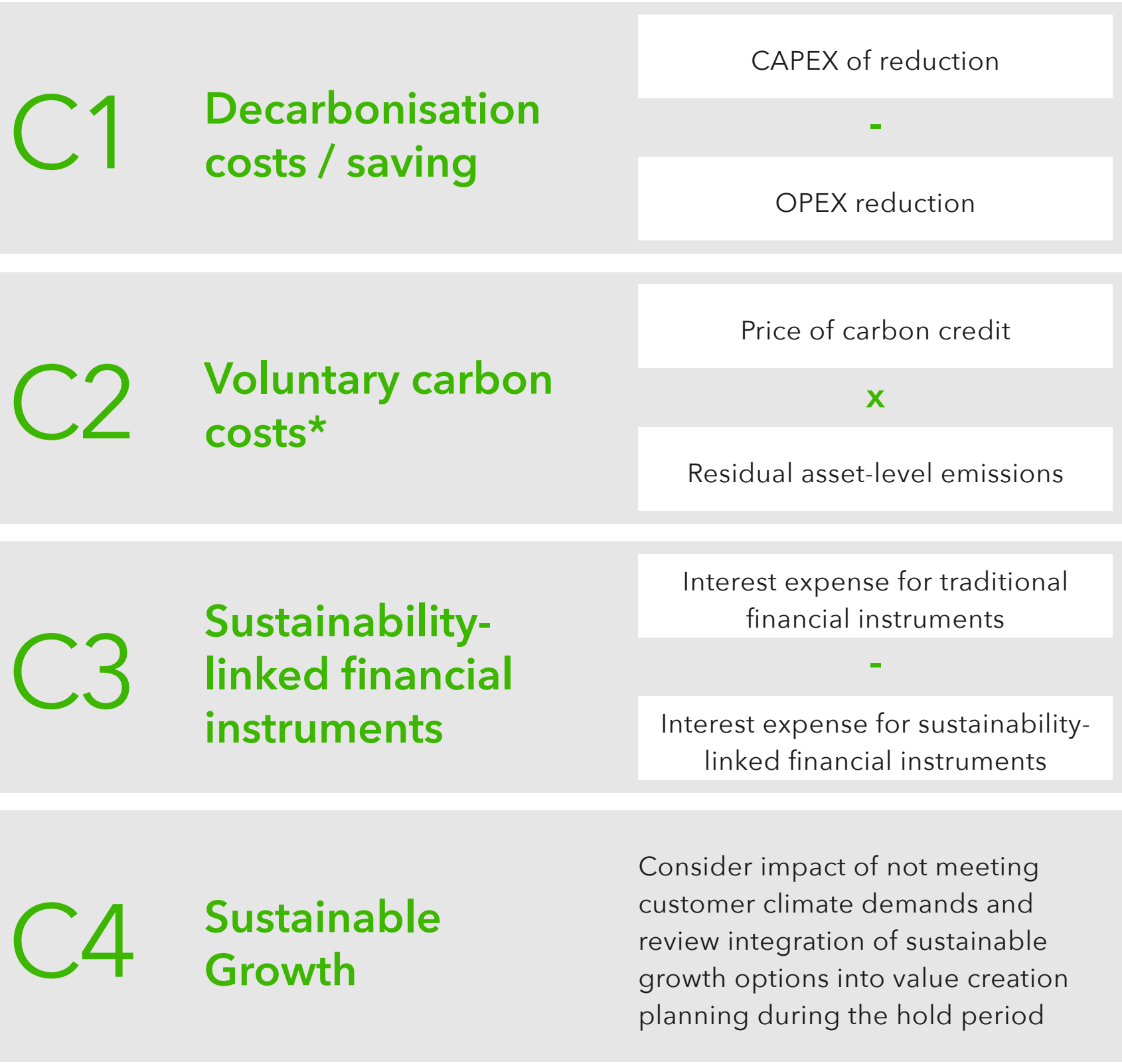


Building upon PESMIT's existing carbon valuation framework with practical guidance and additional detail on indirect carbon impacts

Overview | Carbon valuation framework components



Extended carbon valuation framework components



*Costs to address the impact of a company's unabated emissions, by investing in high-quality carbon credit portfolios that are aligned with their short and long-term mitigation strategies. Firms can decide whether, and the extent to which, they might participate in the voluntary carbon markets, i.e. non-regulated carbon markets, as part of their overall decarbonisation approach

Legend

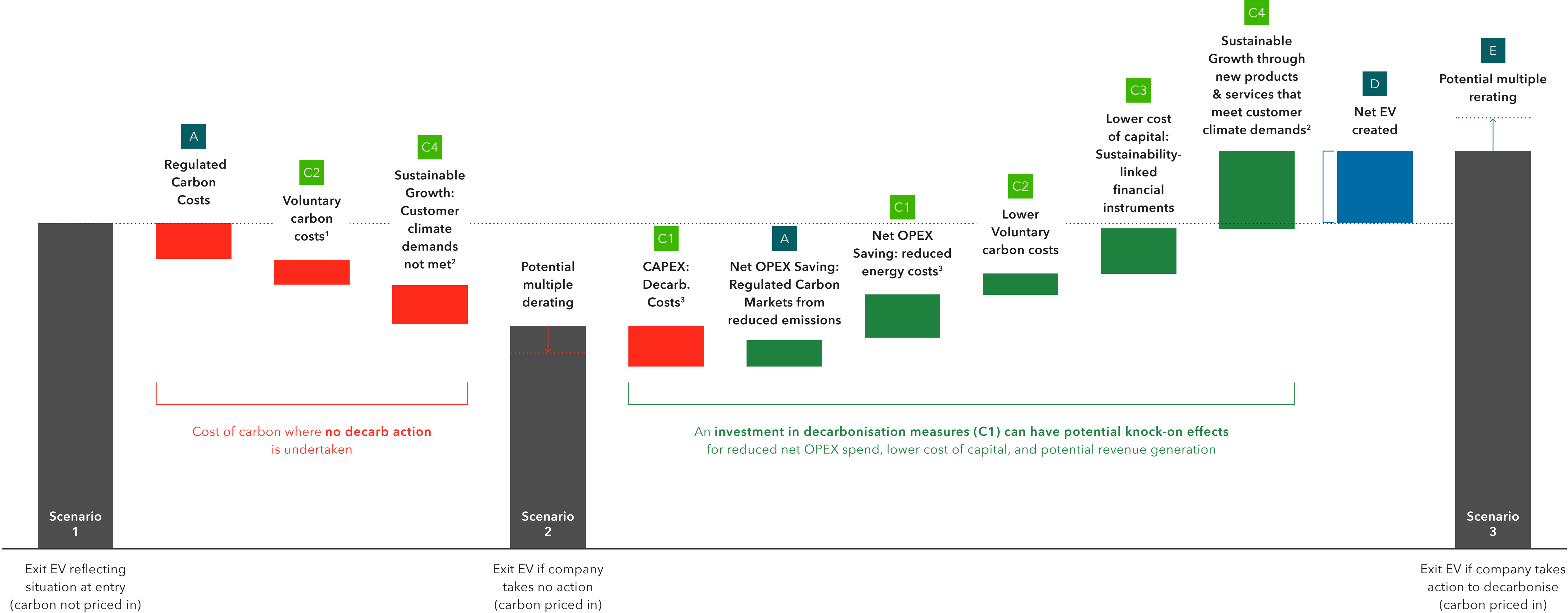
A-E Existing PESMIT Valuation Components

C 1-4 Extended PESMIT Valuation Components



By detailing the calculation for each component, this framework can help quantify total carbon enterprise value created

Illustrative example: not all components may be relevant for each deal, nor may have a positive impact on enterprise value depending on the circumstances



1) Assuming planned purchase of voluntary carbon credits
 2) When a company does not take decarbonisation action, there may be potential downside from not meeting customer climate demands. When the company does take decarbonisation action that meets customer climate demands, the value of its contracts may be protected, and there may be potential upside for new customer contracts
 3) Internal Carbon Price (B) does not result in actual cash outflows but acts as an enabler for decarbonisation measures, such as CAPEX investments (C1) and the purchase of voluntary carbon credits (C2). The ICP may however have a tangible impact on enterprise value ("EV") as perceived by the buy/sell side in the market



Carbon Valuation Playbook



A materiality-based approach to carbon valuation that can be incorporated into the existing due diligence process

Deal Teams can use this approach to assess the materiality of carbon during the DD process. Depending on their individual circumstances and approach, certain GPs may assess regulated and voluntary costs for all deals, whilst others may assess all material carbon valuation components.



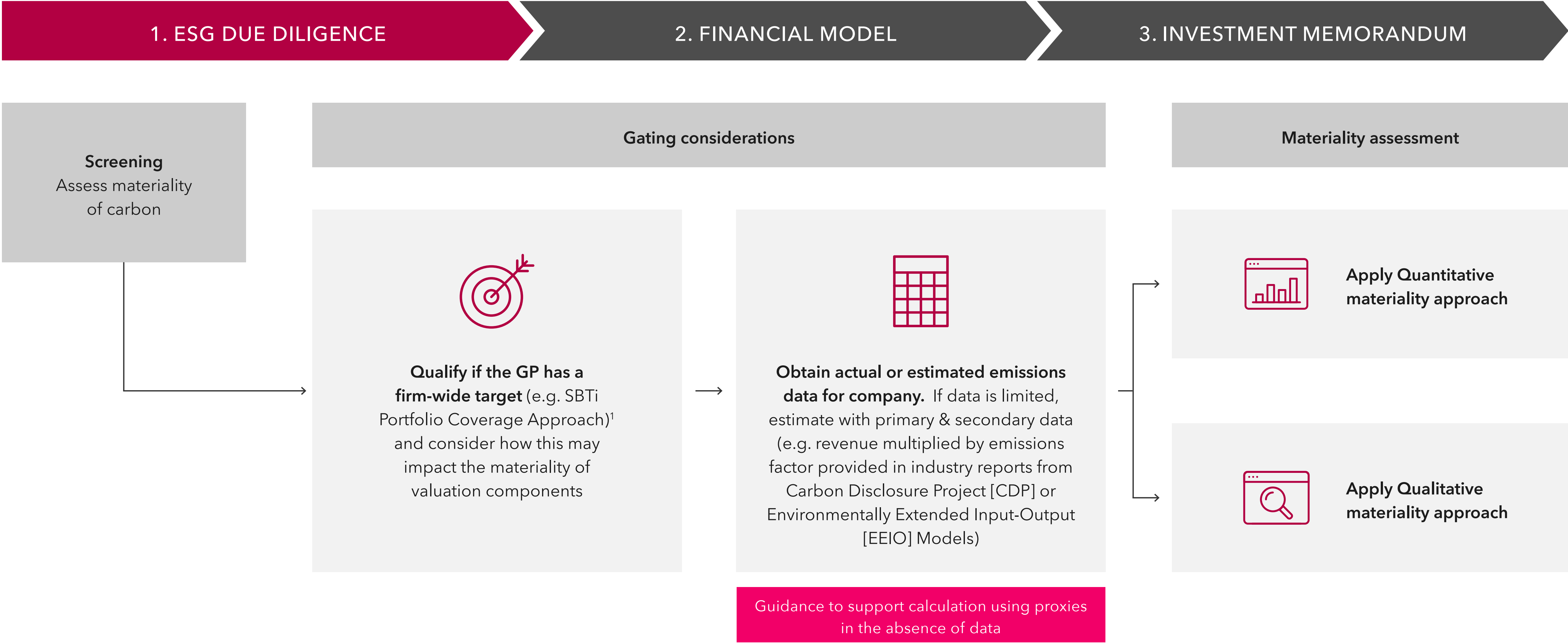
Materiality-based approach:

- Deal Team can focus their efforts on business-relevant carbon impacts, including sectoral relevance, customer requirements and value creation opportunities.
- Additionally, if the GP has a decarb target, this might be taken into consideration when evaluating the materiality threshold of climate in all investments.
- The DT makes a conclusion on the materiality of carbon. If it is material, it may be included in IC documentation.

