Transition finance for hard-to-abate sectors in Vietnam

A practical guide

Climate Bonds INITIATIVE

Prepared by Climate Bonds Initiative

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Climate Bonds Initiative

Climate Bonds is an international organisation working to mobilise global capital for climate action. It promotes investment in projects and assets needed for a rapid transition to a low-carbon, climate-resilient, and fair economy. The mission focus is to help drive down the cost of capital for large-scale climate and infrastructure projects and support governments seeking increased capital markets investment to meet climate and greenhouse gas (GHG) emission reduction goals. Climate Bonds conducts market analysis and policy research; undertakes market development activities; advises governments and regulators; and administers a global green bond Standard and Certification scheme.

Climate Bonds screens green finance instruments against its global Taxonomy to determine alignment, and shares information about the composition of this market with partners. The Climate Bonds team has also expanded its analysis to other thematic areas, such as social and sustainability bonds via the development of screening methodologies for investments that give rise to positive social impacts and added resilience. This scheme is underpinned by rigorous scientific Criteria to ensure that Certified bonds and issuers are consistent with the well-below 2˚C target of the Paris Agreement. Obtaining and maintaining Certification requires initial and ongoing third-party verification to ensure the assets meet the metrics of sector Criteria.

Report summary

Confronted with escalating climate risks and the global push toward a net-zero economy, businesses operating in hard-to-abate sectors must undertake ambitious and credible transition journeys. Transition finance for hard-to-abate sectors in Vietnam provides a strategic resource to guide corporates, investors, and policymakers through this complex process. This guide aims to bridge the gap between climate ambitions and practical actions, focusing on high-emission sectors such as steel, cement, and basic chemicals. It aligns with global frameworks such as the Paris Agreement and Climate Bonds screening methodologies, offering clear guidance on developing credible, science-based transition plans.

This guide serves as a manual for diverse stakeholders. For corporates, it offers a structured approach to developing transition plans that integrate sustainability into core business strategies while enhancing competitiveness. Investors and financial institutions can leverage the guide's detailed framework for assessing corporate transition plans, identifying credible investment opportunities, managing climate-related risks, and designing innovative financial products to support impactful decarbonisation projects. Policymakers can use its insights to create effective regulatory frameworks that accelerate Vietnam's transition to a low-carbon economy.

Contents

The guide is organised into clear and actionable sections that include the following topics:

Understanding transition planning establishes the fundamentals of a credible transition plan, focusing on setting clear, science-aligned targets, developing measurable strategies, and ensuring accountability through transparent reporting.

The Five Hallmarks of a successful transition plan offers a detailed, step-by-step guide on how to set performance targets, develop comprehensive action plans, build effective governance frameworks, and maintain transparency through external reporting.

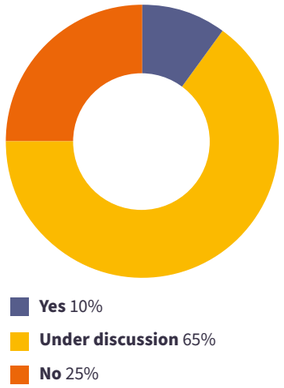
Sectoral pathways and Paris-aligned strategies delivers tailored insights for critical industries including steel, cement, and basic chemicals. It provides sector-specific decarbonisation strategies and practical measures to achieve meaningful emissions reductions, ensuring alignment with the Paris Agreement.

Corporate transition assessment introduces a structured methodology to evaluate the maturity, ambition, and credibility of corporate transition plans. This section helps financial institutions and investors align their capital allocation strategies with companies demonstrating genuine progress toward decarbonisation.

Financing the transition explores financial instruments such as sustainability-linked bonds (SLBs), and sustainability-linked loans (SLLs) that can support businesses in executing their transition strategies. It emphasises aligning financing with credible transition plans to attract sustainable investments and reduce the cost of capital.

The transition to a sustainable future is not just a strategic priority but a business imperative. By providing clear, actionable insights and proven methodologies, this guide empowers stakeholders to move from ambition to action, transforming Vietnam's high-emission sectors into resilient and forward-thinking industries aligned with global climate goals.

Figure 1 **G20 legislation on transition plans or their disclosure**[1]



Introduction

- **What is a transition plan and why is it important for corporates to have one?**
- **How to get started?**

A transition plan is a critical component of an organisation's broader business strategy, outlining its concrete targets and actions to decarbonise. It describes how the organisation will reduce greenhouse gas (GHG) emissions and adapt business models to align with sustainability goals.

The concept gained prominence following the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C above pre-industrial levels, which underscored the need for GHG emissions to decline by 45% by 2030 and achieve net-zero by 2050 to meet the 1.5°C target. The report highlighted the severe consequences of surpassing this threshold, driving global urgency for robust and actionable climate strategies.

Transition plans are roadmaps of credible, Paris Agreement-aligned decarbonisation strategies. They enable investors to identify and allocate resources toward investments that meaningfully contribute to the global net-zero transition. Developing, monitoring, and periodically updating these plans is vital to maintaining credibility.

Legislation mandating transition planning or its disclosure has been adopted or is under consideration in fifteen G20 countries. Frameworks such as the EU Corporate Sustainability Reporting Directive (CSRD) and the U.S. SEC's proposed climate disclosure rules exemplify the growing focus on transparent reporting of climate risks, emissions, and decarbonisation strategies. Similar regulations are expected to emerge in developing markets, emphasising the global necessity of corporate climate transition planning.

For organisations, transition plans are not just compliance tools; they communicate action plans and are essential for maintaining competitiveness and long-term viability in an evolving market. Failure to adapt can result in regulatory penalties, reputational risks, and diminished access to capital, as investors increasingly prioritise businesses aligned with sustainability objectives. Investors scrutinise these plans to assess the credibility of corporate commitments, understand how businesses will mitigate risks, and capitalise on opportunities in a low-carbon economy.

Preparing to develop a transition plan

A transition plan starts with an audit of an entity's carbon footprint, which identifies and quantifies emissions across all scopes:

Scope 1 direct emissions from owned or controlled sources.
Scope 2 indirect emissions from purchased energy.
Scope 3 all other indirect emissions, including those across the value chain.

By mapping out the sources of emissions throughout its supply chain and operational processes, an entity can establish a baseline emissions profile. This baseline serves as the foundation for measuring progress and setting actionable goals.

With a clear picture of its baseline emissions, the management team can define its long-term objectives, particularly for 2050, in alignment with global net-zero targets. This requires a strategic evaluation of the entity's current resources, regulatory obligations, and anticipated changes in future policy landscapes. Setting realistic yet ambitious targets involves balancing the organisation's operational capabilities with evolving sustainability demands, ensuring compliance and its positioning as a forward-thinking entity within its industry.

A transition plan outlines the step-by-step strategies and actions necessary to move from the current state to the envisioned future, whether that means achieving net-zero emissions by 2050 or any interim goals along the way. By establishing clear pathways, milestones, and mechanisms for monitoring progress, the transition plan becomes a critical tool for navigating and measuring progress during the complex journey toward a sustainable and resilient business model.

1 Underlying principles for a transition plan

What makes a transition plan truly credible and science-aligned?

How can companies ensure transparency and accountability in their decarbonisation efforts?

Climate Bonds highlights five principles of a credible transition plan. By adhering to these principles, organisations can build stakeholder confidence, attract sustainable investments, and contribute effectively to the global net-zero agenda.

1.1 Five transition principles underpinning an ambitious transition

Five transition principles are summarised in Table 1 below and serves as the anchor for the 'Three A' transition framework and the 5 Hallmarks that will be discussed in the following sections.

The principles establish the core characteristics of credible transition pathways, emphasising the need for present action and long-term commitment. A credible transition goes beyond promises for future alignment; it requires entities to actively follow scientifically validated pathways aligned with the 1.5°C global warming target. These pathways are developed by experts, focusing on technological feasibility rather than economic convenience and prioritising direct emissions reductions over reliance on offsets. In the face of the urgent climate crisis, only swift and ambitious transitions can achieve meaningful progress.

Table 1 **Summary of the Transition Principles for activity- and entity- level transitions** [2]

Principle	Details
Principle 1 Credible transition goals and pathways align with 1.5°C global warming limits.	• Transition goals and pathways need to align with global targets for net-zero emissions by 2050 and a near halving of emissions by 2030. • Compatibility with nationally determined contributions (NDCs) (or strategies aligned with them) is not automatically sufficient. • Neither are the pathways that are exclusively defined in terms of best-in-class benchmarks (such as best available technologies) are not sufficient.
Principle 2 Credible transition goals and pathways are established by the climate science community and are not entity specific.	• The expertise of the climate science community and technical experts is needed to navigate the complexity of allocating global GHG budgets between industries and economic activities. • Using the science as a common base for commonly applied transition pathways maximises the chance of global emissions reductions reaching the scale needed to limit global warming to the agreed targets and ensures comparability between transitioning activities and entities in the same industry.
Principle 3 Credible transition goals and pathways do not count offsets, but should count upstream scope 3 emissions.	• Pathways should not account for emissions reductions generated through separate activities, including purchased offsets, but should address scope 1 and 2, and upstream scope 3 emissions as far as this is practically possible.
Principle 4 Credible transition goals and pathways take into account technological viability, but not economic competitiveness.	• Development of transition pathways must include assessment of current and expected technologies. Where a viable technology exists, even if relatively expensive compared to business-as-usual technology, it should be used to determine the appropriate decarbonisation pathway for that economic activity.
Principle 5 Credible transition means actually following the transition pathway; pledges, policies and strategies alone are not sufficient.	• Actual operating metrics are the key indicators of performance, not simply pledges or the implementation of policies and procedures that may or may not deliver operational outcomes. • Activities/entities must be able to credibly demonstrate how they will follow the transition pathway over the financing term, and regular assessment is required to demonstrate that transition is continuing at the necessary scale and pace. • In some situations, this will require activity/entity level decarbonisation plans and targets matched to the financing term.

2 Components of a credible transition plan and the 5 Hallmarks

Key elements of a transition plan (The 5 Hallmarks)

Deep dive into each component

A credible transition plan ensures that sustainability efforts are not just theoretical aspirations but actionable, measurable, and transparent strategies. For investors, such plans signal reliability, accountability, and an entity's preparedness to adapt to low-carbon business models.

The Taskforce on Climate-Related Financial Disclosures (TCFD) highlights four key elements in a transition plan.[3]

1. Governance covers the role of the board and senior management in overseeing and executing the transition plan. This includes approving climate-related targets, ensuring accountability through clear roles and responsibilities, aligning incentives with climate goals, and maintaining transparency with stakeholders.

2. Strategy covers the alignment of the transition plan with the organisation's broader business strategy. It includes defining specific activities, setting time-bound targets, and aligning with global temperature goals (e.g., 1.5°C). Additionally, it addresses prioritised opportunities, action plans, financial planning, and scenario analysis, while considering uncertainties and challenges related to implementation.

3. Risk management covers the identification and mitigation of risks associated with the transition to a low-carbon economy. This includes recognising challenges and uncertainties that could hinder progress and developing strategies to address them effectively.

4. Metrics and targets cover the measurable indicators that track progress toward achieving climate goals. These include quantitative and qualitative performance metrics, detailed GHG emissions reduction targets, timelines, and methodologies that align with industry standards.

In this guide, the Climate Bonds Initiative (Climate Bonds) methodology is adopted to streamline the process of developing credible transition plans. This approach integrates elements from globally recognised frameworks, such as TCFD guidance, and presents them in a simpler, hierarchical structure. By breaking down the key elements of a transition plan into five easy-to-understand hallmarks, this methodology offers practical support to organisations.

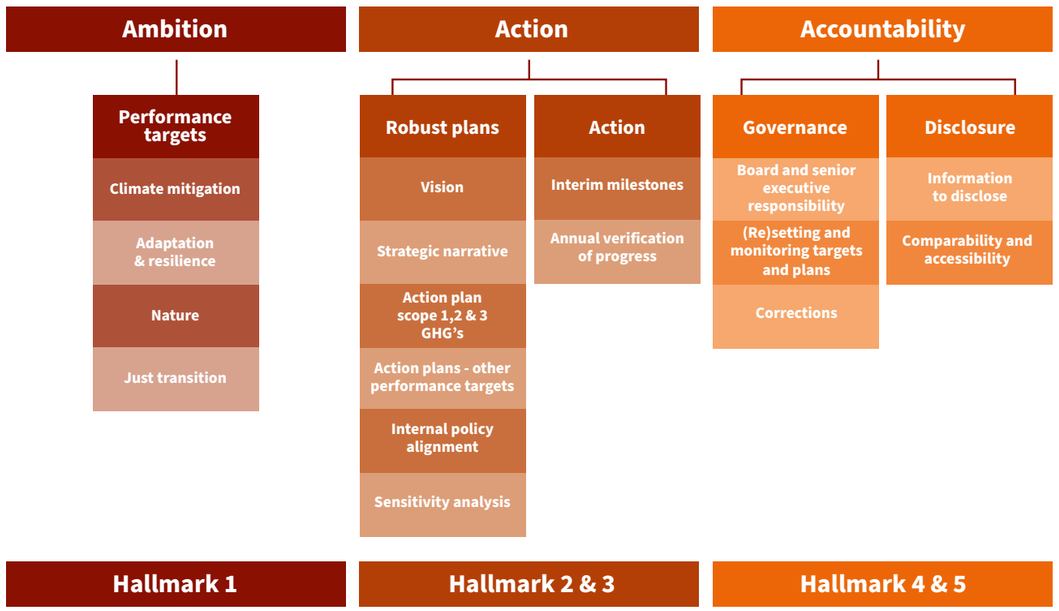
The five hallmarks are structured sequentially to drive performance and ensure credibility.

