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WHITE PAPER

Transition investing:

Measuring credibility

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Transition investing: Measuring credibility

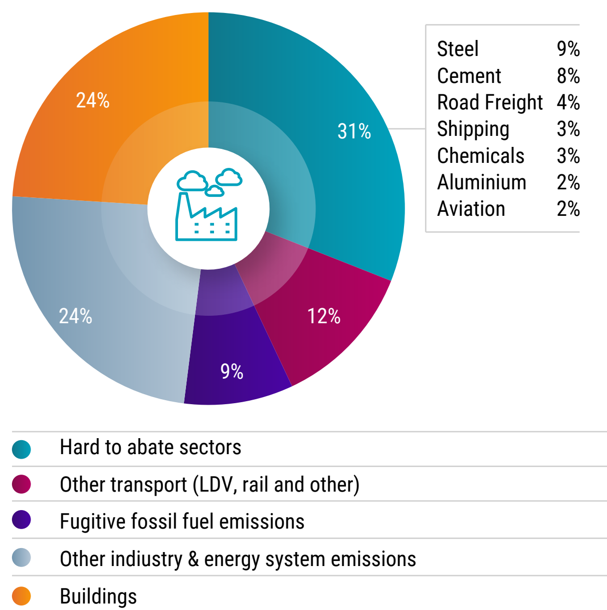
The goal of net zero emissions is said to be the greatest commercial opportunity of our time. We believe the best way to capture alpha from this opportunity is through an all-sector approach, with diversified exposure to companies that are providing low-carbon technologies, and also to heavy emitters whose ambitious decarbonization plans mean they are leading the transition in their industry.[1]

But how do we know whether companies are living up to the promise of decarbonization? How do we determine the credibility of investments in the climate transition? In this paper, we explain our approach to assessing company transition plans, including the repercussions on company capex and opex, and the implications for equity and bond investors. We pay special attention to the differences between emerging and developed markets.

Heavy Industry's Transition Investment Needs

The transition to net zero is underway, presenting significant investment opportunities, especially in heavy industries that face substantial challenges in reducing their carbon footprints due to their reliance on high-emission processes and technologies. According to the Intergovernmental Panel on Climate Change (IPCC), industry globally accounts for around 20 Gt of CO_2 equivalent[2] out of a total of 59 GT.[3] Hard-to-abate sectors are estimated to account for around 30% of total global greenhouse gas emissions (Figure 1), with cement and steel being major contributors, accounting for 13% of global emissions in 2022.[4]

Figure 1 – Hard-to-abate sectors are responsible for one-third of energy-related greenhouse gas emissions



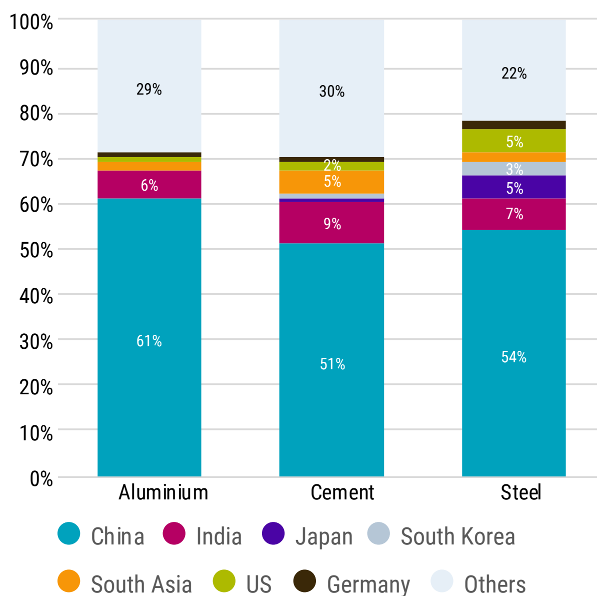
Source: Citi GPS, Mission Possible

1. See the whitepaper 'Transition investing: Exploring alpha potential' on the Robeco website.
2. Total anthropogenic direct and indirect GHG emissions (Direct emissions estimates assign emissions to the sector in which they arise (scope 1 reporting) Indirect emissions – as used here – refer to the reallocation of emissions from electricity and heat to the sector of final use (scope 2 reporting).
3. https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_TechnicalSummary.pdf
4. BNEF: Scaling Technology for greening heavy industry