- Legend**
- A** Regulated carbon costs
 - B** Internal carbon costs
 - C1** Decarbonisation costs / saving
 - C2** Voluntary carbon costs
 - C3** Sustainability-linked financial instruments
 - C4** Sustainable Growth
 - D** Decarbonisation value-creation (A+B+C)
 - E** Carbon-adjusted multiple



Materiality-based methods can help direct deal teams to business-critical carbon impacts



1) In its Private Equity sector guidance, the Science-Based Targets initiative defines the portfolio coverage approach as “an engagement-based approach where the GP commits to having a percentage of its portfolio with approved SBTs (Science-Based Targets) five years from the time the GP’s target is submitted to SBTi for official validation, so that the firm is on a linear path to achieve 100% SBT coverage by 2040 at the latest.” Further information is available in the [SBTi’s PE sector guidance](#).



GPs may decide to adopt a quantitative approach to determine the materiality of carbon by applying a proxy carbon price



Firms may develop their own interpretations of materiality based on their own assumptions of pass-through costs to Targets of carbon prices and its impact on sales or EBITDA as a percentage

1. Obtain, measure or estimate the company's emissions
2. Apply carbon price (*potential regulated or voluntary cost*)
3. Interpret implications for financial analysis and Value Creation Plans (VCPs)

Cash Flow / EBITDA implications when applying a carbon price to [YEAR] emissions

Scope 1	Ton CO ₂ e	×	\$ per ton CO ₂ e	×	% of cost	=	\$ Cash cost
Scope 2	Ton CO ₂ e	×	\$ per ton CO ₂ e	×	% of cost	=	\$ Cash cost
Scope 3	Ton CO ₂ e	×	\$ per ton CO ₂ e	×	% of cost	=	\$ Cash cost
							\$ [x]

[Click for additional guidance on how to define % of cost](#)

Carbon cash cost (to assess carbon materiality)

% of sales

% of Cash Flow / EBITDA¹

[Click for guidance on how to determine materiality](#)

\$ [x]	
%	Interpretation (e.g. minor)
%	Interpretation (e.g. minor)

Exit implications

	Without carbon price	With carbon price
EBITDA margin	%	%
IRR	%	%
MoM	x	x

1) Financial metric (e.g. Cash Flow or EBITDA) used is at the discretion of the Deal Team

Step 1: ESG Due Diligence Screening

PE firms may opt to screen for a subset of valuation components and determine the appropriate quantitative or qualitative screening criteria based on their sectors, risk, ambition, etc.

Topic	Screening criteria				Suggested action
	Quantitative approach		Qualitative approach		
	Criteria	Data source	Criteria	Data source	
Gating considerations	Not relevant		1. Does the GP have a decarbonisation target of its own? 2. Does the Target have a GHG emissions baseline?	Management question	Determine impact of acquiring business on target achievement and therefore relevance of valuation components Estimate emissions leveraging either consumption data (utilities, NG, fleet, etc.) or proxy data (e.g. revenue by sub-sector)
<u>A: Regulated Carbon Costs</u>	<ul style="list-style-type: none"> Emissions multiplied by a carbon price to determine the financial impact Financial materiality threshold* (e.g. carbon cash cost is at least [x%] of EBITDA) 	<ul style="list-style-type: none"> Carbon footprint data (estimated or reported) EBITDA or other metric sourced from deal team LBO Model Regulated carbon price within relevant markets World Bank Carbon Pricing Dashboard 	1. The target has operations located in markets that have current or forthcoming climate reg. (e.g. NA, EU and EEA), and the target's sector is covered by reg. mechanisms or anticipated to be included in the future (e.g. manufacturing, marine transport, aviation)	World Bank Carbon Pricing Dashboard	Determine potential exposure to current and future costs imposed by relevant regulation

LBO = Leveraged Buy Out | NA = North American | EU = European Union | EEA = European Economic Area |



Topic	Screening criteria				Suggested action
	Quantitative approach		Qualitative approach		
	Criteria	Data source	Criteria	Data source	
<u>B: Internal Carbon Costs</u>	<ul style="list-style-type: none"> Emissions multiplied by a carbon price to determine the financial impact. Financial materiality threshold* (e.g. internal carbon price is at least [x%] of EBITDA). 	World Bank Carbon Pricing Dashboard	<ol style="list-style-type: none"> The target set an internal carbon fee? Note, <i>this should not include a shadow carbon price¹, which includes no direct financial transactions</i> The GP set an internal carbon price (ICP)? 	<ul style="list-style-type: none"> World Bank Carbon Pricing Dashboard Management Question VDR access 	Include internal carbon price within carbon valuation
<u>C1: Decarbonisation Costs / Savings</u>	<ol style="list-style-type: none"> Obtain, measure or estimate the company's emissions Apply carbon price (potential regulated or voluntary cost) Financial materiality threshold* (e.g. carbon cash cost is at least [x%] of EBITDA) Interpret implications for financial analysis and VCPs 	<ul style="list-style-type: none"> Management question VDR Access CDP industry average data Carbon Border Adjustment Mechanism (CBAM) EU Emissions Trading System (ETS) Search by country in the Carbon Market Regulations Tracker (goldstandard.org) 	<ol style="list-style-type: none"> The company operates within a high (i.e. energy, data centers, heavy manufacturing) or medium emitting sector (i.e. consumer goods, real estate) The company has significant energy/fuel consumer and/or does it have a complex supply-chain? (This can be assessed using industry average CDP data) The company has an existing decarbonisation plan and / or targets 	<ul style="list-style-type: none"> VDR Access SASB Materiality Map CDP SBTi GHG Protocol Private Markets Decarbonisation Roadmap (PMDR) 	<p>Decarb. plan in place: Review credibility of existing decarb. plan (i.e. Capex/Opex/ROI) and include within carbon valuation</p> <p>or</p> <p>No decarb plan in place: Conduct a high-level outside-in review to identify potential value accretive emission reduction initiatives</p>

1) Shadow Carbon Pricing is a methodology that quantifies risks and opportunities for new investments in CO₂ emissions, created based on the recommendations of the Paris Agreement to establish carbon prices

Topic	Screening criteria				Suggested action
	Quantitative approach		Qualitative approach		
	Criteria	Data source	Criteria	Data source	
<u>C2: Voluntary Carbon Costs</u>	Financial materiality threshold (e.g. carbon cash cost is at least [x%] of EBITDA)	<ul style="list-style-type: none"> Carbon footprint data (estimated or reported) EBITDA or other metric sourced from deal team LBO Model Estimated price of carbon credits 	<ol style="list-style-type: none"> The company already purchases carbon credits The company has an emissions target which requires future commitments to offset residual emissions 	<ul style="list-style-type: none"> VDR Access AlliedOffsets Trove Research Bloomberg 	Determine current and future costs of carbon credits and determine if costs are integrated into financial planning
<u>C3: Sustainability-linked financial instruments</u>	Calculate the difference in interest expense between Sustainability-linked financial instruments and regular credit facilities. Check for material differences	<ul style="list-style-type: none"> Bloomberg CapitalIQ Factset 	<ol style="list-style-type: none"> The company or GP has a sustainability-linked financial instrument The company or GP planning on taking a sustainability-linked financial instrument 	Management question	Review interest rate on comparable loans for Companies with a strong ESG performance who are eligible for sustainability-linked financial instruments
<u>C4: Sustainable Growth</u>	Financial materiality threshold (e.g. the company generate [x%] of revenue or sales from sustainable products or services or from customers that have defined targets (e.g. SBTs) which will impact their ability to do business with them)	<ul style="list-style-type: none"> Management Question VDR access 	<ol style="list-style-type: none"> The company identified near adjacencies for green growth opportunities The company's customers have climate demands that have implications for current and future contracts Competitors are developing/ deploying low carbon alternatives that could displace this product/service 	<ul style="list-style-type: none"> Management Question VDR access 	Determine relevant next steps post-closing as part of broader value creation planning

Step 1: ESG Due Diligence Valuation

Valuation component	Relevance and value creation	Example relevant regulations	Data needed	Suggested action
<u>A: Regulated Carbon Costs</u>	<ul style="list-style-type: none"> Regulated carbon markets are increasing in geographic and industry scope Consider pass through emissions and how carbon regulations may impact multiple firms in value chain Assess future costs against potential savings associated with decarbonisation initiatives 	<ul style="list-style-type: none"> Carbon Border Adjustment Mechanism (CBAM) EU Emissions Trading System (ETS) - California Cap-and-Trade Program 	<ul style="list-style-type: none"> Current & projected regulated price of carbon within the markets where the asset is operational during hold period Current & projected emissions 	<ul style="list-style-type: none"> Select appropriate carbon price based on relevant regulations Calculate regulated carbon cost (price x emissions) Apply methodology for A
<u>B: Internal Carbon Costs</u>	<ul style="list-style-type: none"> While an internal carbon price (ICP) does not always result in cash outflows, it can help direct current investment decisions However, the ICP can create cash outflows if a firm has decided to use these to purchase carbon credits Setting an ICP creates a budgetary incentive for efficiency changes to minimize carbon 	NA	<ul style="list-style-type: none"> Current and project Internal Carbon Price (ICP) for Asset Current & projected emissions 	<ul style="list-style-type: none"> Determine if Target has an ICP If so, calculate current price and estimate future curve for emissions Apply methodology for B
<u>C1: Decarbonisation Costs / Savings</u>	<ul style="list-style-type: none"> CAPEX & OPEX impacts of implementing decarbonisation initiatives Implementing energy-efficient technologies and processes to reduce operational costs 	<ul style="list-style-type: none"> European Green Deal U.S. Clean Power Plan U.S. Energy Star certification program 	<ul style="list-style-type: none"> Target decarbonisation plans with CAPEX & OPEX projections Current & projected emissions Company WACC or hurdle rate 	<ul style="list-style-type: none"> Calculate the cost of decarbonization and OPEX reduction potential Apply methodology for C1

Key outcomes

Inputs to support incorporation of carbon valuation to the operating model, financial and value creation case

Valuation component	Relevance and value creation	Example relevant regulations	Data needed	Suggested action
<u>C2: Voluntary Carbon Costs</u>	<ul style="list-style-type: none"> Voluntary carbon costs associated with best practice target-setting for near-term reduction and/or Net-Zero alignment Consider future voluntary carbon costs associated with decarbonisation 	Search by country in the Carbon Market Regulations Tracker (goldstandard.org)	<ul style="list-style-type: none"> Voluntary carbon credit price Company growth projections (CAGR) Emissions data 	<ul style="list-style-type: none"> Determine if Target has considered current and future costs of voluntary carbon credits Check for obligations under targets (e.g. is the company signed up to SBT Net-Zero where the residual will need offsetting from a future year?) Apply methodology for C2
<u>C3: Sustainability-Linked Financial Instruments</u>	<ul style="list-style-type: none"> DD is an opportunity to identify financiers for green investments, preferential interest rates may be available from financiers Sustainability-linked financial instruments and ESG margin ratchets may reduce the cost of capital by offering lower interest rates or favorable terms to GPs or target companies that achieve sustainability performance targets 	NA	<ul style="list-style-type: none"> Company size Company geography Loan maturity Corporate bond proxy Corporate sustainability-linked / green bond proxy 	<ul style="list-style-type: none"> Estimate reduction in interest expense via ESG rating as a benchmark Check adherence to sustainability/green instrument guidance, e.g., Loan Market Association's Sustainability Linked Loan Principles (SLLP) Apply methodology for C3
<u>C4: Sustainable Growth</u>	<ul style="list-style-type: none"> (Not) meeting customer climate demands can have material financial impact on existing and new customer contracts Dependent on company sector and markets, but potential levers include green premium, product design, logistics & supply chain A green revenue assessment evaluates opportunities across business KPIs to arrive at high value green levers to test what would create bottom line growth for the company 	NA	<ul style="list-style-type: none"> This could include, but is not limited to: Financial data of customer contracts lost, protected or won because of (not) meeting customer climate demands Analysis with B2B/B2C customers to prioritise product features Total unduplicated reach and frequency (TURF) analysis to provide market potential estimates Van Westendorp Analysis to determine propensity to pay a green premium 	<ul style="list-style-type: none"> If a company has identified near adjacencies for green growth opportunities, consider actioning commissioned study Apply methodology for C4