1. Paris-aligned targets
2. Robust plans
3. Implementation action
4. Internal monitoring
5. External reporting

Each hallmark builds upon the previous one, promoting alignment with scientific standards, measurable progress, and transparency. These hallmarks ensure that transition plans:

- Align with scientific climate frameworks, such as the Paris Agreement.
- Are practical and testable over realistic timelines.
- Remain simple yet focused on critical metrics, avoiding unnecessary complexity.
- Draw on existing frameworks, fostering comparability and consistency across industries.

Figure 2 **Triple A transition plan framework and 5 Hallmarks**[4]



2.1 Hallmark 1: Performance targets

Step 1: Select a common sectoral decarbonisation pathway
Step 2: Select company-specific metrics and performance targets
Keep in mind to address all material emissions while setting the targets

The Five Transition Principles discussed in Section 1 are the foundational blocks for Hallmark 1. The three key elements that collectively form the Hallmark 1 are as follows:

2.1.1 Step 1: Selection of a common sectoral decarbonisation pathway

The first key element of Paris-aligned targets is the selection of a common sectoral decarbonisation pathway. Such pathways outline how industries align with the Paris Agreement's goal to limit global warming to well below 2°C, ideally 1.5°C, and identify the levers that are available to achieve it. Rather than reflecting sector averages or best-in-class efforts, they emphasise forward-looking, absolute targets that are technologically feasible and ensure alignment with a net-zero economy by 2050.

A common pathway provides a standardised framework across industries, enabling consistency and comparability between companies. This ensures that companies do not define bespoke pathways, which can lead to inefficiencies, undermine collective climate efforts, and complicate investors' assessments of progress. Instead, businesses are encouraged to follow internationally recognised sources such as the **Transition Pathway Initiative, Science-Based Targets Initiative (SBTi), and Climate Bonds Taxonomy.**

There may be an opportunity for flexibility, particularly in the early stages of transition. Higher emissions in some parts of the economy or sector may be compensated for by reductions elsewhere. However, this flexibility reduces as the overall proportion of carbon-neutral or near-zero carbon activities increases towards 100%. It is important to note that NDCs may not automatically align with a 1.5°C pathway, requiring companies to rely on science-based transition frameworks to ensure their strategies remain credible.

The table below provides the status of sector transition pathways from different internationally recognised sources.

Table 2 **Status of sector transition pathways by different organisations**[5]

	Climate Bonds*	SBTi	TPI	ACT
Basic chemicals	✓	P	O	✓
Cement	✓	✓	✓	✓
Iron and steel	✓	✓	✓	✓

O On plan/not yet started P In progress ✓ Concluded;
**Criteria development utilise sector pathways developed by peers*

Targets are a cornerstone of a credible transition plan, defining how an entity will align with, or even exceed, the sectoral decarbonisation pathway

2.1.2 Step 2: Selecting a set of entity-specific metrics and targets (performance targets)

When relevant green sectoral pathways have been identified as benchmarks, entity-specific performance targets should be chosen. These targets are a cornerstone of a credible transition plan, defining how an entity will align with, or even exceed, the sectoral decarbonisation pathway. Given that companies begin their transition journeys from varying starting points, performance targets are essential for outlining the trajectory and timing of their alignment with the selected pathway.

Key performance indicators (KPIs) are quantifiable metrics that organisations use to measure their performance against specific sustainability objectives. In transition plans, KPIs are carefully chosen to ensure alignment with the issuer's overall business strategy and address significant sustainability challenges. These indicators must be relevant, measurable, and material to the entity's operations, enabling consistent tracking and external verification of progress toward transition objectives. Most material themes in industrial sectors are provided in Table 3 below.

In contrast, sustainability performance targets (SPTs) define the specific, time-bound goals an organisation commits to achieving. Directly linked to the KPIs, SPTs represent the ambition and commitment to surpass business-as-usual performance levels. They provide a roadmap for transitioning to a more sustainable trajectory, with clearly defined timelines and alignment with industry standards or global benchmarks.

The relationship between KPIs and SPTs is foundational in transition planning. KPIs serve as the baseline metrics, while SPTs translate these metrics into actionable targets, defining what success looks like. Together, they form a framework for accountability, enabling stakeholders to evaluate an organisation's progress toward its transition goals. This dynamic is further reinforced in mechanisms such as sustainability-linked bonds (SLBs), where achieving SPTs often results in financial incentives, while failure to meet targets may lead to penalties.

Performance targets should encompass three key horizons to ensure a comprehensive transition trajectory.

- **Short-term (3 years):** detailed, actionable plans with high certainty of execution are required.
- **Medium-term (to 2030):** targets should aim to halve emissions by 2030, consistent with global climate goals, while allowing for adaptive flexibility.
- **Long-term (2030–2050):** Long-term (2030–2050): broad strategies to align with net-zero targets by mid-century should be outlined, ensuring there are no gaps between medium- and long-term plans.

Performance targets may be expressed in either a GHG metric and/or another proxy indicator

Performance targets are milestones to measure progress. Interim targets encourage companies to adjust strategies as needed to meet evolving climate demands. In this way, each milestone investment contributes to the broader decarbonisation trajectory, linking operational and capital decisions to climate goals. These targets not only ensure companies stay on track but also enhance investor trust by demonstrating that the transition is both achievable and actionable over the long run.

Performance targets may be expressed in either a GHG metric and/or another proxy indicator. GHG is a simple and well understood metric that enables straightforward comparability across companies in a sector, which enables a rapid assessment of whether the entity's transition is aligned with the targets for the sector, and therefore sufficiently rapid and robust. However, there may be other proxy indicators which are also of merit. For example, a food processor might select metrics and KPIs relating to the percentage of commodity purchases from farms or supply chains certified as being under climate-smart farming methods. An entity switching from coal to renewable-energy generation might select a KPI relating to the percentage of coal-fired generation that will be decommissioned by a specified date. Where non-GHG KPIs are used, the impact in terms of GHG emissions and **how and for how long it delivers alignment with decarbonisation pathway for that sector should be clearly described.**

An entity might select a performance target expressed in terms of GHG reductions compared to business as usual. Indeed, such metrics are often attractive to investors who seek some form of 'additionality' or measurable impact arising from their investment. However, as noted above, credible transition means aligning with forward looking sectoral green transition pathways, common to all those in the sector, that account for future carbon budgets at a global collective level.

Establishing entity-specific performance targets solely as reductions relative to the entity's own business-as-usual (BAU) scenario limits comparability. Such targets should be recalibrated to demonstrate alignment with forward-looking transition pathways specific to the sector. The measure of success must not be how large or small an entity's change is relative to its own performance, but whether the result will be compatible with the collective emissions reductions targets needed.[6]

Table 3 **Most material themes in industrials and manufacturing sector**[7]

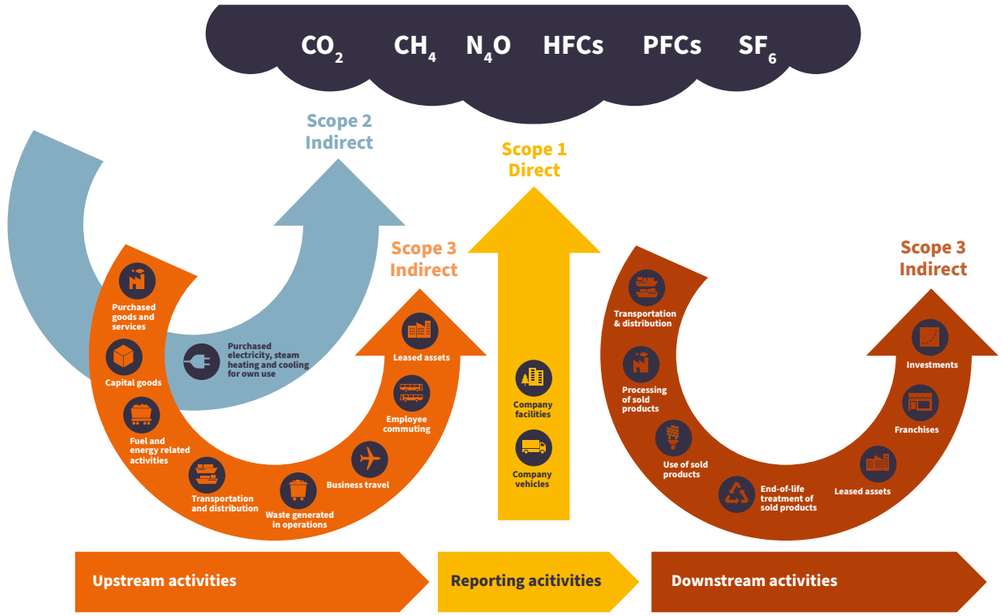
	Sustainability themes	Industrials & Manufacturing
Environment	Climate change (GHG emissions and energy)	■
	Air quality	■
	Water (incl. ocean)	■
	Waste	●
	Raw material sourcing and recycling (circular economy)	■
	Biodiversity (incl. soil/land use)	
Social	Access & affordability	
	Community inclusion & involvement (incl. human rights)	
	Occupational health & safety	■
	Diversity	●
	Working conditions (employee engagement, labour practices, and labour rights)	●
Governance	Value chain	■
	Business ethics	
	Data protection & security (incl. cybersecurity)	
	Consumers (incl. relation and welfare, responsible marketing, and product labelling)	
	Product governance (safety and quality)	●

■ Most Material ● Material

2.1.3 Address all material emissions

While setting the performance targets and associated KPIs, the entity should account for all material emissions across scope 1, 2, and 3 to avoid greenwashing concerns and ensure comprehensive decarbonisation. Incomplete accounting, where certain emissions sources are omitted, undermines investor trust and suggests that an entity may be focusing only on easily attainable reductions or 'low-hanging fruit'.

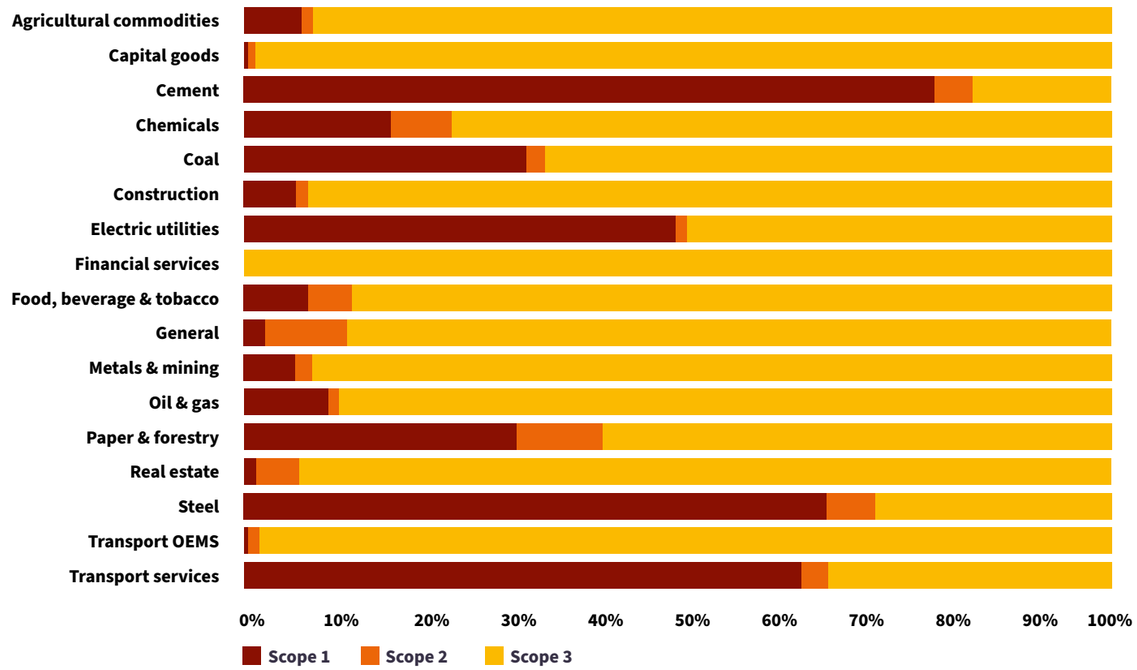
Figure 3 **Overview of GHG protocol scopes and emissions across the value chain**[8]



Source: Greenhouse Gas Protocol

Addressing all material emissions ensures that transition efforts are not fragmented or superficial, reinforcing the entity's long-term commitment to sustainable practices.