The concentration of these emissions varies by sector and region, with heavy industry largely concentrated in high-activity areas like China and India. These sectors are crucial as their products are indispensable, and their transition to lower emissions requires substantial financial investments across several key areas such as technological innovation, the electrification of industrial processes, and through infrastructure investments. It has been estimated that capital investment requirements to achieve a zero-carbon economy will reach around USD 3 trillion a year by 2030, peaking at USD 4.5 trn in 2040, and averaging around USD 3.5 trn per annum over the next 30 years. This will be partly offset by a decline in the USD0.8 trn currently invested annually in fossil fuels, leaving an average net investment need of around USD 3 trn per annum to 2050. This includes investments in new technologies, infrastructure, and in the innovations necessary to achieve net-zero emissions.[5] Focusing on the hard-to-abate sectors, around USD 70 billion per year investment could be required on average between now and 2050.[6]

In this regard, emerging economies will need to invest about USD 2 trillion annually by 2030 to achieve the transition to net-zero emissions by 2050, according to the International Energy Agency.[7] This represents a fivefold increase from the current USD 400 billion of annual climate investments planned over the next seven years. Given the concentration of heavy industries in emerging markets (Figure 2), the need for transition finance will be more pronounced in these regions for hard-to-abate sectors. However, the regional financial action plan for decarbonization is currently inadequate. One of the main reasons for the low level of decarbonization finance in emerging markets is data gaps and data bias. A shortage of reliable data makes it difficult for potential investors to assess ESG compliance, or to demonstrate to regulators how ownership of an asset could impact their decarbonization profile.

Figure 2 – Global share of annual production by industrial materials and market



Source: World Steel, Cembureau, US Geological Survey, Polyglobe, Nexant ChemSystems, Bloomberg Terminal, BloombergNEF.
Note: Petrochemicals include high-value chemicals such as ethylene, propylene and aromatics. Petrochemicals data is for 2021. Production data for all other materials is for 2022

Despite these challenges, there are opportunities for investors, particularly in hard-to-abate sectors, to act as catalysts for investments into innovative solutions and sustainable energy infrastructure. Supporting the transformation of these essential industries is not only crucial for environmental sustainability, but is also a strategic move that promises substantial economic returns, long-term resilience and alpha generation opportunities. Transition finance plays a pivotal role in this context, channeling financial resources into activities that help firms make meaningful progress toward decarbonization.[8]

5. https://www.energy-transitions.org/publications/financing-the-transition-etc/
6. Financing the Transition: How to Make the Money Flow for a Net-Zero Economy
7. https://www.imf.org/en/Blogs/Articles/2023/10/02/emerging-economies-need-much-more-private-financing-for-climate-transition
8. In this article, we focus on the transition finance of carbon-intensive sectors, particularly hard-to-abate industries. While we recognize the importance of solution providers, we have not dedicated on these sectors and companies, as their decarbonization potential and alpha generation opportunities are thoroughly discussed in Robeco's recent publication, "Transition Investing: Exploring Alpha Potential".

Assessing the credibility of company transition plans

Transition finance, due to varying definitions and a lack of consensus, risks exacerbating greenwashing concerns. While frameworks aim to harmonize the market, the concept of transition varies by sector and geography, leading to a lack of agreement. Critics point out the lack of standardization and reputational risks for issuers, as transition finance often supports interim steps rather than long-term goals, potentially allowing heavy emitters to maintain the status quo or make only marginal improvements. Therefore, transition finance must be credible and sector specific to support decarbonization effectively. Credibility depends on rigorous assessments that evaluate the impact and viability of financed activities, including a detailed analysis of a company's carbon footprint, decarbonization targets and transition strategies, taking into account the characteristics of the respective sector. These assessments must ensure funds are used for genuine transition efforts rather than superficial improvements.

Each sector faces unique challenges, opportunities and timelines in decarbonizing their operations. A one-size-fits-all approach to transition planning is often inadequate, as what works well for one industry may not be suitable for another. Therefore, the development of standardized guidelines that take into account the specific requirements and nuances of different sectors is crucial to ensure effective and meaningful decarbonization efforts. By offering sector-specific transition plan guidance within a global framework, industries can benefit from best practices, benchmarks, and tailored strategies that align with their operational realities. These guidelines help companies set realistic goals, implement actionable steps and track progress towards sustainability targets in a way that is relevant and impactful for their sector.

Robeco's Sector Decarbonization Pathway (SDP) is a reliable, scientifically-backed framework essential for identifying transition companies through a fundamental approach. The SDP model tracks the current and future decarbonization trajectories of companies against science-backed, sector-specific benchmarks. It also assesses their capex in emission-reducing technologies and the impact of future market dynamics and policy. This comprehensive approach helps us define a concrete picture of how companies' financial performance will evolve as decarbonization trends intensify. The model's analysis feeds into Robeco's Traffic Light Assessment which calculates the level of alignment of companies with the Paris Agreement goals.[9] This in turn helps inform fundamental analysis and portfolio management decisions of Robeco's investment teams across asset classes.
The SDP model uses the Transition Pathway Initiative (TPI) below-2 °C pathway as the industry decarbonization benchmark. This pathway charts the annual reductions required for sectors to keep global temperatures well below the 2 °C limit stipulated in the Paris Agreement by 2050. Additionally, the model creates a year-by-year decarbonization trajectory by combining the company's past carbon emissions performance with its future emission targets. Gaps between company targets and the benchmark indicate transition risk – the larger the gap, the greater the risk. The results enable investors to value the transition risk of companies and adapt their portfolios according to their risk-return objectives.