Key outcomes

Inputs to support incorporation of carbon valuation to the operating model, financial and value creation case



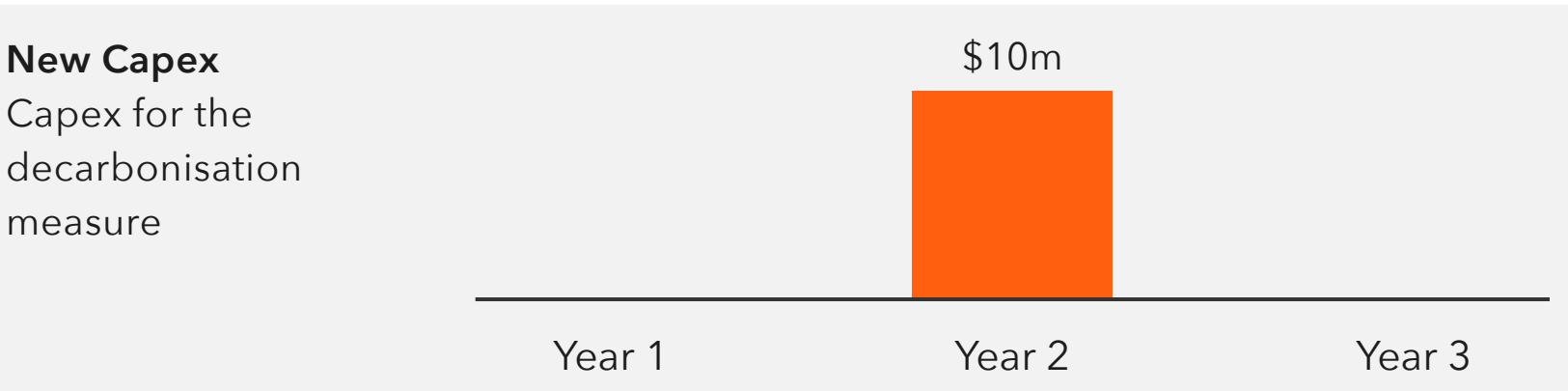
Step 2: Financial model

Cash flow impact

Illustrative example: Financial projection, including Capex and Opex analysis to estimate decarb costs, for implementing emission reduction initiatives compared with BAU scenarios. This is [component D](#) in the Framework.

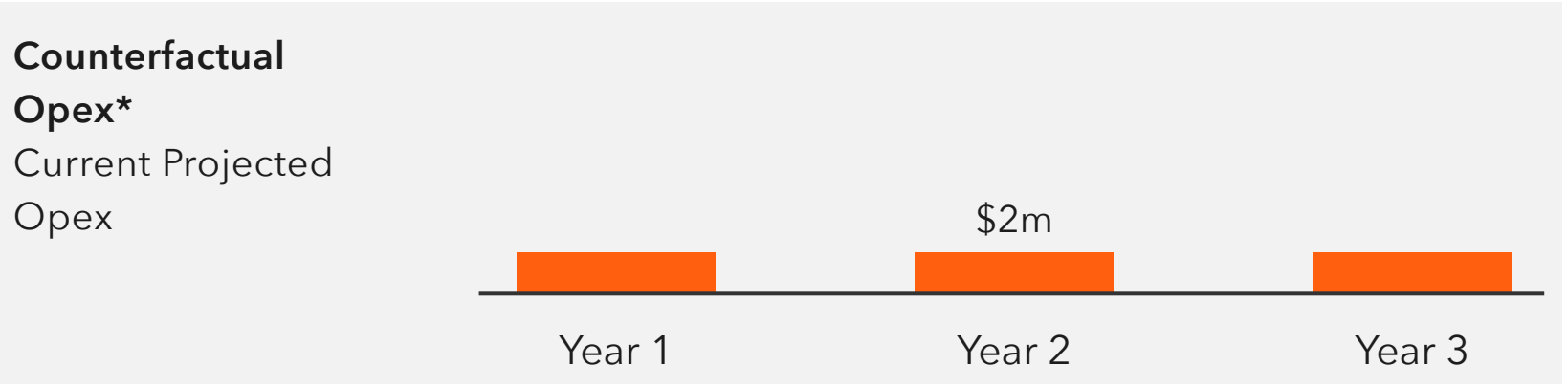
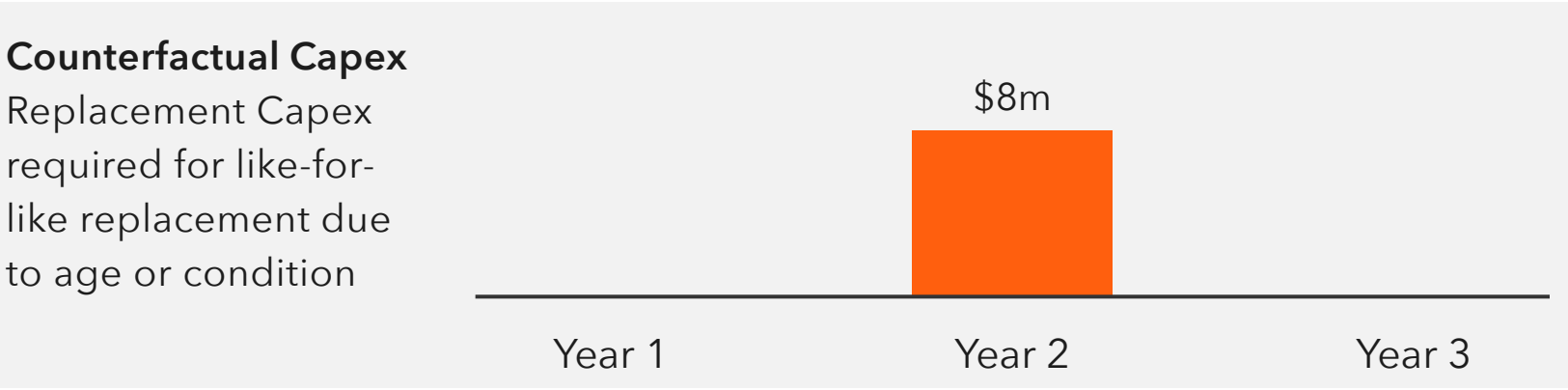
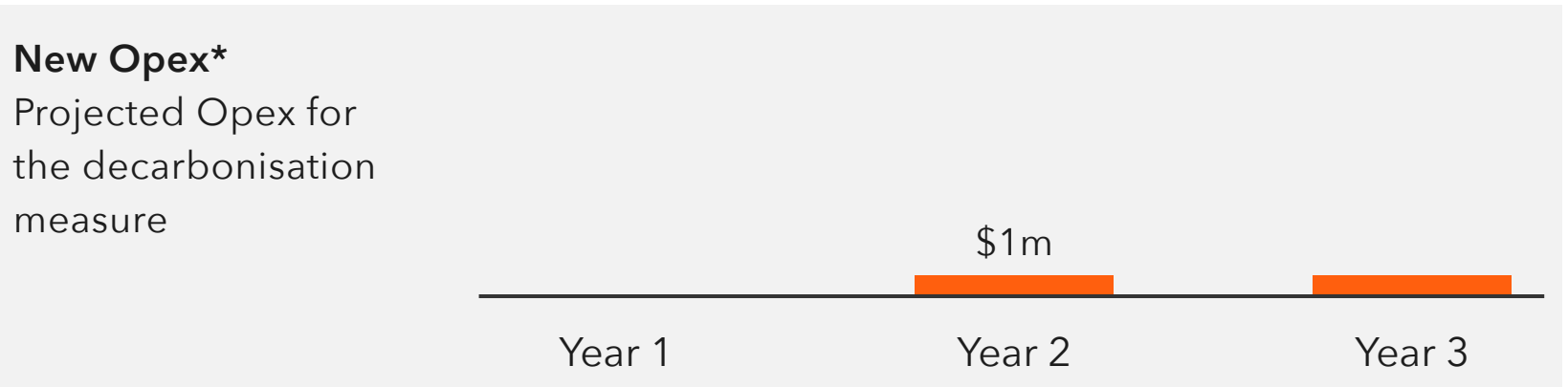
CAPEX

in USD or Local Currency



OPEX

in USD or Local Currency



*Changes with Projected Energy Costs

Examples of LBO model integration

- **Adjust Cash Flows:** Incorporate the estimated carbon costs and cost savings into the company's free cash flow calculation, including any expected pass-through costs
- **Capital Expenditures:** Include potential investments needed for carbon reduction initiatives or compliance with future regulations
- **Leverage Ratios and Debt Service Coverage Ratio:** Reflect impact of carbon in Leverage Ratios and Debt Service Coverage Ratio (DSCR) to assess whether the company can meet its debt covenants and obligations with the adjusted cash flows

Sensitivity testing

- **Sensitivity Analysis:** Perform analysis to understand what variables (e.g. scope 1,2,3 emissions, carbon price, % pass through, etc.) affect the company's financials.

Step 2: Financial model

Valuation adjustment

For comprehensive valuation, Deal Teams can consider integrating governance factors as relevant and/or material. After calculating Cash Flow impacts, Enterprise Value drivers can be adjusted based on the maturity of the target's governance structure and other unquantified factors.

Considerations for valuation adjustment

Board Oversight and Accountability:

- ✓ Strong management and efficient capital allocation may suggest that a value accretive decarbonisation plan will be implemented
- ✗ Poor management and inefficient capital allocation may suggest that the implementation of a value accretive decarbonisation plan is less likely

Reputation and Market Perception:

- ✓ Good governance practices can enhance the company's reputation, leading to better market perception, increased revenue from sustainable growth offerings and higher valuation
- ✗ Controversies of any kind may reduce the operational focus of management on decarbonisation and erode market trust in future measures (e.g. sustainable growth offerings)

Regulatory Compliance:

- ✓ Strong governance can help ensure adherence to environmental regulations, reducing the risk of fines and sanctions
- ✗ Weak governance may increase the risk of fines and sanctions

Practical application to valuation



Discount Rate:

Quality of risk management can justify a lower/higher discount rate in DCF analysis



Post-business plan growth:

Governance practices can affect growth prospects post hold period, which can justify an upward/downward adjustment of the terminal growth rate



Exit Multiple:

Current market valuation of companies with comparable governance structures and risk profiles can justify an adjustment to the exit EBITDA multiple

Step 3: Investment Memorandum (IM)

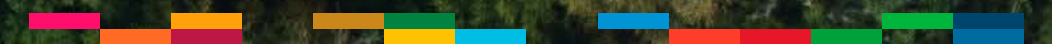
The materiality-based approach is intended to focus attention on significant carbon risks and value creation opportunities.