Figure 4 **Source 1, 2 and 3 emissions by sector**[9]



2.2 Hallmark 2: Robust plans

Step 3: Establishing detailed decarbonisation plan
Step 4: Planning the financial investments required to achieve the transition plan
Step 5: Establish a governance mechanism to oversee the transition plan
Step 6: Board approval

A robust transition plan is essential for achieving the performance targets outlined under Hallmark 1. This plan bridges the gap between the entity's current position and its future goals, providing a detailed roadmap with clear strategies, financing, and governance mechanisms. It offers investors confidence that commitments are actionable, measurable, and aligned with long-term sustainability.

2.2.1 Step 3: Establishing the transition strategy and action plan

A transition plan must describe **how the entity will achieve its performance targets** over short-, medium-, and long-term milestones. The strategy should provide a qualitative, step-by-step outline of changes needed, broken down into **3–5-year intervals** and include the following elements:

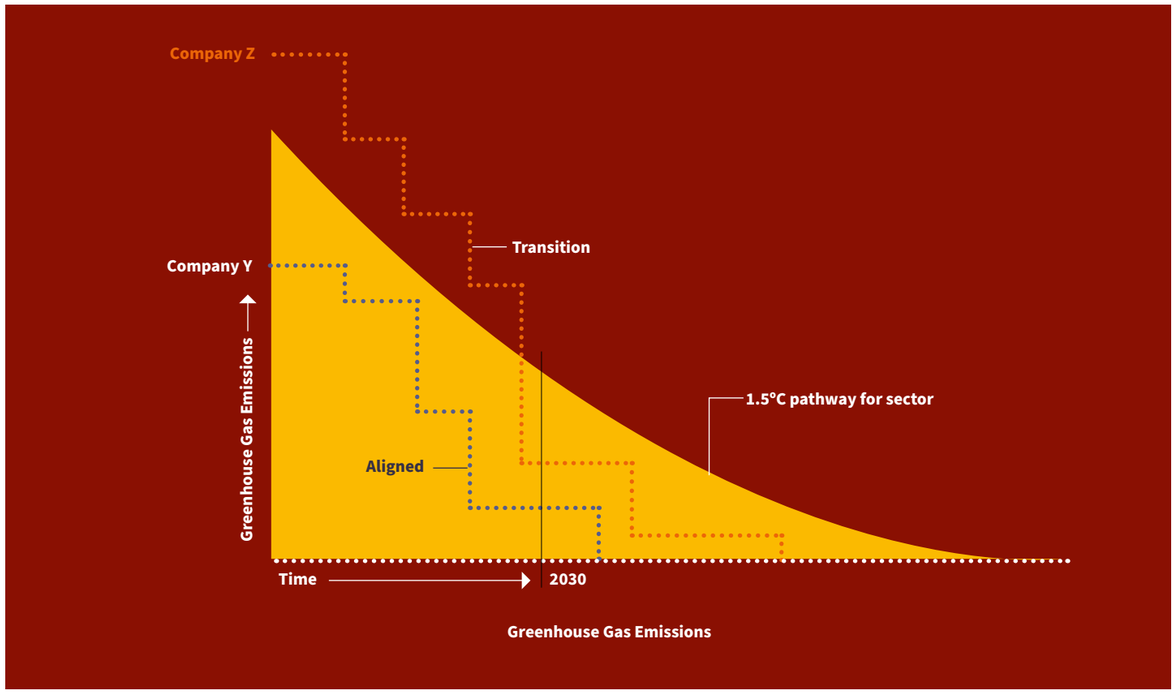
- **Current position.** As described earlier, this is a prerequisite for any entity starting their transition journey. The entity must assess where it currently stands on its decarbonisation journey, identifying emissions sources, opportunities, and risks.
- **Nature of changes,** which can involve:
  - **Decarbonising operations** through technological upgrades or efficiency improvements. (The next section will highlight the projects or measures that companies in steel, cement, and basic chemicals can undertake to decarbonise their operations.)
  - **Diversifying products and services** to include greener options.
  - **Ending activities** that cannot align with net-zero goals through decommissioning.
  - **Addressing supply chain emissions** upstream and downstream through sourcing policies.

Where solutions are unclear, the entity should **outline R&D activities** aimed at finding viable pathways.

- A well-defined action plan can include multiple **sub-plans**, such as:
  - **Technical plans** to enhance product performance.
  - **HR plans** for workforce reskilling.
  - **Supplier engagement strategies** through purchasing plans.
  - **Marketing plans** to engage customers in the entity's transition.
  - **PR strategies** for policy engagement and transparency.

To maintain credibility, the plan should also **identify risks** to delivery and provide mitigation measures, ensuring adaptability to unforeseen challenges.

Figure 5 **Example emissions pathway and company alignment**[10]



2.2.2 Step 4: Developing a financing plan

Once all the plans are put in place it is essential to bind them to a well-orchestrated financing plan that serves as a **tangible indicator of the entity's intent and capability** to implement the transition strategy. It must address the financial needs associated with capital expenditures (capex), operating expenses (opex), mergers and acquisitions (M&A), and R&D investments.

The financing plan should:

- **Align capital allocation** with performance targets to ensure that resources support the transition.
- Detail **how expenditures will be tracked** and aligned with KPIs.
- **Disclose the share of aligned capex** and identify the year when investments in carbon-intensive assets will peak.
- Include provisions for **retraining staff**, decommissioning, or repositioning business activities to meet sustainability goals.

2.2.3 Step 5: Implementing governance mechanisms

Governance structures must ensure that the **transition strategy is integrated into everyday operations** and leadership decisions. For companies making incremental changes such as **upgrading engines to take a new fuel source**, existing governance frameworks may suffice. However, for companies undergoing fundamental shifts, such as transitioning from coal-based energy to renewables, **enhanced governance mechanisms** are needed to mitigate risks and ensure progress.

These mechanisms include:

- **Board oversight** of climate-related risks and opportunities.
- **Climate competencies at the board level** to provide effective leadership.
- Governance structures that **monitor and recalibrate transition strategies** over time, especially in response to economic or technological shifts.

For complex transitions, **long-term oversight is essential** to sustain momentum across personnel changes or shifting priorities.

2.2.4 Step 6: Board-level approval

To solidify the plan's commitment, the board of directors must formally sign off on the selected performance targets, strategies, and financing plans. This ensures that the transition is embedded at the highest level of corporate governance and aligns with the entity's long-term vision.

By the end of Step 6, the transition plan should be fully developed and theoretically ready for implementation. It will encompass well-defined performance targets, a robust decarbonisation strategy, a clear financing plan, and strong governance mechanisms, all formally approved at the board level. With these foundational elements in place, the focus shifts from planning to execution. The next three hallmarks, Implementation Action, Internal Monitoring, and External Reporting, are not standalone steps in creating the transition plan but rather ongoing processes that ensure its successful execution and continuous alignment with evolving climate goals. These hallmarks provide a practical framework for managing the transition, tracking progress, and maintaining transparency, enabling the company and its transition management team to navigate the complexities of making the plan operational effectively.

2.3 Hallmark 3: Implementation action

2.3.1 Step 7: Implementation Action

- **How can companies show progress toward decarbonisation goals?**
- **What actions ensure effective implementation of a transition plan?**

Hallmark 3 ensures that the **plans and targets defined under Hallmarks 1 and 2** are actively being executed. It focuses on **demonstrating tangible progress** by tracking interim milestones, identifying gaps, and implementing corrective measures when needed.

Key elements of implementation include:

1. **Delivery of interim milestones.** The entity should actively meet the milestones set within its transition strategy and financial plans, showing early progress toward decarbonisation goals.

2. **Corrective actions for missed targets.** When interim metrics are missed, companies must provide transparent explanations and outline corrective actions.

Given that building new infrastructure, retraining staff, and changing supplier relationships can take time, interim indicators are essential to assess progress. These can include the following:

- **Rolling out capex and opex plans** to reflect strategic investments.
- **Decommissioning activities** no longer aligned with net-zero goals.
- **Engagement with suppliers** to reduce emissions throughout the supply chain.
- **Training senior executives and board members** to align leadership with climate goals.

2.4 Hallmark 4: Internal monitoring

2.4.1 Step 8: Internal monitoring

• Monitoring the implementation of the transition

Hallmark 4 emphasises the **internal governance and oversight systems** needed to ensure the transition plan is successfully implemented across the organisation. Given the large-scale, entity-wide changes required, robust internal monitoring and accountability mechanisms are essential for achieving performance targets and adapting to evolving conditions.

Key elements of internal monitoring include:
1. **Board-level oversight and governance systems**. The board of directors plays a pivotal role in setting, monitoring, and recalibrating the transition plan, including performance targets, action plans, and financial strategies.
- Board approval ensures accountability, with corrective measures implemented for missed milestones.
- The transition plan undergoes reassessment at least every five years, accommodating new developments such as emerging technologies.
- Robust internal governance systems must be established to support effective oversight and performance tracking.

2. Recalibration and feedback mechanisms. Performance targets must be recalibrated regularly to reflect market shifts, technological advances, and continuous improvement goals.
- Companies should use tracking tools (e.g., GHG tracking tools) to monitor progress, ensuring alignment with performance targets.
- This tracking process serves as a feedback loop to Hallmarks 2 and 3, ensuring any deviations are addressed promptly, keeping the entity on track toward its sustainability commitments.

2.5 Hallmark 5: External reporting

2.5.1 Step 9: External Reporting

• Disclosures to external stakeholders

Transparency and external verification are critical for credibility. Disclosure also enables comparability across peers and allows global, national, and sector progress to be assessed.

Key elements of external reporting include:

1. **Public disclosure**. Companies must **publicly disclose key information upfront**, providing transparency to investors and stakeholders. This includes:
- **Performance targets** and their rationale, aligned with Hallmark 1.
- **Calculation methods** and tools to track progress.
- A **narrative transition strategy**, detailing planned changes to achieve the targets.

If linked to **fixed-term financial instruments**, such as sustainability-linked bonds (SLBs), companies must focus on the relevant performance targets over the financing term, while maintaining transparency on **long-term goals** to reflect sustained climate alignment. Ongoing disclosure should include:
- **Annual progress reports**, with explanations of factors affecting performance.
- Alignment of **capex with the transition strategy**, showing how investments impact emissions and business operations.
- Updates on **planned actions**, such as asset decommissioning or supplier adjustments.
- **Mitigating actions** if progress lags, together with implications for revised plans.

Where commercial confidentiality is a concern, **detailed disclosures** can be shared with verifiers while maintaining higher-level public reporting.

2. **Independent verification.** All disclosed information must be supported by independent verification from external experts, such as auditors or environmental consultants, ensuring that progress claims are credible. This assurance report builds trust with stakeholders, demonstrating that the entity's efforts are aligned with its stated goals and transition plan.

External reporting ensures that companies are transparent and accountable, providing stakeholders with reliable insights into progress and alignment with long-term sustainability objectives.

In summary, transition plans are vital for companies striving to align with the Paris Agreement, enabling sustainable evolution through clear targets, robust strategies, adequate financial support, and strong leadership. These plans should integrate key elements such as interim milestones, governance frameworks, and public disclosures to ensure transparency and accountability. Regular, standardised progress reporting allows stakeholders to evaluate credibility, while fragmented data can hinder assessments.

Third-party verification enhances trust, providing investors with confidence in the entity's commitment to its transition objectives.

With all the steps to develop a transition plan now outlined, the following checklist serves as a quick reference, helping organisations ensure that each key element of their transition plan is addressed and aligned with best practices, from planning to execution and monitoring.

Table 4 **Transition plan checklist**

Prerequisite steps			**Check (Y/N)**
Step I		Calculate the entity's baseline emissions - scopes 1, 2 and 3	
Step II		Entity's transition risk assessment	
The planning stage			
Hallmark 1: Performance targets	**Step 1**	**Select a common sectoral decarbonisation pathway**	
		Transition pathway of the entity is benchmarked or aligned with science-based guidance (clearly stating which one is followed).	
		CLIMATE BONDS	
		SBTi	
		TPI	
		ACT	
		Other (please mention)	
	Step 2	**Selection of performance targets**	
		Key performance indicators (KPIs)	
		KPI 1	
		KPI 2	
		KPI 3	
		Selection of SPTs (sustainability performance targets)	
		Short term target (next three years)	
		Mid-term target (until 2030)	
		Long term target (until 2050 or net zero)	
Hallmark 2: Robust plans	**Step 3**	**Detailed transition strategy and action plan**	
	Step 4	**Financial plan for transition**	
	Step 5	**Governance mechanism - role and responsibilities defined to oversee the transition strategy**	
	Step 6	**Board approval**	

The implementation stage			**Check (Y/N)**
Hallmark 3: Implementation action	**Step 7**	**Execution of the plan**	
		Delivery of the interim milestones	
		Rolling out of capex and opex plans	
		Decommissioning activities (if planned)	
		Supplier engagement (if planned)	
		Training senior executives and board members	
		Corrective measures if any gaps are identified	
Hallmark 4: Internal monitoring	**Step 8**	**Internal monitoring setup**	
		Board-level oversight and governance systems are setup	
		Recalibration and feedback mechanism	
Hallmark 2: External reporting	**Step 9**	**External Reporting**	

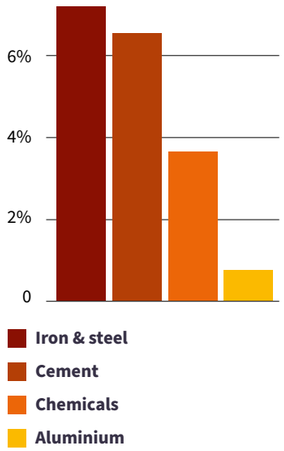
Source: compiled by Climate Bonds

Third-party verification enhances trust, providing investors with confidence in the entity's commitment to its transition objectives.