In preparing the investment memorandum, deal teams may consider:

- **Developing a systematic process for deal teams, with consistent inputs and outputs** for the investment memorandum for comparison over time
- **Explaining inclusion of carbon valuation on materiality basis**
- **Summarising Cash Flow Impact** potential as quantified using the methodology
- Discussing **transition planning** and the ability of management to deliver

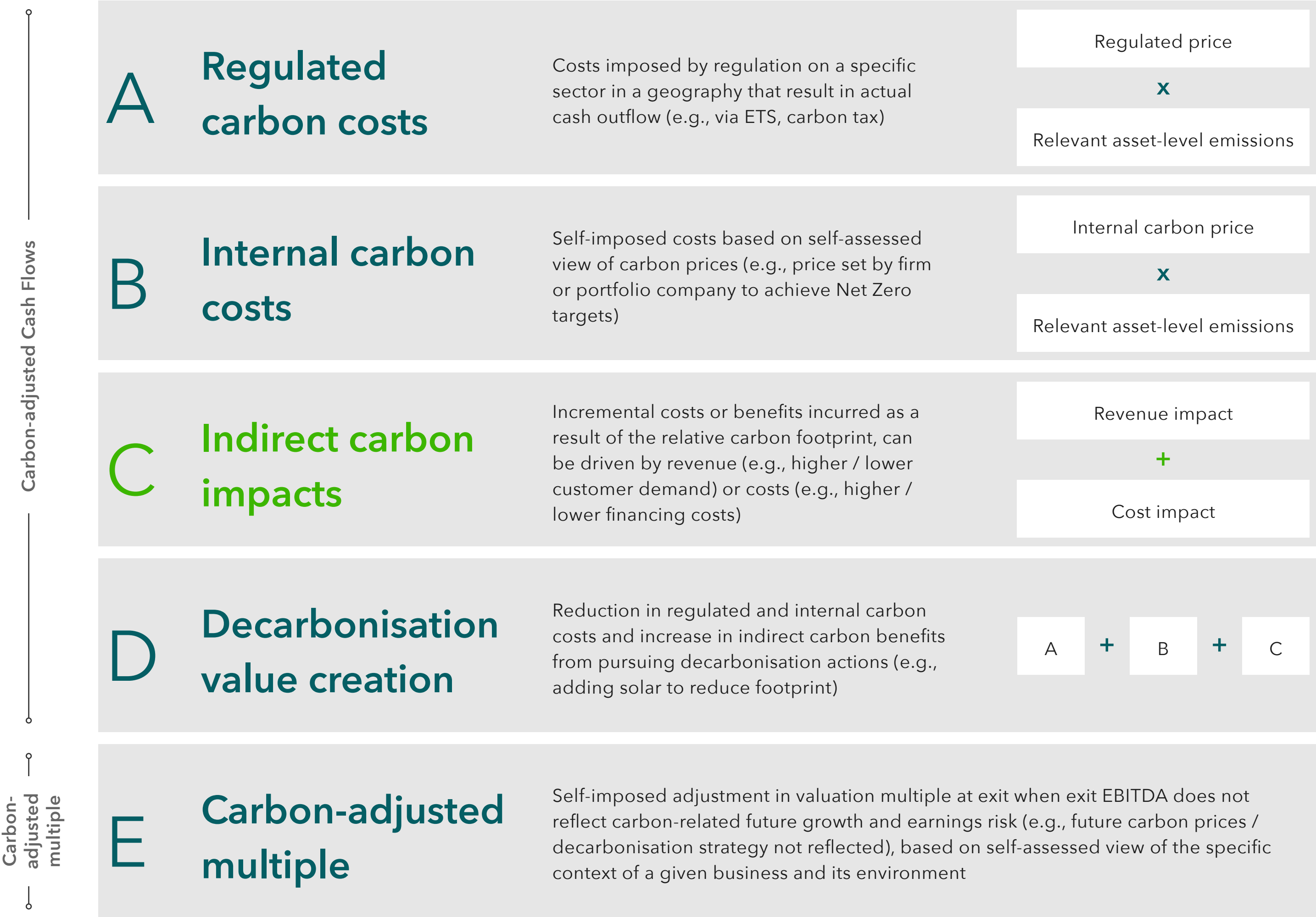


Methodology for Valuation Components

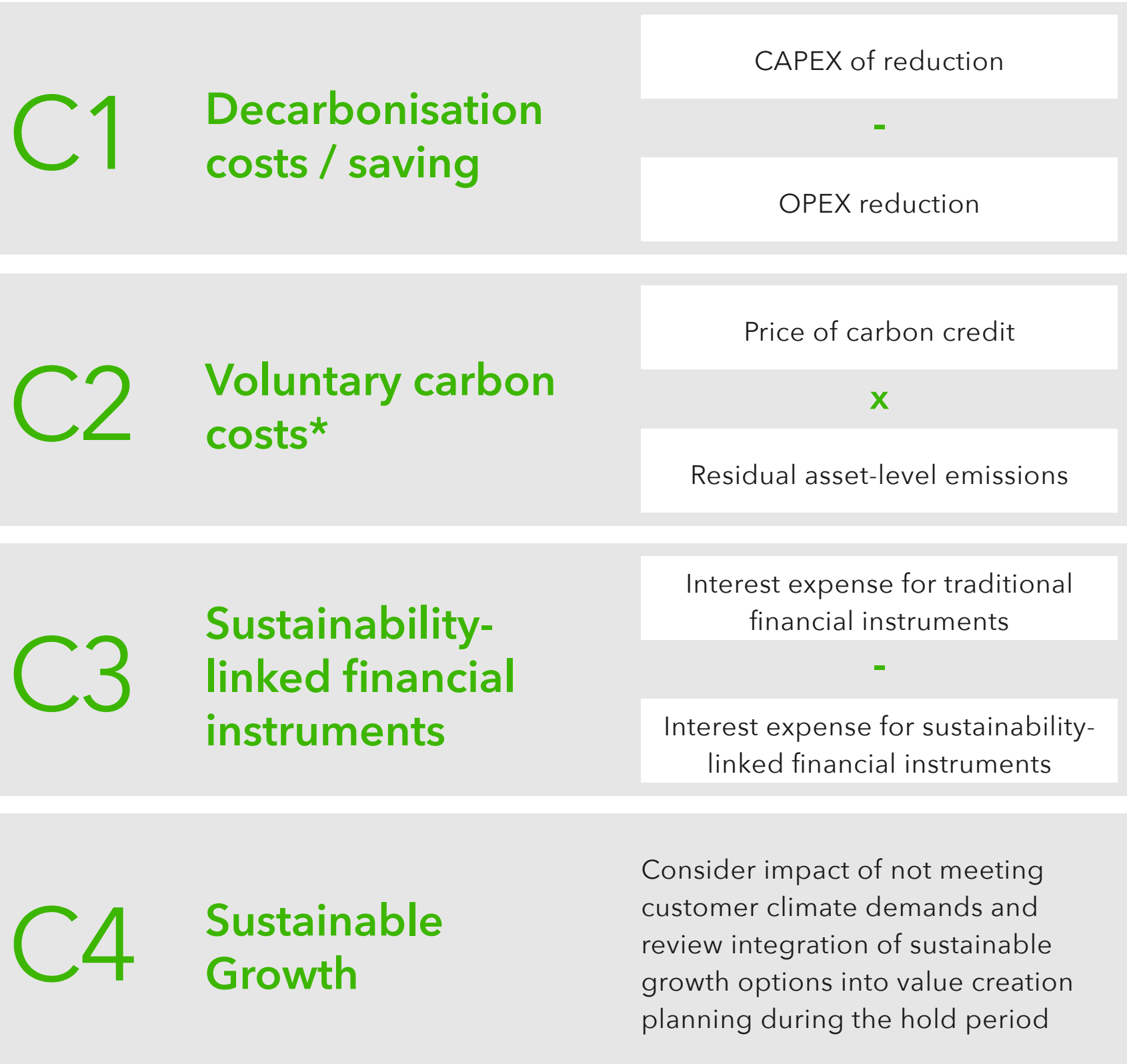


Building upon PESMIT's existing carbon valuation framework with practical guidance and additional detail on indirect carbon impacts

Overview | Carbon valuation framework components



Extended carbon valuation framework components



*Costs to address the impact of a company's unabated emissions, by investing in high-quality carbon credit portfolios that are aligned with their short and long-term mitigation strategies. Firms can decide whether, and the extent to which, they might participate in the voluntary carbon markets, i.e. non-regulated carbon markets, as part of their overall decarbonisation approach

Legend

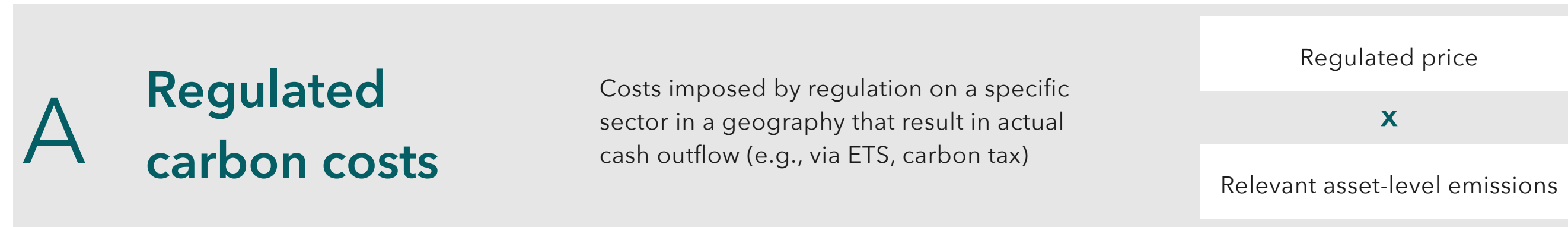
- A-E Existing PESMIT Valuation Components
- C 1-4 Extended PESMIT Valuation Components



Component A: Regulated carbon costs

Adjusting Cash Flows for costs imposed by regulations or compliance markets, often on a specific sector and geography

Adjusting for regulated carbon costs



When is this potentially applicable?

If the asset has operations in markets and sector where emissions categories are included within regulatory mechanisms

Calculation

FORMULA



INPUTS



CALCULATION



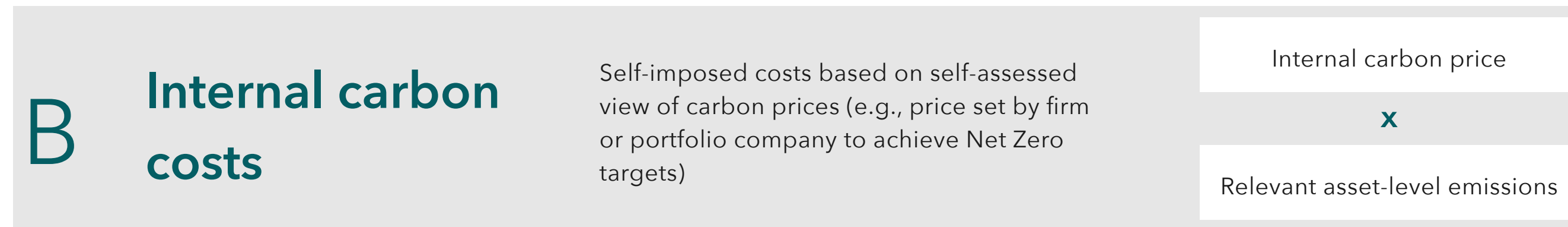
Input	Data needed	Data sources
1	Regulated market price in relevant geography	IEA WEO 2022
2	Regulated market price in relevant geography	IEA WEO 2022
3	Emissions data	Target data (VDR)
4	Emissions data	Target data (VDR) & assumptions on emissions projections
5	% of cost attributed to the target that cannot be passed through	Assumptions on pass-through cost %



Component B: Internal carbon costs

Adjusting Cash Flows for a firm or portfolio company's internal / proprietary view of carbon prices

Adjusting for internal carbon costs



When is this potentially applicable?

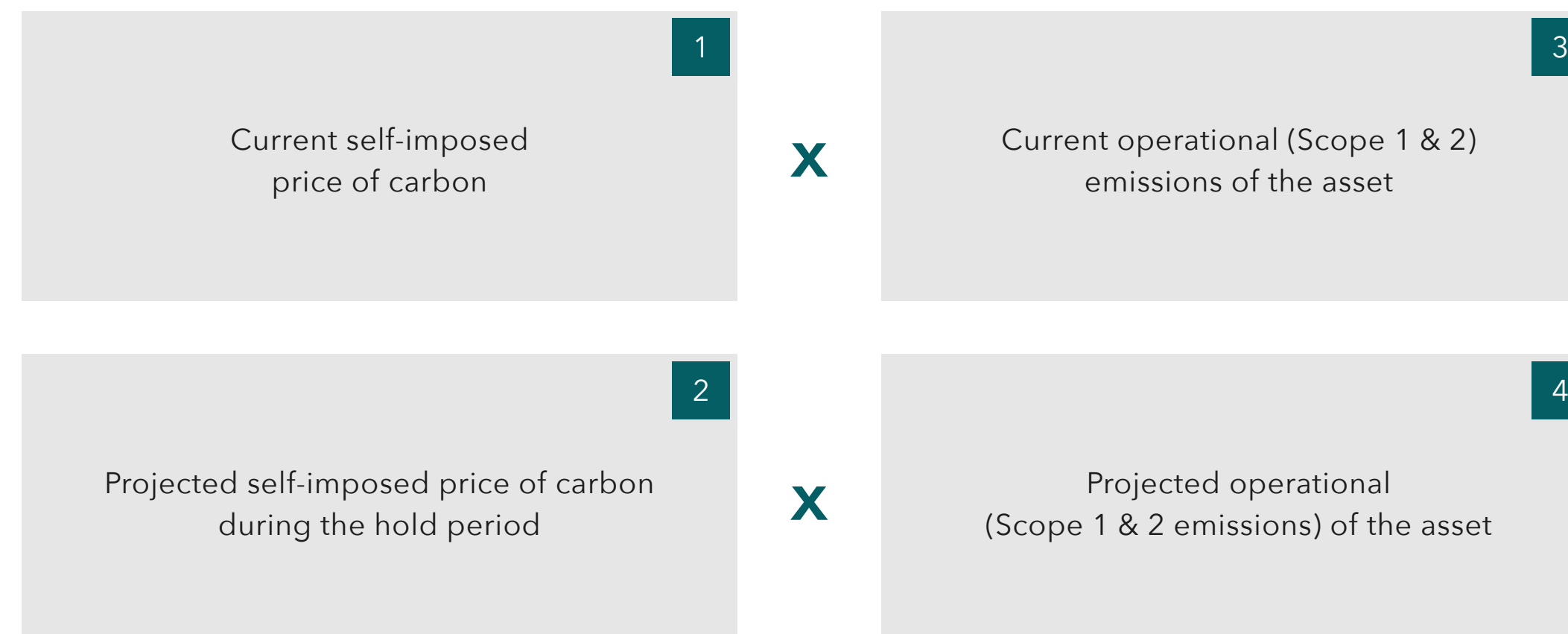
Only if the company has implemented an internal carbon price mechanism (excluding a shadow carbon price)

Calculation

FORMULA



INPUTS



Input	Data needed	Data sources
1	Internal carbon price set by company, usually informed by regulated market price, voluntary market price, peer internal carbon price	Target data (VDR)
2	Internal carbon price set by company, usually informed by regulated market price, voluntary market price, peer internal carbon price	Target data (VDR)
3	Emissions data	Target data (VDR)
4	Company growth projections (CAGR) and Emissions data	Target data (VDR)



Component C1: Decarbonisation costs / savings

Adjusting Cash Flows for incremental CAPEX of reducing carbon emissions and resulting OPEX reduction

Adjusting for decarbonisation costs / saving

C1

Decarbonisation costs / savings

Incremental CAPEX, maintenance and investment OPEX, and OPEX reductions as a result of reducing the relative carbon footprint of the target, discounted to present value with an NPV calculation

NPV of:

CAPEX of reduction
-
OPEX reduction

When is this potentially applicable?

Only if the company has emissions that are deemed material based on industry average data

Calculation

FORMULA

$$\text{CAPEX of reduction measures} - \text{NPV of: OPEX reduction realised per annum}$$

TOTAL COST / SAVING

$$\text{Unit abatement cost*} \times \text{tCO}_2\text{e to abate in line with any existing portfolio company or fund-level commitment}$$

UNIT ABATEMENT COST

$$\frac{\text{Estimated incremental CAPEX investment to reduce emissions in line with Paris-agreement \& additional investment and maintenance OPEX} - \text{Estimated OPEX reduction because of reduced consumption and emissions}}{\text{Discount rate (WACC or hurdle rate)}}$$

*A positive NPV leads to a negative abatement cost, which is a saving

Input	Data needed	Data sources
1	Unit abatement cost per tCO ₂	<ul style="list-style-type: none"> Calculation based on 1-3 Cost of carbon (e.g. voluntary carbon cost)
2	Total tCO ₂ e to abate	<ul style="list-style-type: none"> Target data (VDR)
3	Decarbonisation plan with CAPEX projections	<ul style="list-style-type: none"> Target data (VDR) if available CDP IPCC reports
4	Decarbonisation plan with OPEX projections	<ul style="list-style-type: none"> Target data (VDR) if available CDP IPCC reports
5	Company WACC or hurdle rate	<ul style="list-style-type: none"> Target data (VDR) Calculated during FDD

[Click for guidance for identifying decarb levers](#)



Component C2: Voluntary Carbon costs

Adjusting Cash Flows for a firm or portfolio company's voluntary carbon costs

Adjusting for voluntary carbon costs

C2

Voluntary carbon costs

Costs to address the impact of a company's unabated emissions, by investing in high-quality carbon credit portfolios that are aligned with their short and long-term mitigation strategies

Price of carbon credit

x

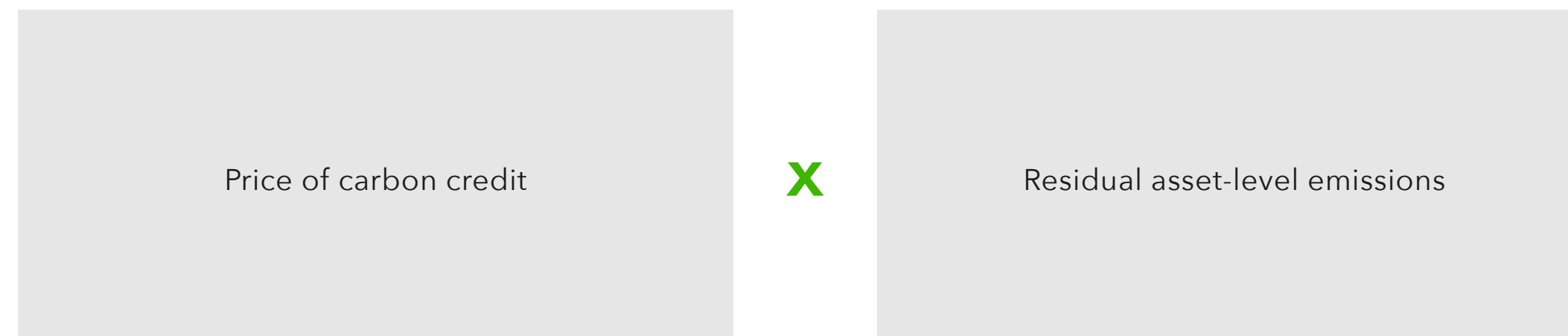
Residual asset-level emissions

When is this potentially applicable?

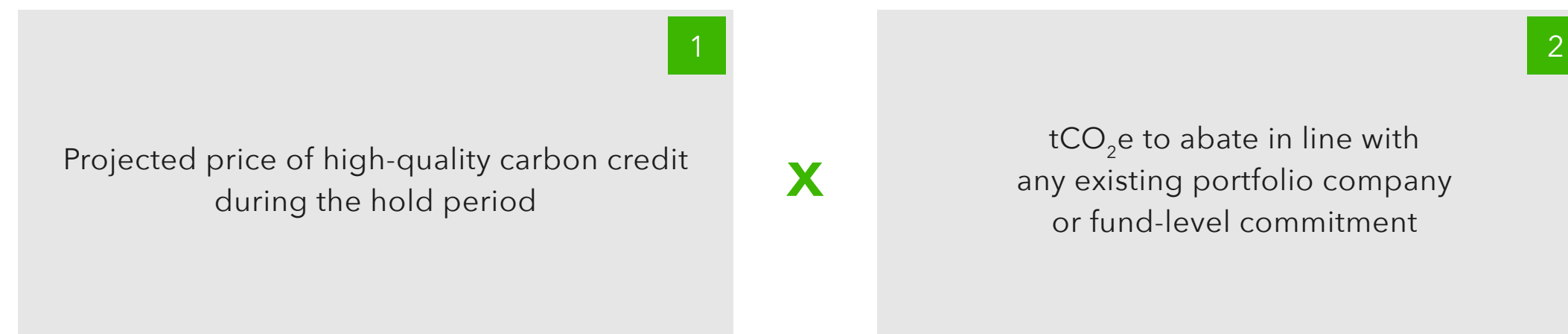
Does the company already purchase carbon credits and have a budgeted strategy for further purchases? If Yes, not applicable as cost included already in EBITDA

Calculation

FORMULA



INPUT



Input	Data needed	Data sources
1	<ul style="list-style-type: none"> • Voluntary carbon credit price 	<ul style="list-style-type: none"> • AlliedOffsets • Trove Research • Bloomberg
2	<ul style="list-style-type: none"> • Company growth projections (CAGR) • Emissions data 	<ul style="list-style-type: none"> • Target data (VDR)



Component C3: Sustainability-linked financial instruments

Potential value creation opportunity from improved financing terms linked to sustainability performance¹

Potential value creation from improved financing terms

C3

Sustainability-linked financial instruments

Sustainability-linked financial instruments can reduce the cost of capital by offering lower interest rates or favorable terms to borrowers who meet sustainability criteria, thus incentivizing environmentally friendly projects and practices

Interest expense for traditional financial instruments

-

Interest expense for sustainability-linked financial instruments

When is this potentially applicable?

If the company is using or planning on using sustainability-linked financial instruments as part of its value creation plan

Calculation

FORMULA

$$\text{Interest expense for traditional financial instruments} - \text{Interest expense for sustainability-linked financial instruments}$$

INPUTS

<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> Characteristics for traditional financial instrument (company size, country risk premium, maturity) 1 </div>	<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> Characteristics for sustainability-linked financial instruments (company size, country risk premium, maturity) 2 </div>
<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> Interest rate on comparable traditional financial instruments 3 </div>	<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> Interest rate on comparable sustainability-linked financial instruments 4 </div>

Input	Data needed	Data sources
1	<ul style="list-style-type: none"> Company size Company geography Traditional financial instrument maturity 	<ul style="list-style-type: none"> Target data (VDR)
2	<ul style="list-style-type: none"> Company size Company geography Sustainability-linked financial instrument maturity 	<ul style="list-style-type: none"> Target data (VDR)
3	<ul style="list-style-type: none"> Corporate financial instrument proxy 	<ul style="list-style-type: none"> Bloomberg CapitalIQ Factset
4	<ul style="list-style-type: none"> Corporate sustainability-linked financial instrument proxy 	<ul style="list-style-type: none"> Bloomberg CapitalIQ Factset

1) There is a risk of not meeting the KPI targets for sustainability-linked financial instruments, which could affect the margin ratchets. However, the impact is typically minimal, with the basis point difference being relatively small compared to the potential savings in interest expenses from using these instruments. ERM industry experience indicates that generally only a few basis points are at stake for each KPI that is met or not met. The deal team assesses the risk of not meeting these KPI targets.



Component C4: Sustainable Growth

Potential value destruction from not meeting customer climate requirements & value protection & potential creation from meeting these requirements can be estimated during the DD process to quantify the potential impact of decarbonization (in)action

Potential value impacts of (not) meeting customer climate targets

C4

Sustainable Growth

When a company does not take decarbonisation action, there is potential downside from not meeting customer climate demands. When the company does take decarbonisation action that meets customer climate demands, the value of its contracts is more likely to be protected, and there may be upside for new customer contracts

When is this potentially applicable?