The next section will cover sector-specific pathways for hard-to-abate sectors, such as steel, cement, and chemicals, providing guidance for companies operating in these sectors to develop Paris Agreement aligned transition plans and the decarbonisation strategies or processes required to do so. These measures or projects can be used during the third step: developing transition strategy and planning stage.

3 Sectoral pathways and qualifying assets or projects for Paris Agreement-aligned transition plans

Figure 6 **Industry sector share of global CO2 emissions, 2022**[12]



This section focuses on three pivotal sectors, steel, cement, and basic chemicals, due to their critical impact on global emissions and their unique challenges in achieving decarbonisation. Together, these industries account for over 70% of industrial CO2 emissions globally, underscoring their central role in the transition to a low-carbon economy.[11]

Steel and Cement. As the largest industrial emitters, these sectors represent over 7% and 6% of global CO2 emissions, respectively. Their emissions trajectories remain misaligned with the Paris Agreement goals, and their long asset lifetimes, exceeding 40 years, risk locking in high emissions without decisive action. [14]

Basic chemicals. The chemicals sector, while ranking third after steel and cement in terms of total emissions, is the largest industrial energy consumer globally.[15] Basic chemicals, in particular, are a major focus for decarbonisation, accounting for around 60% of energy consumption and 75% of the industry's scope 1 and 2 GHG emissions.[16] The transition of the chemicals sector is essential due to its deep interlinkages with other industries and its role in the production of nearly all manufactured goods, including pharmaceuticals, electronics, and construction materials. Addressing both production-related and scope 3 emissions is critical to meeting climate goals.

3.1 Steel

- **Steel sector carbon footprint**
- **Opportunities and challenges**

Steel production is a significant contributor to climate change, accounting for approximately 7% of global CO_2 emissions, making it the largest emitter among industrial sectors. Transforming this capital-intensive industry into a low-carbon model depends heavily on the deployment of innovative technologies and substantial financial support. The long lifespan of blast furnaces means that investment decisions made this decade will shape production processes for decades. Aligning these investments with climate goals is critical to avoid long-term carbon lock-in and enable the transition to sustainable steel production.

7%

Steel production accounts for approximately 7% of global CO_2 emissions

The global steel industry is at a turning point, with 71% of existing coal-based blast furnaces reaching the end of their operational life by 2030.[17] This presents a unique opportunity to reinvest in and adopt sustainable production methods. For example, Vietnam's nationally determined contributions (NDCs) commit to reaching peak emissions by 2030 and achieving carbon neutrality by 2060. To meet these ambitious goals, the steel sector must develop actionable emissions-reduction plans.

Decarbonising steel is not just a technological challenge but also requires financial and political alignment. New decarbonisation levers guided by sector-specific criteria must be coupled with private sector investment and supported by robust policy measures. The global debt market, valued at USD120tn, offers ample capacity to finance this transition. However, Climate Bonds research highlights a supply shortage of credible green bonds, signalling strong investor demand to fund such transformations.

The steel industry is a cornerstone of Vietnam's economy, significantly influencing both domestic industrial growth and global supply chains. In 2023, Vietnam produced 20 million tonnes of steel, ranking 12th globally in crude steel production. The sector encompasses a diverse product range, including construction steel, coated steel, and hot-rolled coils (HRC), which collectively contribute to 96% of Vietnam's industrial exports to the European Union.[18]

Despite its robust export economy, exporting nearly 11 million tonnes of steel in 2023, Vietnam's steel sector faces mounting challenges from evolving global sustainability standards.[19] The EU's Carbon Border Adjustment Mechanism (CBAM), which imposes taxes on imports based on carbon emissions, threatens Vietnam's competitiveness unless it transitions to greener production processes. With the steel sector responsible for 7-9% of Vietnam's total emissions and 46% of industrial emissions, decarbonisation is critical to achieving the country's 2050 carbon neutrality goals. [20]

Vietnam's steel industry is adopting several strategies to achieve its green transition objectives:

1. Technology upgrades. Investments in emission-reducing technologies, such as electric arc furnaces and energy efficient measures, are underway. Additional technical measures are detailed in subsequent sections of this report.
2. Supply chain adjustments. Collaborations with suppliers to procure low-emission raw materials are gaining prominence.
3. Product diversification. Expanding into specialty steel products and reducing reliance on traditional exports are helping mitigate exposure to carbon tariffs.

However, the transition faces significant hurdles. Heavy reliance on coal and coke in steel production, combined with the need for substantial capital investments, complicates the shift to low-carbon operations. Access to affordable financing and renewable energy infrastructure is essential, as is government support in the form of favourable policies and green financing initiatives.

3.1.1 Decarbonisation measures and criteria aligned with the Paris Agreement

- **Decarbonisation measures and potential reduction in emissions**
- **Measures that can be taken in existing facilities**
- **Measures that can be taken in new facilities**

Decarbonisation measures within steel facilities take into account the type of facility where the measure will be implemented. This is done to reflect that for steel primary production (steel produced from iron ore via the BF-BOF or DRI process) the implementation of small incremental measures will not suffice to achieve 2030 reduction targets. Consequently, capital investments should be focused on achieving significant emissions savings at the facility level, as per the percentages shown in 6. Table 5 outlines a range of measures that can be implemented individually or in combination to achieve the desired reduction in carbon intensity, in line with the percentages mentioned in Table 6.

Table 5 **Criteria for decarbonisation measures or retrofitting activities**[21]

Decarbonisation measures	Climate mitigation criteria for measures
Optimisation of electric arc furnace (EAF), installation and operation of other mitigation measures associated with EAF facilities.	Automatically eligible.
Measures associated with a production line with a blast furnace (BF) that became operational in 2007 or later.	The investment shall not be for relining; AND the decarbonisation measure(s) that has been/will be implemented at the facility and has/will reduce the facility's emissions intensity (tCO2/t steel) between 2022 and 2030 by: • 20% if the pre-decarbonisation baseline emissions intensity is greater than or equal to 2 tCO2/t steel; OR • 15% if the pre-decarbonisation baseline emissions intensity is less than 2 tCO2/t steel.
Measures associated with a production line with a blast furnace (BF) that became operational prior to 2007.	The investment shall not be for relining; AND the decarbonisation measure(s) has been/will be implemented at the facility and has/will reduce the facility's emissions intensity (tCO2/t steel) between 2022 and 2030 by 50%.
Measures associated with a production line with a DRI.	Either: a) if plant is fossil-gas based, the measure(s) have been/ will be implemented at the facility and have/will reduce the facility's emissions intensity (tCO2/t steel) between 2022 and 2030 by 20%; OR b) if plant is coal based, the measure(s) have been/will be implemented at the facility and have/ will reduce the facility's emissions intensity (tCO2/t steel) between 2022 and 2030 by 40%.

Table 6 **Examples of steel production capital investments, subject to meeting the thresholds mentioned in Table 4 above**[22]

Asset and activity types	Example use of proceeds (capital investments)	CO2 emissions reduction potential
Heat recovery	Installation, upgrade, and operation of heat recovery systems	5%-15%
Optimisation of blast furnace	Pulverise coke injection, top gas recycling, stove waste gas heat recovery	17%-21%
Optimisation of basic oxygen furnace	Recovery of BOF gas and sensible heat	1%
Optimisation of coke plant	Coke dry quenching	1%-3%
Optimisation of sinter plants	Sinter plant heat recovery	1%
Optimisation of EAF	Oxyfuel burners, EAF scrap preheating, CHP from waste heat.	30%
Optimisation of rolling and finishing and reheat furnace	High efficiency burner, flue-gas monitoring, combustion optimisation, exhaust gas heat recovery.	5%
Optimisation of casting	Near net-shape casting.	5%
Optimisation of monitoring and control systems	Installation, upgrade, and operation of advanced sensors and digitised control equipment and systems.	1%-3%
Carbon capture utilisation and storage	Installation, upgrade, and operation of infrastructure and equipment related to CO2 capture of emissions from steel production.	30%-90%
Fuel switching	Infrastructure, revamps, or modifications of equipment needed for the production of steel using hydrogen or biomass as a reducing agent.	Varies depending on the alt fuel and substitution rate but overall substantial potential.
Electrification of heat	Electrification of reheating furnace.	Varies depending on the alt fuel and substitution rate but overall substantial potential .

New facilities and criteria aligned with the Paris Agreement

Table 6 lists investments in new assets that are considered decarbonising assets due to their low emissions potential, and any associated eligibility Criteria specific to those investments (as per Climate Bonds Steel Criteria). The type of facilities listed are in alignment with the deep decarbonisation of the sector.

Table 7 **Eligible new iron and steel production facilities and applicable Criteria for each type of facility**[24]

Eligible facility	Facility specific mitigation Criteria
BF-BOF production line with integrated CCS or CCUS	CCS or CCUS should capture at least 70% of all emissions.
Smelting reduction production line with integrated CCS or CCU	CCS or CCUS complies with Criteria in Appendix A1.
Fossil gas-based DRI-EAF production line with integrated CCS or CCU	
Fossil gas-based DRI with integrated CCS or CCUS	
Scrap-based electric arc furnace (EAF)	The facility needs to use 70% of scrap as total annual inputs; OR the combined scrap and (100%) hydrogen-based DRI should add to at least 70% of the EAF total annual inputs.
(100%) Hydrogen-based DRI	Hydrogen meets the Criteria in Climate Bonds Hydrogen criteria
(100%) Hydrogen-based DRI-EAF production line	
Electrolysis of iron ore steelmaking production line	A plan that describes how the use of renewable energy will be increased/introduced in the facility within the term of the bond through different strategies such as: a) Increasing renewable-based captive power generation; b) Increasing renewable-based power purchase agreement. The plan shall be provided with evidence of the strategies that will be implemented. Progress of the implementation plan to be assessed every 36 months.

3.1.2 Thresholds and climate-aligned pathway for steel production

Investors seeking transition-focused opportunities increasingly prioritise credible transition plans grounded in science-based targets. Within the steel industry, this credibility often hinges on sectoral pathways tailored to different production methods, reflecting the significant disparity in carbon intensities between primary (iron ore–based) and secondary (scrap-based) steelmaking. In the previous sections, we examined various measures that enable entities to reduce their emissions. Here, the Sustainable STEEL Principles are introduced as a framework consistent with a 1.5°C scenario to guide net-zero alignment. By evaluating each steelmaker's emissions intensity against an adaptation of the International Energy Agency Net-Zero by 2050 Scenario, weighted according to external scrap usage, this approach supports the development of entity-specific, science-backed targets and meets the rising expectations of investors for rigorous, transparent decarbonisation strategies. Figure 4 shows the resulting decarbonisation trajectories for primary and secondary steel production based on the NZE adjusted as previously explained, and Table 8 shows the respective emissions intensity values.