If a company has customers with decarbonization goals, reflected in the customer contracts

Categories

	POTENTIAL DOWNSIDE	POTENTIAL UPSIDE	
WHAT	Value destruction: lost customer contracts because target does not meet customer climate demands	Value protection: retained customer contracts because target meets customer climate demands after decarbonisation measures	Value creation: new customer contracts because target meets new customer climate demands after decarbonisation measures
INPUTS	Revenue or EBITDA of lost contracts 1	Revenue or EBITDA of protected contracts 2	Revenue or EBITDA of new contracts 3
	Customer decarbonization targets 4		

Input	Data needed	Data sources
1	<ul style="list-style-type: none"> Lost customer contract revenue Lost customer contract EBITDA (margin) 	<ul style="list-style-type: none"> VDR Management question
2	<ul style="list-style-type: none"> Protected customer contract revenue Protected customer contract EBITDA (margin) 	<ul style="list-style-type: none"> VDR Management question
3	<ul style="list-style-type: none"> New customer contract revenue New customer contract EBITDA (margin) 	<ul style="list-style-type: none"> VDR Management question
4	<ul style="list-style-type: none"> Customers decarbonization targets 	<ul style="list-style-type: none"> VDR SBTi Target Website Target customer's website



Component C4: Sustainable Growth

Potential value creation opportunities from sustainable growth opportunities can be considered during the DD process, but without sufficient time and data, this is likely to only be a qualitative consideration to prepare for post-transaction value creation planning

Potential value impacts of (not) meeting customer climate targets

C4

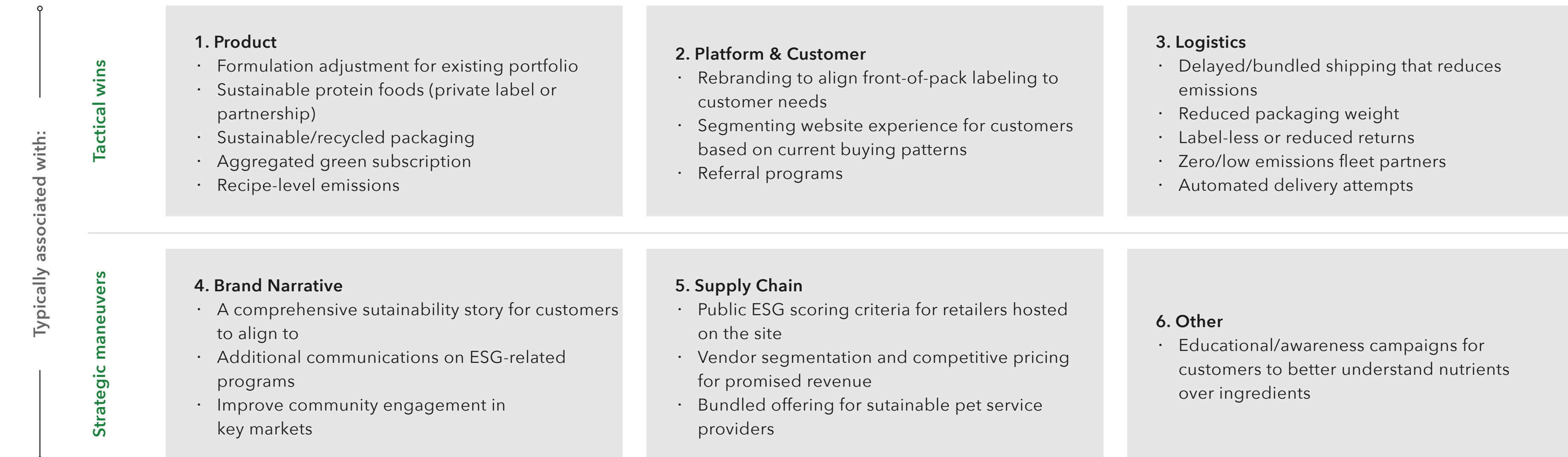
Sustainable Growth

When a company does not take decarbonisation action, there is potential downside from not meeting customer climate demands. When the company does take decarbonisation action that meets customer climate demands, the value of its contracts is protected, and there is upside for new customer contracts

When is this potentially applicable?

If a company has customers with decarbonization goals, reflected in the customer contracts

ESG Value Creation Levers* - Illustrative Example: Pet Food Company



KPIs impacted may include	
1	Revenue & cost
2	Customer acquisition and retention
3	Working capital
4	Lifetime value of customer (LTV)
5	EBITDA
6	Distribution costs (FTL/LTL, 3PL/Insourcing)
7	M&A metrics
8	Packaging efficiencies

*A subset of the levers are listed here. More may be identified and assessed as the team dives deeper into the company's business model.



Component D: Decarbonisation value creation

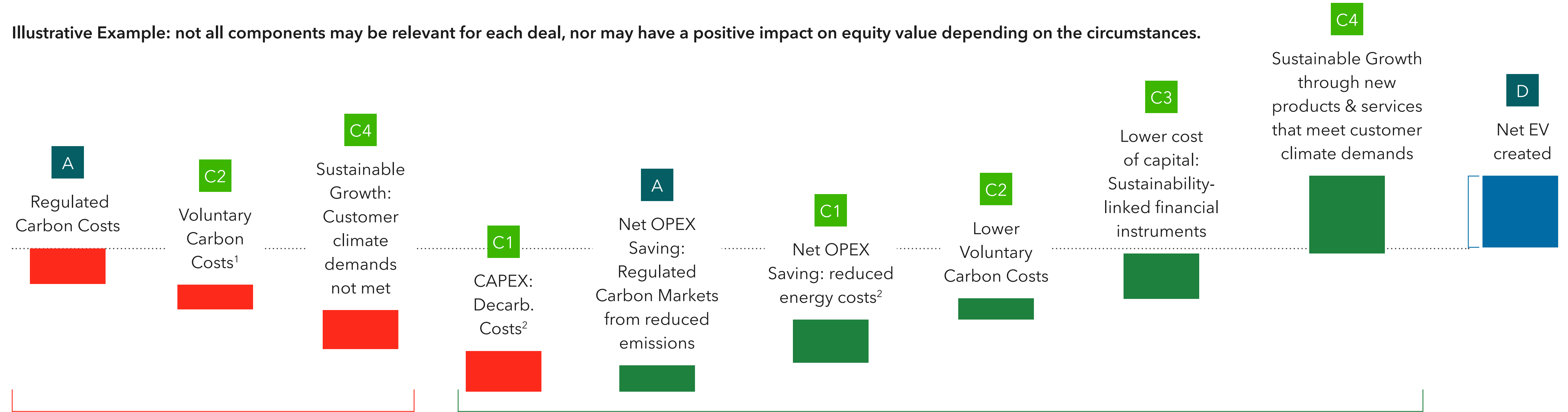
Sum of carbon impacts

Adjusting for decarbonisation value creation

D Decarbonisation value creation Reduction in regulated and internal carbon costs and increase in indirect carbon benefits from pursuing decarbonisation actions (e.g., adding solar to reduce footprint)

A + B + C impacts

Illustrative Example: not all components may be relevant for each deal, nor may have a positive impact on equity value depending on the circumstances.



Cost of carbon where no decarb action is undertaken

An investment in decarbonisation measures (C1) has potential knock-on effects for reduced net OPEX spend, lower cost of capital, and potential revenue generation



Component E: Carbon-adjusted multiple

Investors may consider whether to adjust the exit multiple, discount rate, or post-business plan growth when exit EBITDA does not reflect carbon-related future growth and earnings risk

When to adjust the carbon multiple?

E Carbon-adjusted multiple Self-imposed adjustment in valuation multiple at exit when exit EBITDA does not reflect carbon-related future growth and earnings risk (e.g., future carbon prices / decarbonisation strategy not reflected), based on self-assessed view of the specific context of a given business and its environment

Reasons to consider adjusting the multiple

Reason	Illustrative example	Impact on valuation	When multiple may be adjusted
Strength of governance impacts the ability of company to deliver against its carbon agenda	Weak management and inefficient capital allocation suggest that a value accretive decarbonisation plan will not be implemented	Quality of risk management can justify a lower discount rate	Exit EBITDA does not reflect future revenue growth and cost savings driven by decarbonisation
Assumed carbon costs are not fully capturing future carbon price outlook	Company is operating in industry and geography that is currently not regulated, is likely to face a carbon tax the next few years	Increased annual costs due to carbon tax reduce discount rate	Exit EBITDA does not reflect future carbon price increase and impact on future earnings
Assumed benefits are not fully capturing future differential relative to peer performance	Company has a robust decarbonisation strategy is likely to see stronger growth, driven by increased revenue and decreased costs	Increased annual revenue and decreased annual costs increase post-business plan growth	Exit EBITDA does not reflect future revenue growth and cost savings driven by decarbonisation
Current market multiples are not fully reflecting carbon impact	Company has the lowest carbon footprint and operates in an industry with many carbon-conscious customers	Increased annual revenue driven by carbon-conscious customers increase post-business plan growth	Exit EBITDA currently does not reflect stronger carbon positioning and potential impact on growth

Practical application



Discount Rate: Quality of risk management can justify a lower/higher discount rate in DCF analysis



Post-business plan growth: Governance practices can affect growth prospects post hold period, which can justify an upward/downward adjustment of the terminal growth rate



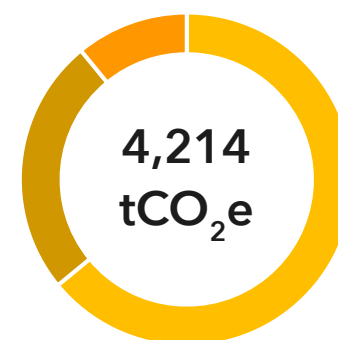
Exit Multiple: Current market valuation of companies with comparable governance structures and risk profiles can justify an adjustment to the exit EBITDA multiple

IC Memo template - Example

Component	Materiality
A Regulated carbon costs	✓
B Internal carbon costs	✗
C1 Decarbonisation costs/savings	✓
C2 Voluntary carbon costs	✓
C3 Sustainability-linked financial instruments	✗
C4 Sustainable Growth	✓

GHG Inventory 2023 (estimated)

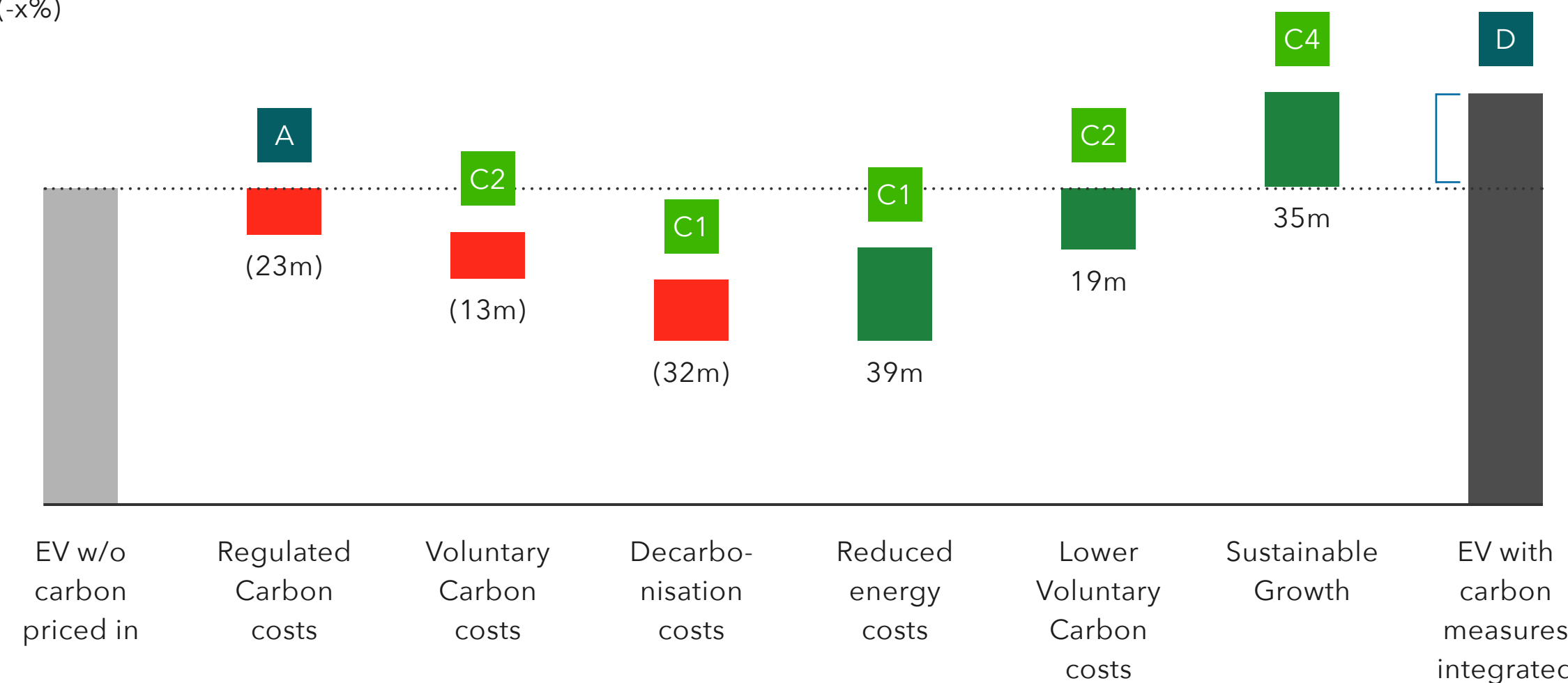
- Scope 1
- Scope 2
- Scope 3



- Value creation opportunities:**
- Decarbonisation measures reduce overall energy spend, fleet management
 - Decarbonisation measures reduce overall voluntary carbon credit spend
 - Increased market share from take-back schemes leading to sustainable growth
 - Risk as competitor B has invested heavily in developing less-carbon intensive product offering