Figure 7 **The emissions pathway for all steel production companies (scope 1 and 2 emissions combined)**

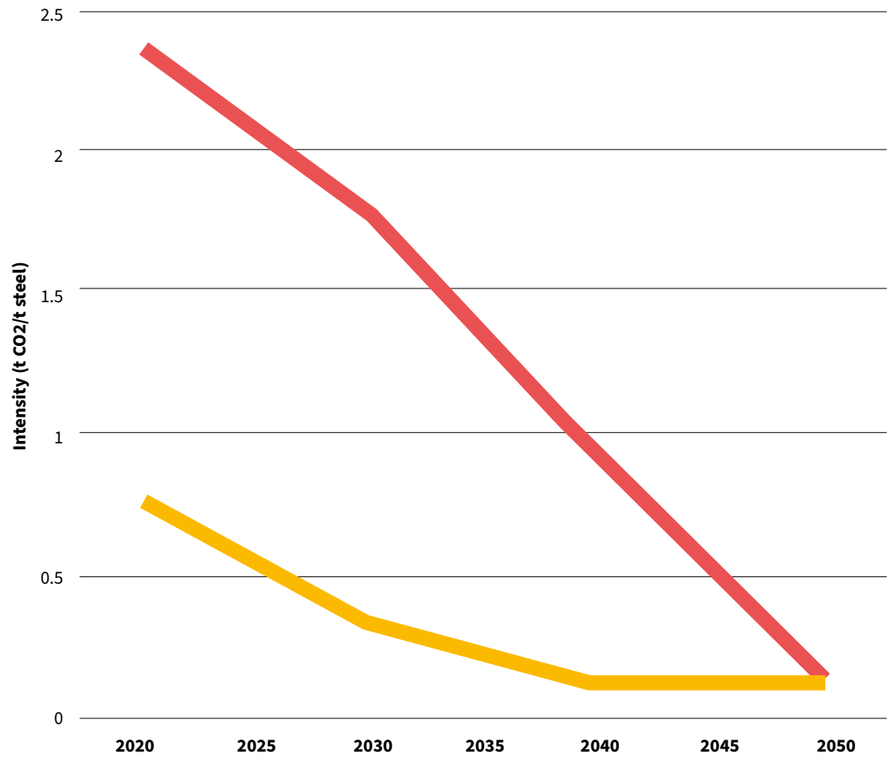


Table 8 **Threshold values forming the emissions pathway for all steel production companies**[26]

Year	Primary intensity (t CO2/t steel)	Secondary intensity (t CO2/t steel)
2020	2.38	0.75
2025	2.09	0.54
2030	1.81	0.32
2035	1.35	0.22
2040	0.90	0.12
2045	0.51	0.12
2050	0.12	0.12

3.1.3 Case study: JSW Steel

Overview

JSW Steel, India's leading integrated steel manufacturer, issued its inaugural sustainability-linked bond (SLB) in September 2021, raising USD500m. This financing aligns with the company's climate ambitions, targeting emissions reduction through measurable and time-bound commitments.

Amount issued: USD500m
Issue date: 23 September 2021
Maturity date: 5 April 2032
Financial mechanism: step-up (0.375%)

Key performance indicators (KPIs) and targets

The bond is tied to JSW Steel's GHG Emissions intensity (scopes 1 and 2), with the following targets:
2024: 2.37 tCO_2/tcs
2030: 1.95 tCO_2/tcs (23% reduction from a 2020 baseline of 2.53 tCO_2/tcs)

Despite achieving a pace of emissions reduction consistent with Climate Bonds pathways, JSW's 2030 target (1.95 tCO_2/tcs) does not fully align with the Climate Bonds pathway for steel, which sets a threshold of 1.8 tCO_2/tcs by 2030.

Key transition strategies JSW Steel's transition plan includes:

- Enhancing energy and process efficiency.
- Diversifying into hydrogen as an energy source.
- Investing in R&D for alternative fuels.
- Engaging suppliers to decarbonise the value chain.
- Transitioning to renewable energy sources.

While these measures address all emissions scopes, their credibility is hindered by the lack of a detailed, quantified roadmap and the allocation of only 3.13% of capex to sustainability interventions.

Governance and reporting

JSW Steel's transition efforts are steered by a dedicated climate action group, adding credibility to its mitigation strategies. The company also practices robust annual reporting, with externally verified KPIs and detailed emission breakdowns, meeting Climate Bonds' alignment standards.

Assessment

The SLB is categorised as 'Aligning' under the Climate Bonds framework, as it demonstrates progress in emissions reduction and robust governance. However, the absence of a long-term net-zero target and insufficient capex allocation to sustainability efforts weaken the overall transition narrative.

3.2 Cement

As the second-largest industrial emitter, the cement industry accounts for approximately 7% of global CO2 emissions, with demand for cement predicted to increase.[27] Cement is a critical input for many activities, including buildings and infrastructure, and is a key material in the net-zero transition. However, it is currently very high carbon and will need significant technological and financial investment to play its role in achieving a zero-carbon future. The cement sector is at an early yet critical stage in the transition to net zero. While progress is accelerating, the carbon intensity of global cement production has only slightly decreased in recent decades, and it is significantly behind where it needs to be on a Paris-aligned pathway.[28]

7%

The cement industry accounts for approximately 7% of global CO2 emissions

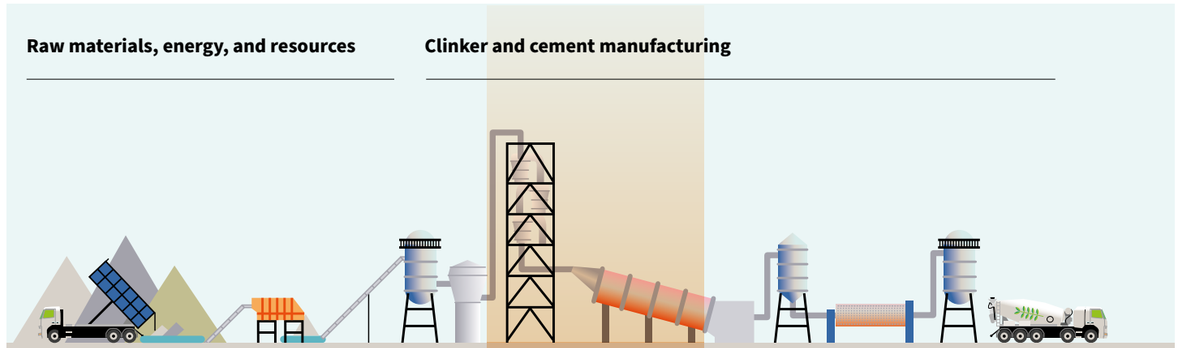
Vietnam is the third largest cement producer globally, and emissions from this production account for about 15% of total emissions from the economy. There are 90 cement production lines in Vietnam with a total capacity of about 140 million tonnes per year.

In 2022, the country produced 118 million tonnes per annum (Mtpa) of cement, ranking third globally. Exports reached 31 Mt, valued at USD 1.8 billion, with key markets including China, the Philippines, Bangladesh, the US, and Guatemala.[29] Cement has become a cornerstone of Vietnam's economy, underpinning both domestic infrastructure development and international trade. However, this rapid growth has come at a significant environmental cost, as cement production contributes heavily to Vietnam's GHG emissions.

Figure 8 **Cement making process**

3.2.1 Decarbonisation levers in cement manufacturing

The cement making process consists of several steps, as detailed in Figure 8. For the purposes of reducing emissions, the most important steps are contained in the red box.



	Quarry	Crusher	Transport	Raw mill	Kiln and preheater/ precalcinator		Cooler	Cement mill	Logistics	**Total**
Energy, mega-joule/ton	40	5	40	100		3150	160	285	115	**3895**
CO_2 emissions, kilogram/ton	3	1	7	17	479 Calcination process	319 Fossil fuel combustion	28	49	22	**925**

Given that over 80% of emissions are related to the kiln and preheater/precalcinator as above, these processes are the focus of this guidebook. Majority of emissions are linked to the current production process and can broadly be separated into two categories:

- **Non-combustion emissions (calcination process):** around 60% of the direct emissions in the production process do not result from fuel combustion, but from chemical reactions in the clinker calcination process when limestone is calcinated in the kiln. In other words, these cannot be reduced by substituting fuels. This is very different to other industrial processes where the bulk of process emissions relate to fuel use.
- **Fuel combustion emissions:** most of the remaining CO2 emissions (about 30%) are produced by fuel combustion to make clinker, which is the main constituent of cement and is produced in a kiln at around temperatures of 1450°C. The high temperatures are achieved by burning fossil fuels (predominantly coal), biomass or alternative fossil and mixed wastes.

3.2.2 Decarbonisation measures or projects and criteria aligned with Paris Agreement

The following are the measures that automatically align with the Paris Agreement:

- Installation, upgrade, and operation of precalciners.
- Installation, upgrade, and operation of heat recovery systems.
- Installation, upgrade, and operation of digitised control equipment or infrastructure, which may include:
  - Sensors and measurement tools (including software to allow real-time and close control of processes to improve efficiency).
  - Communication and control (including advanced software and control rooms, and automation of plant processes).
- Installation, upgrade, and operation of testing equipment, for example:
  - Automated XRD systems.
- Electrification of heat (for example, electrified kiln processes).
- Installation, upgrade, and operation of equipment dedicated to calcined clay use in cement production as distinct from clinker.
- Installation, upgrade, and operation of equipment dedicated to processing legacy or historic fly ash and blast furnace slag, extant from power plants that no longer exist.

The following are the measures that are eligible subject to meeting measure-specific Criteria:

Table 9 **Measures that are eligible subject to meeting measure-specific Criteria**[32]

Decarbonisation measures	Criteria
Installation, upgrade, retrofit, and operation of measures which achieve emissions savings equivalent to the emissions decrease for facilities between the start year of the bond/loan and the end year.	Emission reduction in-line with cement sector pathway (Section 2.2.3)
Installation, upgrade, and operation of carbon capture and storage equipment.	CCS Criteria (Appendix A1)
Installation, upgrade, and operation of carbon capture, storage, and utilisation processes that utilise CO2 either through curing carbonation, mineralisation of CO2 in concrete waste, or production of recyclable products.	CCUS Criteria (Appendix A1)
Infrastructure, revamps, or modifications of equipment needed for the production of cement using hydrogen as a fuel.	Climate Bonds Hydrogen Criteria

3.2.3 Thresholds and climate-aligned pathway for cement production

Investors seeking transition-focused opportunities increasingly expect cement producers to adopt credible, science-based roadmaps to net zero. In line with both the Science Based Targets initiative (SBTi) and the Transition Pathway Initiative (TPI), the sector's decarbonisation trajectory must halve emissions by 2030 and reach net zero by 2050. Notably, these pathways acknowledge that technological breakthroughs will drive more significant emissions reductions in the 2030–2040 period than in 2020–2030, a pattern that logically extends to individual plants as well as corporate-level strategies. While the ultimate goal is for every 'green' cement plant to achieve zero emissions by mid-century, current technology does not yet fully enable zero-carbon cement. Accordingly, continuous reviews of these Criteria will be essential to determine whether evolving technologies can fulfil the ambitious expectation that zero-carbon cement becomes the green standard by 2050.

The pathway GHG intensity metric is in terms of t CO2/ t cementitious product or t CO2/ t cement. 'Cementitious product' means clinker, cement, and cement substitutes produced by the reporting entity. The full definition for t CO2/ t cementitious product shall be according to the Cement CO2 Protocol v3.0 (2011) 'Specific CO2 per ton of cementitious product'.[13]

The facility-level emissions intensity thresholds over time are given in Figure 6 and Table 9. The applicant must first calculate the facility's correction factor-adjusted emissions intensity to account for the cement grade being produced as per section A2 in the appendix. This number can then be compared to the relevant threshold in this section.

Figure 9 **Emissions pathways for all cement production facilities**[34]

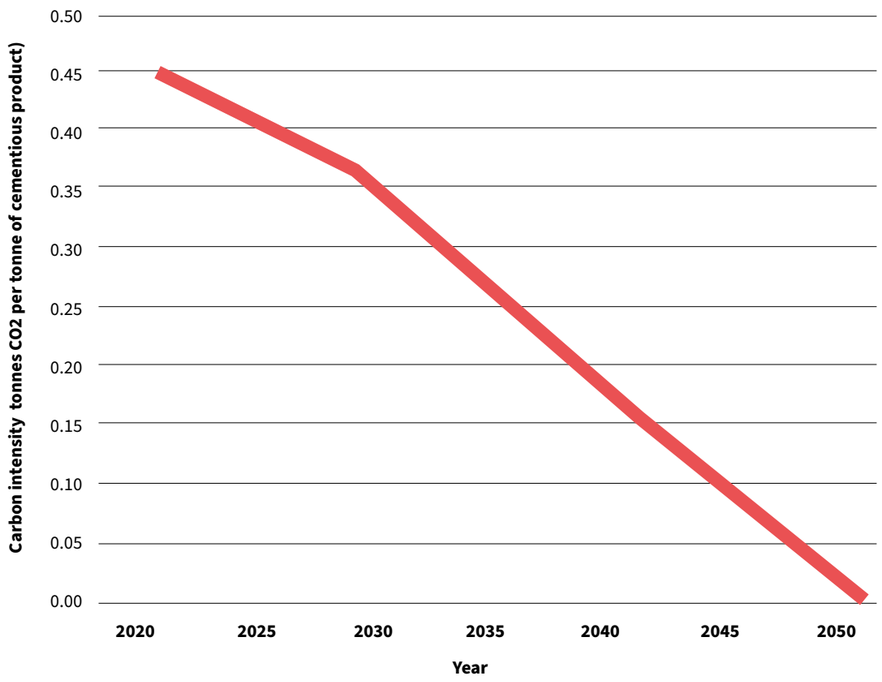


Table 10 **Threshold values forming the emissions pathway for all cement production companies**[35]

Year	Carbon intensity ($t CO_2$ / t cementitious product)	Year	Carbon intensity ($t CO_2$ / t cementitious product)
2020	0.469	**2036**	0.253
2021	0.458	**2037**	0.234
2022	0.448	**2038**	0.216
2023	0.437	**2039**	0.197
2024	0.427	**2040**	0.179
2025	0.416	**2041**	0.161
2026	0.406	**2042**	0.143
2027	0.395	**2043**	0.125
2028	0.384	**2044**	0.107
2029	0.374	**2045**	0.089
2030	0.363	**2046**	0.071
2031	0.345	**2047**	0.054
2032	0.326	**2048**	0.036
2033	0.308	**2049**	0.018
2034	0.289	**2050**	0.000
2035	0.271		

3.2.4 Case study: Holcim Ltd

130
Mt CO2e
emissions on 2022

Overview

Holcim Ltd, a leading Swiss manufacturer of building materials, reported total GHG emissions of 130 Mt CO_2e in 2022. The emissions breakdown includes 60% from scope 1, 4% from scope 2, and 36% from scope 3. Recognising the critical need for decarbonisation in the cement sector, Holcim has adopted sustainability-linked bonds (SLBs) as a key financial mechanism to accelerate its transition. By November 2023, Holcim had issued seven SLBs, all of which focus on GHG intensity reductions within scope 1 emissions.

Holcim's most recent SLB, issued on 19 May 2022, demonstrates the company's commitment to aligning its operations with sustainability goals while leveraging innovative financial tools to drive accountability and performance.

Key performance indicators and targets

Recent SLB Details:
- **Amount issued:** USD147.5m
- **Issue date:** 19 May 2022
- **Maturity date:** 5 April 2029
- **Financial mechanism type:** step-up (0.35%)

Performance targets

1. GHG emission intensity (scope 1):
a. Target of 520 kg CO_2 per tonne of cementitious material by 2025.
b. This target, while exceeding the sector pathway thresholds of 539 kg CO_2/t by 2025 and 463 kg CO_2/t by 2030, aligns with the required rate of reduction outlined in the Climate Bonds methodology.

95%
Scope 1 and 2 reduction by 2050

44%
of scope 1 and 2 emission reductions are reliant on carbon capture, utilisation, and storage (CCUS) technologies

2. Water usage intensity:
a. Reduction of 25% versus 2018 levels by 2025.
Holcim's overarching decarbonisation targets include:
Scope 1 and 2:
- A 22.4% reduction by 2030 and 95% by 2050, relative to 2018, validated by the Science Based Targets initiative (SBTi) as aligned with a 1.5°C scenario.
Scope 3:
- A 90% emissions reduction by 2050, with discrete medium-term targets aligned with well-below 2°C pathways.

Key transition strategies

Holcim's transition plan emphasises a well-structured approach to decarbonisation across all emissions scopes:
Scope 1 and 2:
- Key levers include energy and design efficiency, clinker reduction, and energy decarbonisation. These measures are quantified within the strategy, reflecting a clear pathway to achieve targeted reductions.
Scope 3:
- Focused on decarbonising downstream transport and engaging with the supply chain to lower emissions across its value chain.
Financial commitment:
- To support these efforts, Holcim has committed to an annual green capital expenditure (capex) of CHF500m by 2025.

While these measures are commendable, 44% of scope 1 and 2 emission reductions are reliant on carbon capture, utilisation, and storage (CCUS) technologies. While CCUS can play a role in hard-to-abate sectors, Climate Bonds advocates minimising its use for materially significant emissions reductions to prioritise direct mitigation strategies.

Governance and reporting

Holcim's transition plan is supported by a robust governance structure that ensures transparency and accountability:
- Climate-related performance and strategy are overseen directly by the board of directors.
- The executive committee is held accountable for achieving the company's decarbonisation goals.
- Senior management compensation is tied to climate-related performance, aligning financial incentives with sustainability outcomes.

Assessment

Holcim's SLBs align with Climate Bonds SLB Database Methodology. Despite slightly exceeding the sector-specific GHG intensity pathway thresholds, the company's targets meet the required rate of reduction and are supported by a detailed transition plan.

3.3 Basic chemicals

The basic chemicals sector is a critical pillar of industrial production, providing essential feedstocks for industries including pharmaceuticals, agriculture, construction, electronics, and consumer goods. These chemicals are fundamental building blocks, forming the backbone of modern manufacturing and contributing to global economic growth.

However, the sector is also one of the most energy-intensive and carbon-emitting industries, significantly contributing to climate change and environmental degradation. The production of basic chemicals requires high temperatures and energy-intensive processes, leading to substantial scope 1 and scope 2 GHG emissions.

10%

The chemicals sector is responsible for approximately 10% of the world's total energy demand

Carbon footprint of the basic chemicals sector

The chemicals sector is the largest industrial energy consumer globally, responsible for approximately 10% of the world's total energy demand.[36] Basic chemicals account for nearly 60% of the chemical industry's energy consumption and 75% of its scope 1 and 2 GHG emissions.[37,38]

Key emission sources include:

- Direct emissions from fuel combustion and chemical reactions (scope 1).
- Indirect emissions from purchased electricity and heat (scope 2).
- Significant upstream scope 3 emissions from raw material extraction and transportation.

Vietnam's chemical sector is a growing contributor to industrial emissions, with its rapid expansion driven by increasing demand in agriculture, manufacturing, and infrastructure.

The production of ammonia, methanol, ethylene, propylene, benzene, and carbon black plays a crucial role in industrial applications, but these processes are currently highly carbon intensive. Without urgent intervention, the sector risks carbon lock-in, exposing companies to regulatory risks, trade barriers, and capital constraints.

- **Regulatory pressure.** Policies such as the EU's Carbon Border Adjustment Mechanism (CBAM) could impact Vietnamese chemical exports unless producers adopt low-carbon pathways.
- **Investor demand.** Financial institutions are increasingly prioritising green bonds and sustainability-linked financing, requiring companies to align with decarbonisation strategies.
- **Competitive advantage:** Early adoption of low-carbon technologies can position companies as global leaders; ensuring market access, compliance, and long-term viability.

3.3.1 Decarbonisation levers in basic chemicals manufacturing

To transition toward a low-carbon future, the basic chemicals sector must adopt multiple decarbonisation pathways that **reduce energy consumption, shift to alternative feedstocks, electrify processes, and integrate carbon capture technologies.** These levers are essential to achieving net-zero emissions while maintaining industrial competitiveness and supply chain resilience.

1. Energy efficiency and resource efficiency

Energy efficiency is a crucial first step in decarbonising chemical manufacturing. Given that the sector is **one of the largest industrial energy consumers**, optimising energy use can result in immediate emissions reductions. However, given the recent rise in global energy prices, most companies have already exploited conventional energy efficiency measures, meaning that further gains are likely to be incremental rather than transformative.

In contrast, **resource efficiency** presents a significant opportunity for further decarbonisation. A 2022 study by **Systemiq and the University of Tokyo** identified seven alternative pathways for reducing emissions across four major chemical groups. These pathways rely on **circular economy principles and resource efficiency measures to reduce global chemical demand by 23-33%** compared to a business-as-usual scenario, which would have otherwise grown from 693 Mt in 2020 to 1692 Mt by 2050.[39]

64%

Scope 3 emissions account for approximately 64% of total emissions in the chemicals sector

2. Alternative feedstocks and circularity

Scope 3 emissions account for approximately 64% of total emissions in the chemicals sector, with some estimates even higher.[40] The Science-Based Targets initiative (SBTi) mandates that chemical companies set targets for scope 3 reductions if these emissions exceed 40% of total emissions, making alternative feedstocks and circularity critical to any credible decarbonisation plan.

Reducing scope 3 emissions through feedstock substitution

Most scope 3 emissions arise from the release of GHGs stored in chemical products once they reach the end of their lifecycle. For instance:

- Single-use plastics are incinerated soon after production, emitting stored carbon back into the atmosphere.
- Durable chemicals, such as coatings and synthetic fibres, release emissions years after production.

To minimise reliance on fossil feedstocks, chemical manufacturers must transition to alternative carbon sources, including the following:

- Point-source carbon capture (PSC) captures CO_2 emissions from industrial sources and reintegrates it as chemical feedstock.
- Biomass-derived feedstocks replace petrochemical-based raw materials with bio-based alternatives.
- Circular economy solutions implement chemical recycling processes such as:
  - Pyrolysis, which breaks plastics down into their original monomers for reuse.

35%

Olefins and aromatics production, accounts for 35% of total scope 3 emissions in the chemicals sector

- Gasification converts waste materials into syngas, a building block for new chemicals.
- Incineration with carbon capture and usage (CCU) recovers CO_2 emissions from waste-to-energy processes.

Circularity in the chemical industry

Circularity not only reduces feedstock demand but also significantly lowers scope 3 emissions. Currently, most chemical products are disposed of via landfill or incineration without emissions abatement.

- Olefins and aromatics production, used in plastics manufacturing, accounts for 35% of total scope 3 emissions in the chemicals sector.
- End-of-life solutions are underdeveloped, making landfill disposal and unabated incineration the dominant waste treatment methods.

3. Electrification of chemicals manufacturing

Chemicals manufacturing remains heavily reliant on fossil energy, with most processes powered by natural gas, coal, or fuel oil. While electrification remains difficult for high-heat processes, there are multiple low-heat applications in the chemicals sector that can already be powered by renewable electricity.

The One Earth Climate Model (OECM) has concluded that the global chemicals sector can achieve a 1.5°C-aligned pathway by rapidly transitioning to renewable energy. A 2022 review of the model provided granular sector transition pathways, identifying electrification as a primary decarbonisation strategy.

Key electrification opportunities include:
- Low-heat chemical processes such as distillation, drying, and separation can be converted to electric-powered systems.
- Electrified steam-generation using high-temperature heat pumps.
- Electric arc furnaces (EAFs) for plastics recycling and ammonia synthesis.

4. Carbon capture, usage, and storage (CCUS)

The Intergovernmental Panel on Climate Change (IPCC) has identified carbon capture, usage, and storage (CCUS) as essential for decarbonising hard-to-abate industries, including chemicals manufacturing.
CCUS plays a dual role in:
- Capturing emissions from chemical production (point-source capture).
- Providing a sustainable feedstock for circular carbon applications.

Types of CCUS and their role in chemicals:
- Point-source (PS) carbon capture captures CO_2 directly from chemical plants before it enters the atmosphere.
- Direct air capture (DAC) removes CO_2 from ambient air, reducing historical emissions.
- Bioenergy with carbon capture and storage (BECCS) uses bio-based chemical production combined with CCUS to achieve net-negative emissions.

3.3.2 Decarbonisation measures or projects and criteria aligned with Paris Agreement

To achieve deep decarbonisation, manufacturers must implement a range of **mitigation measures** across **energy efficiency, low-carbon process technologies, carbon capture, alternative feedstocks, and energy sources**. The following table outlines eligible decarbonisation measures and their corresponding mitigation criteria, ensuring alignment with the **Climate Bonds Initiative Basic Chemicals Sector Criteria**. These measures serve as a framework for companies looking to **reduce emissions, enhance resource efficiency, and transition toward low-carbon chemical production** while meeting **Paris Agreement-aligned targets.**

Table 11 **Eligible decarbonisation measures and Paris-aligned criteria**[45]

Decarbonisation measure	Related projects	Mitigation criteria
Energy efficiency measures	Revamps, modifications or acquisition of equipment (boilers, furnaces, reactors, heat exchanger, distillation columns and other separation units, etc.).	At least a 30% improvement in energy efficiency.
Switching to low-carbon process technologies	Revamps, modification, and acquisition of equipment and other infrastructure needed for the implementation and operation of low-carbon process technologies.	Alternative process technology does not release direct process CO_2 emissions, e.g., methane pyrolysis, catalytic partial oxidation of methane to methanol.
Carbon Capture and Storage (CCS)	Infrastructure related to CO2 capture of emissions from the basic chemicals production, transportation, and storage.	Minimum 90% CO_2 capture rate from the entire facility; CO_2 must be suitably transported and stored.
Using hydrogen/ CO2/Biomass as a feedstock Use of recycled material as feedstock	- Infrastructure for production using green hydrogen/ CO2/biomass. - Refurbishment and retrofitting of facilities to use green hydrogen/CO2/biomass. - Acquisition of equipment to produce basic chemicals using green hydrogen/CO2/biomass.	For Hydrogen - Climate Bonds Hydrogen Criteria. CO_2 source must be from direct industrial emissions; CO_2 must be used for durable or recyclable products. For Biomass – Climate Bonds Bioenergy Criteria Recycled material should represent at least 20% of feedstock in regions without local recycling regulations (or meet the prevailing regional standard if higher).
Electrification of the processes	Revamps, modifications, and acquisition of equipment (furnaces, reactors, separators, etc.) and other infrastructure necessary for electrification of the processes.	Automatically eligible.
Heat supplied from geothermal, solar thermal, or waste heat recovery systems	New heat exchange equipment, such as evaporators, furnaces, boilers, etc. Revamps or modifications to heating related equipment in existing process.	Automatically eligible.
Using hydrogen / biomass as an energy source	Revamps or modifications to equipment (boilers, furnaces, burners, etc.) in existing utilities system required for the use of hydrogen/biomass as fuel. Infrastructure for the production of a basic chemical in scope using hydrogen/biomass as an energy source	For Hydrogen - Climate Bonds Hydrogen Criteria For Biomass – Climate Bonds Bioenergy Criteria

3.3.3 Thresholds and climate-aligned pathway for basic chemicals production

The following table outlines Paris-aligned emission reduction targets for key chemicals, ensuring that production processes transition towards low-carbon and renewable-energy solutions.