Carbon valuation

Total Enterprise value Uplift: \$XX mm (-x%)



Current & Future State

Management Maturity:	Leading
Positioning vs Peers:	Lagging
Low Carbon Products & Services:	Existing
Sustainability Linked Debt:	Potential

Targets & Key Milestones

Year	Target/Milestone
2030	S1 & S2: 42% reduction
2030	S3: 56% reduction
2025	RE 100

Science Based Target: **Committed**

Decarbonisation Plan: **High Level - Not Costed**

Subject to Regulated Carbon: **\$0.8M**

Customer Requirements: **Yes**

Key Decarbonisation Initiatives

Action	Owner	tCO ₂ e reduction potential	% impact on total GHG inventory	Total CAPEX \$ to 2030	Incremental CAPEX \$	Incremental annual OPEX \$	Timeline to implement
Transition ICE vehicles to Hybrids	Fleet manager	1,350	32%	\$1,047,000	(\$156,000)	(\$779,000)	12 months
Onsite renewable generation	Procurement manager	545	13%	\$308,000	\$94,900	(\$403,000)	6 months



Appendix



Suggestions for proxy data sources to use in case of company data gaps for material topics

Valuation component	Proxy calculation	Proxy inputs	Proxy data source
Emissions estimation	<ul style="list-style-type: none"> • Sector tCO₂e average per \$ revenue* company revenue 	<ul style="list-style-type: none"> • Sector tCO₂e average per \$ revenue 	<ul style="list-style-type: none"> • CDP
<u>A: Regulated Carbon Costs</u>	<ul style="list-style-type: none"> • Not relevant (regulated carbon cost data is readily available) 	<ul style="list-style-type: none"> • Not relevant 	<ul style="list-style-type: none"> • Not relevant
<u>B: Internal Carbon Costs</u>	<ul style="list-style-type: none"> • Not relevant (if the company does not have an internal carbon price, it is not material) 	<ul style="list-style-type: none"> • Not relevant 	<ul style="list-style-type: none"> • Not relevant
<u>C1: Decarbonisation Costs / Savings</u>	<ul style="list-style-type: none"> • See page 26 for calculation approach 	<ul style="list-style-type: none"> • Sector tCO₂e average per \$ revenue • Value accretive emission reduction initiatives • Estimated WACC 	<ul style="list-style-type: none"> • CDP • IPCC Report • IEA Decarbonisation pathways • Calculated during FDD or estimated with Bloomberg / CapitalIQ data
<u>C2: Voluntary Carbon Costs</u>	<ul style="list-style-type: none"> • Not relevant (voluntary carbon cost data is readily available) 	<ul style="list-style-type: none"> • Estimates of current and future costs of carbon credits • Sector tCO₂e average 	<ul style="list-style-type: none"> • AlliedOffsets / Trove Research • Bloomberg • IEA WEO 2022 • CDP
<u>C3: Sustainability-linked Financial Instruments</u>	<ul style="list-style-type: none"> • Company size & geography • Loan maturity • Comparable corporate bond yields • Comparable corporate sustainability-linked / green bond yields 	<ul style="list-style-type: none"> • Estimated company size & geography • Loan maturity • Corporate bond proxy • Corporate sustainability-linked / green bond proxy 	<ul style="list-style-type: none"> • Confidential Information Memorandum (CIM) • Bloomberg • CapitalIQ • FactSet
<u>C4: Sustainable Growth</u>	<ul style="list-style-type: none"> • Not relevant (proxy calculation not possible) 	<ul style="list-style-type: none"> • Not relevant 	<ul style="list-style-type: none"> • Not relevant
Key outcomes	For material topics with insufficient company data, proxy data can be used in the analysis		

Developing assumptions on carbon costs to estimate emissions exposure calculation



All scope 1 and 2 emissions can be assumed to be a direct company cost. However, scope 3 emissions require estimates on the pass-through costs, which are determined by sector and geography

Guidance for developing pass-through assumptions

1. Pass-through costs are at the discretion of Deal Teams to decide what % of carbon-related costs can be passed through. Factors that may impact the chosen pass-through cost include deal-team risk appetite, sector, and geography.

2. Suggested pass-through:

- **Scope 1:** 0%, because the company has full control over its fuel usage
- **Scope 2:** 0%, because the company has full control over its procured electricity consumption
- **Scope 3:** 50%, because 50% of the carbon price is passed directly to consumer prices, as per [NGFS](#) guidance¹

3. Examples are provided below for how companies may outline their assumptions with sample approaches, ranging from conservative to optimistic

Conservative scenario Optimistic scenario

Chemicals manufacturing company		
Scope	% of carbon costs	Assumptions
Scope 1	100%	Company has full control over its fuel usage & utilities consumption
Scope 2	100%	
Scope 3	50%	Company assumes 50% of value chain costs can be passed through

Luxury Consumer Goods company		
Scope	% of carbon costs	Assumptions
Scope 1	0%	Inflationary market and luxury products' demand inelasticity means that customers are more willing to absorb the pass-through costs
Scope 2	0%	
Scope 3	25%	50% stays at the Company, 50% stays elsewhere in value chain

1) [NGFS Scenarios](#)



GPs may decide to apply a quantitative approach across an existing portfolio to determine materiality thresholds for pre-investment

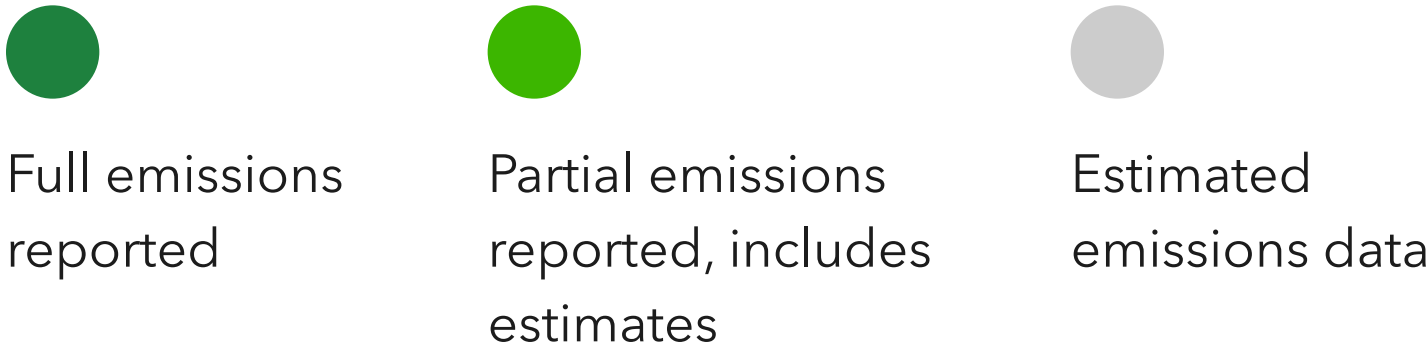
By assessing the existing portfolio, Deal Teams can determine their risk appetite and establish materiality thresholds using regulated/voluntary carbon costs as a proxy for potential carbon exposure in future DD processes

Step	Suggested action	Notes
1	<ul style="list-style-type: none"> Collect portfolio company data and determine carbon cash cost proxy 	<ul style="list-style-type: none"> Collect Sales and EBITDA data. Select most applicable regulated/voluntary carbon price as a proxy. See page 35 for data sources
2	<ul style="list-style-type: none"> Classify emission data quality (full/partial/estimated) 	<ul style="list-style-type: none"> Where there is no emissions data available for a PC, compile inventory or estimate emissions. See page 35 for estimation approach
3	<ul style="list-style-type: none"> Apply pass-through cost methodology across portfolio 	<ul style="list-style-type: none"> See page 36 for methodology
4	<ul style="list-style-type: none"> Calculate exposure rating and determine risk threshold 	<ul style="list-style-type: none"> The threshold is at the discretion of the Deal Team. Companies may want to use the median, 90th percentile, or another metric as a benchmark

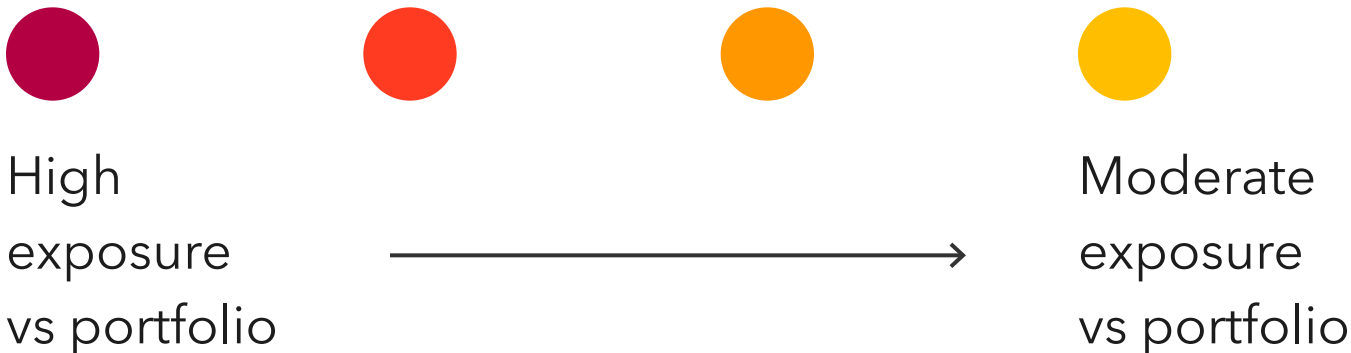
Example output: Ranked potential exposure across the portfolio (pre-VCP, carbon-adjusted metrics)

Carbon cash cost (mEUR)		As % of Sales		As % of EBITDA	
Company	Value	Company	Value	Company	Value
1	\$	1	%	1	%
2	\$	2	%	2	%
3	\$	3	%	3	%
4	\$	4	%	4	%
5	\$	5	%	5	%
6	\$	6	%	6	%
7	\$	7	%	7	%
8	\$	8	%	8	%
9	\$	9	%	9	%
10	\$	10	%	10	%

Key - Company data



Key - Exposure rating



Indicative view on identifying potential costs and associated savings

When developing proxy decarbonization strategies, it may be helpful to examine similar examples within the same sector, as companies with comparable profiles can serve as reliable benchmarks

Identifying relevant levers

- 1 Define climate impact**

Does the Target exist in 2050 in a low carbon economy? What adaptations are required for this scenario

- 2 Determine inventory**

Measure or estimate emissions. Emissions profiles within an industry are regularly comparable. Identify hotspots to tackle.