Table 12 **Emission intensity thresholds for basic chemicals**[46]

Basic chemical	2030 Target (tCO_2e per ton)	2040 Target (tCO_2e per ton)	2050 Target (tCO_2e per ton)
Ammonia	1.67/t H2 for the life cycle emissions of H2 used as feedstock	1.0/t H2 for the life cycle emissions of H2 used as feedstock	0.6/t H2 for the life cycle emissions of H2 used as feedstock
Nitric Acid	0.021	0.011	0.007
Chlorine	1.85 MWh/t	100% renewable electricity	100% renewable electricity
Methanol	1.67	1.0	0.6
Carbon Black	0.63	0.34	0.20
Soda Ash	0.44	0.23	0.14
High value chemicals (ethylene, propylene, butadiene)			
Aromatics BTX (benzene, xylene, toluene)	0.004	0.0021	0.0012

3.3.4 Case study: Nobian

Overview

Nobian, a leading European chemicals producer, issued a EUR525m (USD609m) sustainability-linked bond (SLB) on July 1, 2021, maturing on July 15, 2026. The bond incorporates a step-up mechanism of 25 basis points (bps), linking financial incentives to the achievement of climate targets. With total GHG emissions of 2,039 Kt CO_2e in 2021, Nobian is prioritising a transition to net-zero emissions by 2040 through electrification, renewable energy procurement, and efficiency improvements.

Key performance indicators (KPIs) and targets

Beyond the SLB, Nobian aims to reduce scope 1 and 2 emissions by 25% by 2025, 50% by 2030, and 100% by 2040, alongside a 50% Scope 3 reduction by 2040.

KPI	Target	Baseline (2020)	Target Year
GHG emissions (scope 1 and 2)	4% reduction	1,587 Kt CO_2e	2022
Renewable energy in operations	29% renewable energy share	N/A	2022

Key transition strategies

Nobian is reducing emissions through:

- **Electrification of processes** to phase out fossil fuels.
- **Renewable-energy procurement** to replace conventional power.
- **Energy efficiency improvements** across operations.

Governance and reporting

The company's board oversees climate strategy, supported by a dedicated sustainability team. All material KPIs are annually reported and independently assured.

Assessment

Nobian's **2025 and 2030 targets exceed Climate Bonds' Basic Chemicals pathway, classifying this SLB as 'Strongly-Aligned'.** However, the company must **accelerate scope 3 reductions** to fully align with net-zero goals. Nobian is on a clear decarbonisation trajectory, but deeper value chain engagement is crucial for continued leadership in sustainable finance.

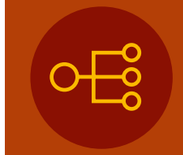
4 Corporate transition assessment

Financial institutions play a crucial role in accelerating the transition to a net-zero economy by directing capital toward companies with credible and ambitious decarbonisation strategies. However, assessing the maturity, ambition, and credibility of corporate transition plans remains a challenge. To address this, financial institutions need a structured methodology to categorise corporate transition efforts, enabling consistent tracking and effective capital allocation.

A recent study highlighted USD600bn 'addressable opportunities' for banks and financial institutions globally to fill a gap for financing and investment in the transition, with an annual USD44bn revenue opportunity through 2030 funding requirement for low-carbon transition.

- **Commitment and ambition:** Clear and science-aligned net-zero commitments.
- **Targets and delivery strategies:** Well-defined short-, medium-, and long-term emissions reduction targets with actionable decarbonisation levers.
- **Governance and implementation:** Strong board oversight, accountability, and integration into corporate strategy.
- **Performance monitoring:** Evidence of implementation, financial commitments, and emissions reductions.

Transition *Strategy* Toolkit to accelerate the pace and scale of transition finance



Climate Bonds, in collaboration with Capital Markets Malaysia (CMM), an affiliate of the Securities Commission Malaysia (SC), launched an interactive Transition Strategy Toolkit in April 2024, which is aimed at supporting efforts towards the global net-zero goal by leveraging transition finance amongst mature and mid-tier corporates. The toolkit is designed to offer corporations in ASEAN seeking to attract private capital for their transition needs with insights on building credible science-based climate transition plans that are aligned to the Paris Agreement or respective national climate targets.

For more information on the toolkit and the webinar, kindly refer to: https://www.capitalmarketsmalaysia.com/transition-strategy-toolkit/

Banks and financial institutions play a crucial role in financing the transition to a low-carbon economy in Vietnam. As part of its Transition Programme, Climate Bonds published Transition Finance Mapping: Frameworks to assess corporate transition in November 2023, and subsequently published its 'Navigating Corporate Transitions: a tool for financial institutions' report, which puts forward a classification system for corporate transitions that identifies:

- Five categories of corporate decarbonisation transition maturity; and
- Key indicators for a corporate's inclusion in each of those categories.

The core aim was to facilitate the rapid and ambitious transition of the real economy, and the achievement of the net-zero goals of financial institutions.

The need for a classification system for corporate transitions

Financial institutions, including banks, asset managers, pension funds, and insurance companies have set ambitious targets to decarbonise their portfolios under a range of initiatives, such as the Net Zero Banking Alliance (NZBA), Net Zero Asset Owners Alliance (NZAOA), Net Zero Asset Managers Initiative (NZAM), and Paris-Aligned Investment Initiative (PAII).

However, transitioning financial portfolios to net zero by 2050 requires financial institutions to align their capital allocation strategies with corporate transition efforts. In the absence of a standardised classification system, financial institutions face difficulties in distinguishing between companies with credible, science-aligned transition plans, from those with weak or misleading commitments. Financial institutions potentially encounter challenges in measuring progress and tracking the achievement of Paris-aligned corporate strategies, as well as decision-making vis-à-vis financing and risk aspects that balance climate commitments with business viability.

Transition *Finance* Mapping: Frameworks to assess corporate transition

Climate Bonds, in consultation with IIGCC, SMI, and funded by Climate Arc, has mapped the degree of alignment of 13 corporate transition frameworks. The initiative aims to guide institutional investors in analysing their investment portfolios on the path to net-zero emissions. In facilitating the allocation of capital to corporations at various stages of transition and promote the gradual decarbonisation of high-emission assets, this exercise also aims to foster consensus among existing corporate transition frameworks, ensuring a cohesive approach to sustainable finance.

For more information on the mapping analysis, kindly refer to: https://www.climatebonds.net/transition-finance/mapping

To navigate these complexities, financial institutions need a shared corporate transition classification framework that enables them to: (1) categorise companies based on their transition maturity and ambition; (2) provide a structured assessment methodology that is practical and scalable; and (3) guide capital allocation and engagement strategies for different transition stages.

A corporate transition classification system

The classification system presents a five-tier maturity scale for corporates based on the ambition and credibility of their transition plans. The categories reflect a company's progress toward a 1.5°C-aligned transition, moving from no action to fully aligned net-zero performance.

Table 13 **Transaction classification system**[49]

Category	Description	Key characteristics
5. Net Zero	Companies that have reached and maintained net-zero emissions.	- No reliance on offsets for scope 1 and 2. - Science-based emissions reduction aligned with a 1.5°C pathway. - Strong governance and transparent reporting.
4. Aligned	Companies with emissions that are currently on track with a 1.5°C sectoral pathway.	- No reliance on offsets for scope 1 and 2. - Short-, medium-, and long-term targets are all science-aligned. - Emissions reductions verified against credible benchmarks. - Implementation of a full set of decarbonisation levers.
3. Aligning	Companies that have developed a credible transition plan but have not yet achieved full alignment with a 1.5°C pathway.	- Short-term targets are aligned, but medium- and long-term targets are uncertain. - Active decarbonisation efforts but slower implementation. - Governance structures in place but limited external validation.
2. Committed	Companies that have made public commitments but lack clear implementation plans.	- Net-zero pledges without well-defined pathways. - Targets set but not necessarily science-based. - Some governance structures in place, but weak implementation.
1. No action	Companies with no transition plan or public commitment to decarbonisation.	- No emissions reduction targets. - No governance mechanisms in place for transition. - High transition risk and exposure to climate-related regulatory pressures.

Key assessment indicators

The classification system is anchored on five key indicators, which collectively determine the credibility and effectiveness of a company's transition plan.

Table 14 **Key indicators for assessing corporate transition plans**[50]

Indicator	Criteria for a strong transition plan
A. Commitment	- Public commitment to achieving net-zero aligned with a 1.5°C sectoral pathway. - No new investments in fossil fuel expansion.
B. Emissions targets	- Science-based short-, medium-, and long-term targets. - Comprehensive emissions inventory covering scope 1, 2, and 3.
C. Delivery strategy	- Clearly defined decarbonisation levers (e.g., electrification, CCS, circularity). - Feasible, economically viable, and measurable actions. - No overreliance on offsets.
D. Governance	- Board-level responsibility for transition strategy. - Defined climate-related financial planning and risk assessment.
E. Performance and implementation	- Annual progress tracking and third-party verification. - Corrective actions for missed targets. - Full alignment with science-based benchmarks.

These indicators provide a **structured framework for financial institutions** to evaluate whether a corporate entity is taking **genuine and actionable steps** toward decarbonisation.

The need for a classification system for corporate transitions

To effectively assess and determine the transition categorisation of the business activity of corporates, which may be at different stages of transition maturity, Climate Bonds proposes a three-step methodology to determine the overall categorisation at the corporate level.

1. Assign a point score to each category

0. Unclassified or 1. No action	**0 points**
2a. Committed - pledged	**1 point**
2b. Committed - short-term targets only	**2 points**
3a. Aligning – short-term+ plan	**4 point**
3b. Aligning – full plan	**6 points**
4. Aligned	**8 points**
5. Net zero	**10 points**

2. Assess each business activity separately to determine which transition category it falls into based on its compliance with the indicators for each category.

3. Calculate a weighted-average score for the corporate, weighting individual business activity category scores by either their share of the total revenue or emissions of the corporate, with the weighted-average score determining the category for the corporate.

To reinforce the credibility of corporate transition assessment, corporates are encouraged to leverage on the following guidance:
1. All indicators must be met; a corporate or its business activity must meet all indicators for a category to be classified in that category.
2. Annual (re)assessment is required; it is recommended that financial institutions reassess each corporate annually.
3. No timeframe is imposed for a corporate's speed of progress through the categories as a financial institution's own transition targets should reflect a movement of its corporate exposures up the transition categories over time at sector, product, and portfolio level.
4. Corporates may be reclassified downwards through the categories with reversal of a corporate's transition status if indicators that were formerly met are found not to be met after subsequent assessment.

A framework for action

The **Corporate Transition Classification System** provides a structured and scalable framework for financial institutions to assess corporate transition plans.

It enables financial institutions to:
- Differentiate credible corporate transitions from superficial commitments.
- Align capital allocation with climate-aligned business models.
- Manage transition risks and regulatory compliance effectively.

Key takeaways for financial institutions:
- **Use the classification system** to categorise corporate clients and investment portfolios.
- **Engage with companies in lower tiers (1–2) to push for credible transition plans.**
- **Prioritise capital allocation to companies in tiers 3–5, ensuring alignment with 1.5°C pathways.**
- **Develop sector-specific engagement strategies** for high-emission industries.
- **Integrate sustainability-linked finance instruments** to drive corporate accountability.

5 Financing the transition

Entities operating in sectors with well-established transition pathways, such as real estate, transportation, and utilities, can relatively easily identify projects, assets, and expenditures suitable for green (i.e., UoP) bond financing. For those operating in hard-to-abate sectors such as cement, steel, and chemicals, transition finance is needed to support rapid change in emission-intensive activities in these sectors, while helping to phase out environmentally harmful activities, such as the use of coal. This financing can comprise transition UoP bonds and/or performance-linked instruments such as SLBs and SLLs.

SLBs and SLLs are forward-looking, performance-based, general-purpose debt instruments issued with KPIs, and associated SPTs at the entity level. The activity of issuing a sustainable debt instrument, including an SLB or SLL, signals to investors that the issuing entity is identifying and addressing climate-related business risks.
A major advantage of sustainability-linked instruments where there are too few projects with environmental and social benefits to be able issue a UoP bond, is that a company can issue SLBs or SLLs instead. In terms of global best practices and guidance, the International Capital Market Association (ICMA) released the Sustainability-Linked Loan Principles (SLLP) in 2019 and the Sustainability-Linked Bond Principles (SLBP) in 2020. Additionally, the ASEAN Sustainability-Linked Bond Standards, were published by the ASEAN Capital Markets Forum in 2022.

“A major advantage of sustainability-linked instruments where there are too few projects with environmental and social benefits to be able issue a UoP bond, is that a company can issue SLBs or SLLs instead”

Climate Bonds sustainability-linked instrument-level guidance

To reinforce the credibility of sustainability-linked instruments, corporates and issuers are encouraged to leverage the following guidance:

- **Sustainability-linked instruments are only as powerful as the entity’s underlying transition plans.** Forward-looking sustainability-linked instruments should include KPIs with ambitious SPTs material to the main sources of emissions. The transition impact of such instruments is intrinsically linked to the credibility of the transition plan and ambition of associated performance targets.
- **Sustainability-linked instruments should include all material scopes of emissions.** Paris Agreement-aligned targets call for GHG targets, in the short-, mid-, and long-term; to be inclusive of scope 1, 2, and 3 and to be aligned with a science-based sector-specific pathway which will limit global warming to no more than 1.5°C.
- **Sustainability-linked instruments require robust emission targets and decarbonisation pathways.** The sustainability-linked instruments should utilise absolute GHG emission targets, science-based sector decarbonisation pathways, or GHG emission-intensity targets with a unit of production as the denominator.
- **Sustainability-linked instruments should have clear and consistent structures:** Climate Bonds encourages issuers to place first call-dates after the KPI observation date or include provisions in legal documentation that apply the coupon step-up if the bond is called before the KPI observation.

Sustainability-linked bonds: building a high-quality market

In collaboration with the Singapore Exchange (SGX), Climate Bonds published a report titled Sustainability-Linked Bonds: Building a High-Quality Market, which focused on sustainability-linked bonds (SLBs). It recommends the development and use of further guidance and rules for SLB structuring and disclosures, thereby facilitate issuance while creating clear, higher, and more consistent standards to assess deal quality.

Table 15 **Best practice checklist for SLB issuance**[51]

SLB element	Recommendations
Overall disclosure	• Align with SLBP and regional standards/principles if these exist and use Climate Bonds guidance. • Ensure disclosure covers all the information required.68 Make this available publicly and clearly.
GHG emission targets and alignment with SLBDB Methodology	• Meet the SLBDB alignment requirements, including providing public disclosure. • Include scope 3 if it is material. • Do not use economic intensity. • Align GHG targets with relevant science-based pathways. • Targets should be feasible as well as ambitious. If meeting the requirements for fully aligned SLBs is too ambitious, issuers can still use targets that are strong aligned or aligning. Full alignment is best, but all three categories are considered aligned. • For non-GHG KPIs, set targets aligned with relevant standards if these exist, and ensure substantial improvement versus the status quo.
Target and trigger dates	• Set target observation and trigger dates considerably before the bond's maturity. • Set trigger dates as soon as possible after observation dates.
KPI selection	• Link KPIs to relevant reporting standards and regulations and refer to ICMA's KPI Registry for consistency. Do not use ESG ratings/scores or other opaque KPIs. • Use at least one KPI related to climate mitigation, including absolute GHG emissions and GHG emissions production intensity where relevant. Include Scope 3 if material. (Not all bonds from the issuer must include this.) • Express KPIs and targets in absolute terms as well as production intensities. Do not use economic intensities (e.g., per unit of revenue). • KPIs related to an impact can differ in the short- versus long-term. For example, to address scope 3 emissions, issuers could set a short-term KPI/target to increase value chain engagement, plus a medium-term KPI/target for scope 3 emissions (when emissions are expected to fall). • Disclose methodologies to assess KPIs. • Regulators could enforce rules around KPI selection, possibly on a comply-or-explain basis at first. Materiality assessment guidance for each sector should be provided given region-specific contexts, with rules linked to this. Monitoring mechanisms should be implemented.
Multiple KPIs/ targets	• Use multiple KPIs to reflect different material impacts, including related to social dimensions (e.g., just transition). • Use multiple target dates for a given KPI to reflect different time horizons (can also help to spread risk). • Multiple targets are also encouraged to reflect different levels of ambition (with a single observation date). Combining step-ups with step-downs often makes sense in this case. • NB: not all of these must apply in each SLB. • Bonus tip: to increase transparency and impact attribution, issuers should consider using baseline years as close as possible to the issue date rather than baselines far in the past.
Call options and legal clauses	• Be transparent about call structures and legal clauses, and do not use them in bad faith. • Call dates should come after at least the first target and trigger date. If call dates precede target and/or trigger dates, the call price should reflect an assumption that the target has not been met (i.e., redemption premium). • Regulators and/or other market participants: monitor misuse of callable structures, especially in periods of falling interest rates which increase the incentive to exercise call options. Monitor the proportion of call options among SLBs, and especially the extent to which they are exercised. Legal clauses should also be monitored to ensure they are not used in bad faith.
Post-issuance SLB reporting	• Disclose reasons for changes in performance, including issuer's actions to improve performance: • Quantitative contributions for each reason are highly recommended where possible. • Corrective action plan if targets are missed. • Disclose restatements of data/performance and clearly explain their impact on baselines and targets. • Ensure consistent information across website, entity-level reports, and SLB documents. • Confirm that methodologies to calculate KPI performance disclosed at issuance remain valid, or provide updated methodologies.
Transition plan and link with SLBs	• Provide all relevant transition plan disclosure in one document or in a dedicated section of annual reports. • Display information clearly and sectioned in parts (e.g., following the elements of the Climate Bonds Standard). Downloadable data files are also useful. • Ensure disclosure is easy to reach on the issuer's website. • Clearly articulate the link between SLB issuance and transition plans, ensuring consistency. • Use guidance from Climate Bonds and others to ensure credibility and ambition of transition plans. The previous section covers examples of this along with a summary transition plan chart, but check CBS V4.2 (including Sector Criteria) for more detail.
Assurance	• Obtain external review at issuance (e.g., SPO, Climate Bonds Certification). • Post-issuance: - Minimum: assurance should cover at least KPI data (relevant to SLBs) at the target date. - Best practice: assure KPI performance annually before and after the target date, as well as the entirety of sustainability reporting (e.g., all KPIs and sustainability-related investments). Reasonable assurance can add reliability.

Issuing Thematic/ Labelled Bond Instruments in Vietnam	**In collaboration with IFC, Swiss State Secretariat for Economic Affairs, and the State Securities Commission of Vietnam, Climate Bonds published a handbook in 2021, on How-to Issue Guide for Green Bonds, Social Bonds and Sustainability Bonds in Vietnam, which guides corporates, potential issuers and other market players in applying thematic bond standards to mobilise resources from domestic and international capital markets for socio-environmental friendly and sustainable projects, including sustainability-linked and transition bonds.** **Banks and financial institutions in Vietnam can lever more green credit in Vietnam, in line with Decision No. 1663/QD-NHNN from the State Bank of Vietnam, issued in August 2024, which aims to facilitate access to green capital for green projects.** **In parallel, efforts by multilateral development banks such as ADB help support banks in Vietnam to facilitate more green lending activities and have the capacity to properly assess inherent climate change risks in their lending portfolios. This, coupled with Climate Bonds' participation, strengthens the banking sector's role in promoting green growth in Vietnam.**
Financing the Decarbonisation of China's Steel Industry: Technology, Policy and Instruments	**Climate Bonds recently published a report on Financing the Decarbonisation of China's Steel Industry: Technology, Policy, and Instruments, which encapsulated policy, technology, and market options and discussed how policies, Sector Criteria, and tools can support steel companies to finance low-carbon transitions and adopt deep decarbonisation technologies. It also explored levers to accelerate the decarbonisation of the steel sector, and describes how transition finance can supply the required capital. The report highlighted the need for coordinated efforts between industry, policymakers, investors, and civil society to incentivise the steel sector through increased understanding and use of trusted tools, such as the Climate Bonds Steel Criteria, alongside support from regulators and financial institutions to facilitate the acceleration of steel companies' deployment of low-carbon production.**

External review of transition finance instruments

A credible independent review and verification provides investors with assurance of the credentials of thematic instruments, such as SLBs and SLLs, with options including entity-level or instrument-level Certification against the Climate Bonds Standard, as well as a bespoke second-party opinion (SPO).

Issuing a credible sustainability-linked instrument requires careful consideration, planning, and execution to ensure its integrity and impact. By prioritising credibility and ambition, an entity can issue a sustainability-linked bond or loan that not only raises capital, but also demonstrates the sustainability commitment of the corporate.

Case study: Thematic instruments external review in Vietnam	**Climate Bonds continues to support the development of credible sustainable finance markets and works with a network of external reviewers and verifiers globally. In Vietnam, FiinRatings Joint Stock Company (FiinRatings) is a Climate Bonds local approved verifier since 2022.** **FiinRatings is established in Vietnam as an independent information and credit rating service provider, alongside an active advocate in promoting the development of sustainable finance in Vietnam, including its external review services for sustainability-linked and transition instruments.**

Appendix

A1. Additional criteria for carbon capture and storage, and carbon capture and utilisation

Utilisation of direct CO2 emissions from steel production is only eligible when the CO2 is used for the manufacture of durable products (e.g., construction materials stored in buildings, or recyclable products e.g., PET). CO2 should not be used for products that release the CO2 immediately when these are used (such as in urea, carbonated beverages, or fuels), nor for enhanced oil recovery, and the production of other forms of fossil energy sources. For carbon capture and storage., carbon capture equipment, both as an individual measure and as part of a whole facility being evaluated, is eligible so long as there is evidence that demonstrates the CO2 will be suitably transported and (if being stored and not utilised) stored in line with the criteria below:

Component	Requirements
Transport	1. The CO2 transported from the installation where it is captured to the injection point does not lead to CO2 leakages above 0.5 % of the mass of CO2 transported. 2. Appropriate leakage detection systems are applied, and a monitoring plan is in place, with the report verified by an independent third party.
Storage	1. Characterisation and assessment of the potential storage complex and surrounding area, or exploration is carried out in order to establish whether the geological formation is suitable for use as a CO2 storage site. 2. For operation of underground geological CO2 storage sites, including closure and post-closure obligations: a. appropriate leakage detection systems are implemented to prevent release during operation; b. a monitoring plan of the injection facilities, the storage complex, and, where appropriate, the surrounding environment is in place, with the regular reports checked by the competent national authority. 3. For the exploration and operation of storage sites, the activity complies with ISO 27914:2017225 for geological storage of CO2.

A2. Calculating the corrected facility level emissions according to cement class/grade

The facility shall test their product following EN 197-1 and report the value. Based on the cement grade produced (or the mass-weighted average strength grade produced where multiple grades are produced by a plant), the corresponding correction factor for that class should be applied to the facility's emissions intensity for that year.

If EN 197-1 is not used, applicants should use a corresponding nominal strength according to a locally used standard. Where multiple classes/grades are produced by a plant or entity, the mass-weighted average strength grade produced should be used to calculate the appropriate correction factor.

Where certification covers a new facility or group of facilities that do not yet know the mix of different cement products to be produced (for example, because clients have not yet specified), the correction factor for year 1 of certification can be set as 1. The applicant must then apply the appropriate correction factor no more than three years after production begins as part of the annual reporting for that year, in line with section 3.2.3.

Table 16 **Correction factors to determine the carbon intensity of the production**[55]

Cement Class	Expected Emissions (t CO_2e/t cementitious product)	Correction Factor
32.5	0.550	1.18
42.5	0.649	1.00
52.5	0.748	0.87

Worked example 1

One single cement grade produced on site

- A single facility produces cement of strength class 32.5 (correction factor of 1.18 per Table 5).
- The facility's emissions intensity is 0.416 t CO2/ t cementitious product.
- The corrected emissions intensity is 0.491 t CO2/t cementitious product (0.416 x 1.18). This is the number compared to the pathway thresholds.

Worked example 2

Multiple cement grades produced on site

A single facility produces several cement products of varying strength grades. In an example year, it produces 4000 tonnes of 42.5 cement, and 6000 tonnes of 52.5 cement.

- The weighted average grade is: ((42.5 x 4000) + (52.5 x 6000))/ (4000 + 6000) = 48.5, which is not an industry standard grade but is simply for the purposes of working out the expected emissions using the above linear relationship between cement class and emissions.
- This almost linear relationship above assumes that for every increase in megapascals by 1, emissions increase by 0.0099 t CO2/t cementitious product.
- The difference in emissions between 42.5 and 48.5 is: 0.0099 x 6 = 0.0594.
- The expected emissions of a 48.5 cement is: 0.649 + 0.0594 = 0.708t CO2/ t cementitious product.
- The conversion factor is thus 0.649/ 0.708 = 0.92.
- The facility's emissions intensity is 0.416t CO2/ t cementitious product.
- The corrected emissions intensity is therefore 0.383t CO2/t cement (0.416 * 0.92)

Endnotes

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6 One implication of this is that a company can be deemed to be credibly in transition while it is only making a small step change in the short term, if it has already, previously taken a large step change to decarbonise. In this case, it would effectively be continuing to deliver a 'low carbon' product or service, and so long as its future targets are aligned with overall decarbonisation targets for that sector. Conversely, a company that is making a large step change may still not be deemed to be making a credible transition if it is so far behind the curve that despite that large step change it still lags behind the transition pathway for the sector in which it operates.

7 ICMA SLB KPI Registry

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