- 3 Identify decarbonisation actions**

 - 1. Efficiency measures: using/emitting less with same process
 - 2. Changing process: same result with different process
 - 3. Stopping process
 - 4. Carbon removals

- 4 Establish industry considerations**

If material, establish levers that are probable based on technology availability, regional access to technology, and business compatibility with technology or process changes

Calculating unit abatement cost: Example

Data on measure	Value	Units
Capital cost	100,000	\$
Energy savings	30,000	\$ per annum
Carbon saving	1,000	tCO ₂ e per annum
Lifetime	10	years
Discount rate	15.00%	per annum

NPV method											
Year	0	1	2	3	4	5	6	7	8	9	10
Cash flow	(100,000)	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Discounted cash flow	(100,000)	26,087	22,684	19,725	17,153	14,915	12,970	11,278	9,807	8,528	7,416
NPV	50,563										
tCO ₂ e		1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Excel NPV function	50,563										
Total tCO ₂ e saving	10,000										
Unit abatement cost	(5.06)	\$/tCO₂e									

- The NPV method looks at all cash flows (CAPEX and OPEX) over the project lifetime and discounts these back to today's value, allowing for expected price inflation. It is the same as a discounted cash flow (DCF) method
- This method is widely used in industry for assessing the costs/benefits of projects that save energy and carbon and have a finite plant lifetime
- **In this example, the carbon abatement cost is negative (positive NPV is a negative abatement cost; i.e. a saving)**
- The Marginal Abatement Cost in \$/tCO₂e is obtained by dividing the negative of the NPV of the project (in today's prices) by the total CO₂e abated by the project over its lifetime



Case Studies

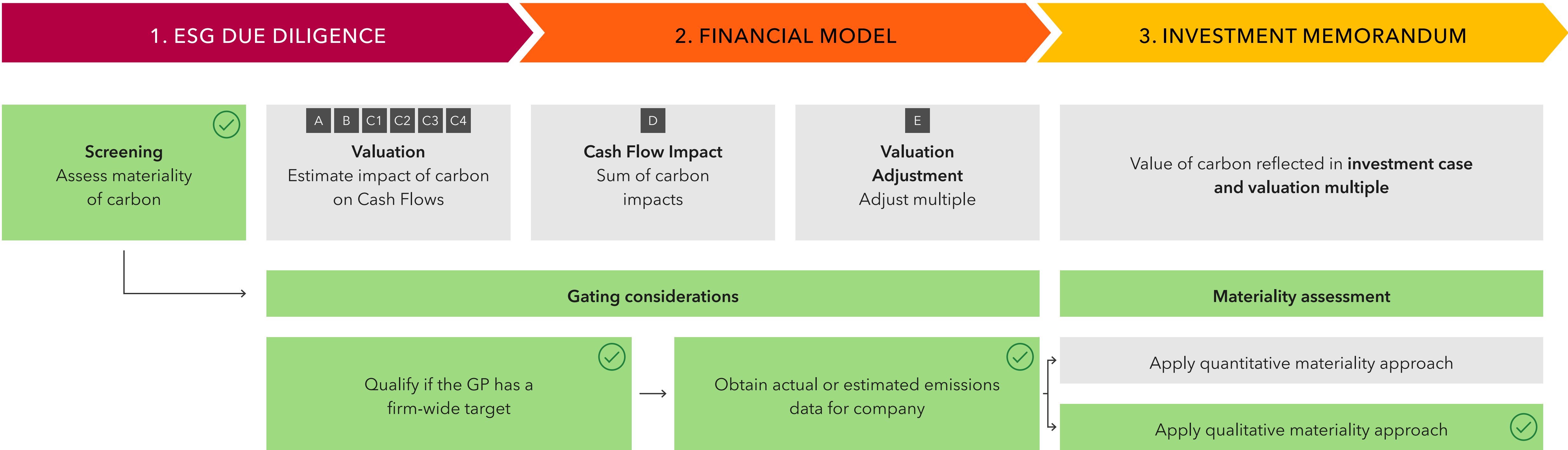


Case study: Business services business

Context

A global PE firm was evaluating the acquisition of a French home services business in 2024. As part of the due diligence process, the PE firm conducted standalone ESG DD with external advisors. The scope included screening for the materiality of carbon, using the PESMIT framework. Through a quick and easy process, carbon was deemed not material to the investment case and valuation. However, given the PE firm’s portfolio coverage SBT affecting all new acquisitions, the business will need to develop a decarbonisation plan post-acquisition.

Screening process



Legend
 ✓ Steps undertaken in ESG DD

Assessment

Valuation Component	Answer	Action required
0 Gating considerations	<ul style="list-style-type: none"> PE firm has SBTi-validated portfolio-coverage decarbonisation target. Target would be in scope of SBT. Target has a 2021 GHG baseline for Scopes 1 and 2. 	Determine impact of acquiring Target on PE firm's SBT achievement and assess materiality of valuation components.
A Regulated carbon markets	<ul style="list-style-type: none"> Target's sector is not covered by regulatory mechanisms (e.g. EU ETS or CBAM) or anticipated to be so in the future. 	<p><i>Not material for DD. No further action required.</i></p>
B Internal carbon price	<ul style="list-style-type: none"> Company has not implemented an internal carbon price mechanism and does not plan to (nor PE firm). 	
C1 Decarbonisation costs / saving	<ul style="list-style-type: none"> Not a high-/mid-emitting sector Not a complex supply chain. Target has no decarb targets or plan currently in place. However, as Target operates in a low-risk sector and is not a significant energy user, decarbonisation cost is likely to be immaterial. 	
C2 Voluntary carbon costs	<ul style="list-style-type: none"> Does not currently purchase carbon credits and no commitments to do so. 	
C3 Sustainability-linked financial instruments	<ul style="list-style-type: none"> Target is out of scope of the PE firm's SLL requirements. 	
C4 Sustainable growth	<ul style="list-style-type: none"> No opportunities identified. 	

Key takeaways

1

Carbon is deemed not material

No further DD/investigation needed, and carbon not priced into investment case or valuation multiple.

2

However, Target will need to set SBTs in line with PE firm's SBT

To align with PE firm's portfolio-coverage SBT, Target will need to set SBTi-validated decarbonisation targets and develop a fully costed, board approved decarbonisation plan.

3

Therefore some minor costs included in business plan

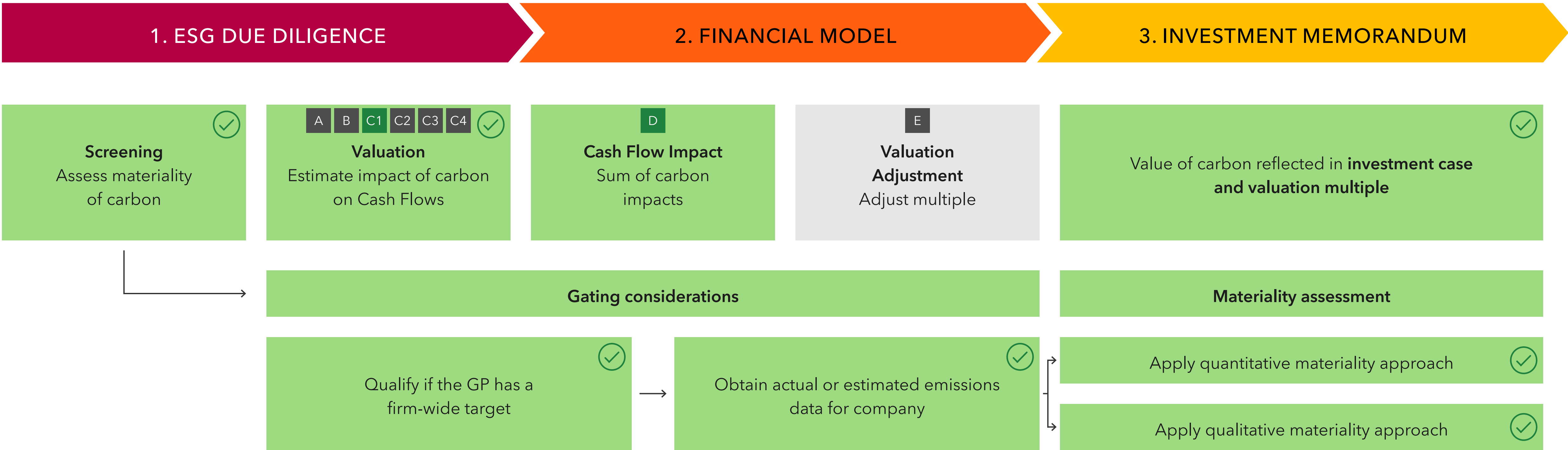
Costs factored in for carbon footprinting software and work to develop decarbonisation targets and plan post-acquisition (not including cost to implement plan), priced at ~ EUR200k.

Case study: Food and beverage business

Context

A global PE firm was evaluating a European food and beverages business in 2024. As part of the due diligence process, the PE firm conducted standalone ESG DD with external advisors. The scope included screening for the materiality of carbon, and assessing the impact of carbon on the business which ultimately fed into cash flows, using the PESMIT framework. The most material component of the PESMIT framework was “decarbonisation costs” of reducing the emissions associated with the ingredients from a key product line.

Screening process



Legend
 ✓ Steps undertaken in ESG DD

Assessment

Valuation Component		Answer	Suggested action
0	Gating considerations	<ul style="list-style-type: none"> Target would be in scope of PE firm's portfolio coverage Science Based Target (SBT) Target has a 2019 GHG baseline for Scopes 1 and 2, and 2023 baseline for Scope 3. 	Set Scope 3 SBT for Target (Scope 1 and 2 already in place) and develop decarb plan post-acquisition.
A	Regulated carbon markets	<ul style="list-style-type: none"> Target is not directly exposed to EU ETS or CBAM or anticipated to be so in the future. Potential indirect exposure via sourcing of aluminum and energy. 	Not material for DD. No further suggested action.
B	Internal carbon price	<ul style="list-style-type: none"> N/A for Target or PE firm. 	
C1	Decarbonisation costs / saving	<ul style="list-style-type: none"> Medium-emitting sector (consumer goods). Majority of emissions in Scope 3 (ingredients). Target has SBTi-validated targets for Scopes 1 and 2. Decarbonisation of Scope 3 expected to require material investments (mainly OPEX), not accounted for in current mgmt. plan). 	No quantified decarb plan for Target in place: ESG DD included high-level review of potential emission reduction initiatives.
C2	Voluntary carbon costs	<ul style="list-style-type: none"> Does not currently purchase carbon credits and no commitments to do so. 	Not material for DD. No further suggested action.
C3	Sustainability-linked financial instruments	<ul style="list-style-type: none"> Target is out of scope of the PE firm's SLL requirements. 	
C4	Sustainable growth	<ul style="list-style-type: none"> No opportunities identified. 	

Key takeaways

- Carbon is material due to decarb costs**
 Scope 3 decarbonisation investments expected to be material (mainly OPEX; ~3% increase in ingredients costs across certain products).
 - Cost of Scope 3 decarbonisation was accounted for in investment case**
 Estimated costs factored into cash flow/COGS buffer.
 - Target will need to set Scope 3 target in line with PE firm's SBT**
 To retain an SBTi-validated target and remain aligned with PE firm's portfolio SBT, Target will need to set a Scope 3 target and develop decarbonisation plan.
- **High-level review of potential S3 reduction initiatives**
 - Ingredients identified as S3 emissions hotspot (~73%).
 - Bottom-up estimate suggested ~3% cost increase for decarbonising highest-emissions ingredient
 - Other S3 decarb levers identified and costed, incl. some with expected positive ROI.

Disclaimer

This paper is meant to serve as a resource for private equity firms at all stages of their carbon valuation journey, and to facilitate conversation and learning. It provides information that may be useful in the process of developing and implementing a firm's own approach to carbon valuation. This paper is not intended to convey mandatory guidance or be construed as a framework against which to measure firms' policies or programs.

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