For example, the pathway for the cement sector (see Figure 3) remains stable until 2030 before gradually decreasing. This indicates that significant decarbonization in the sector is unlikely by 2030, due to the current lack of cost-competitive low-carbon solutions. Consequently, our in-house SDP enables our analysts to assess risks and opportunities based on sector-specific characteristics. By analysing the sector pathway and a company's position relative to its sector, we can estimate whether decarbonization efforts have been factored into the company's valuation, if the company is transitioning, or whether we should expect more investment in decarbonization in the future.

9. See the article 'It takes the right metrics to engineer a Paris-aligned portfolio' on the Robeco website.

Figure 3 – Robeco's sector decarbonization pathway

Not all countries and regions will follow the same decarbonization path due to differences in policy, governance, economic constraints, technological gaps, fossil fuel dependency, development priorities and limitations in international assistance. EM countries may diverge from the paths of DM countries. To address these differences, we have initiated the development of region-specific SDPs for five key sectors: steel, cement, oil & gas, power and financials, aligning them with each country's Nationally Determined Contributions (NDC) targets rather than global scenarios.

The rationale behind selecting steel and cement lies in the fact that these hard-to-abate sectors are primarily concentrated in EM countries, where mature and cost-competitive decarbonization technologies are not yet available. Regarding the power and oil & gas sectors, the need for substantial financing – often sourced from governments – necessitates alignment with national policies to achieve decarbonization goals. The financials sector is pivotal as it underpins the financing of all other sectors, making its decarbonization strategies critical for supporting broader sectoral transitions. This approach allocates a fair share of responsibilities to EM companies and recognizes that pathways to decarbonization are influenced by each economy's state and legacy investments in infrastructure. It also highlights that carbon-intensive sectors do not operate in isolation, ensuring a more holistic and fair evaluation of each region's efforts towards sustainable development.

Figure 4 – Robeco regionally adjusted Sector Decarbonization Pathway

Robeco's regional Sector Decarbonization Pathways provide a more nuanced exploration of both the technical potential and the socio-economic benefits of the transition at the regional level. Drawing on analyses of countries energy mix, power mix, EV penetration, and countries targets and capacities, they serve as the basis for informed development strategies and strengthened regional cooperation to both accelerate the progress toward, and maximize the benefits from, the global transition to a low-carbon economy.

Since companies' targets and commitments are not always credible, we need verification. Therefore, we verify companies' decarbonization targets and commitments using the six credibility elements in Robeco's Traffic Light Assessment (see figure 4). Among these, capital alignment is the most critical factor in assessing the risks and opportunities for companies, especially in high carbon-intensive sectors that require substantial financing for transition. Capex is crucial for decarbonization, as it signals a company's commitment, manages regulatory and operational risks, fosters long-term value creation, and future-proofs the business against the obsolescence of carbon-intensive assets. Aligning capex with decarbonization targets is a robust method for validating a company's decarbonization plan. To support this, Robeco places significant emphasis on capex and has developed its own cost abatement model to further evaluate the alignment of companies' capex with their decarbonization targets.

Zooming in on capex and opex

Measuring the gaps between company pathways and benchmark targets is just one part of assessing transition risk; it doesn't tell the full story. For this reason, we analyse companies' abatement costs including future capital expenditures on carbon-reducing technologies to get a more robust read on their true intentions. Although many decarbonizing technologies are under development, at present, we only focus on those that are commercially ready. Companies may set ambitious targets, but whether they are truly committed and financially capable of fulfilling those targets will be revealed by the cost abatement analysis. Our cost abatement tool evaluates the gap between a company's reported capex and the investment needed to achieve benchmark carbon intensity reductions. Negative gaps between actual and benchmark-required capex show companies are not investing enough and are expected to miss targets. Adopting technologies may also result in higher ongoing operational expenditure, such as automobile battery outsourcing or renewable energy purchasing. In addition to credibility, capex and opex assessments offer a way of evaluating just how costly it will be to align with the industry benchmark and reduce transition risks. Below are three examples from the steel and aluminium sectors

Figure 5 – Robeco Traffic Light

Steel company A

To reach its 2030 target of a 34% emission intensity reduction compared to 2022 (2.025 tonne CO2/tonne steel), a European-based steel producer intends to decarbonize 50% of its operations via the use of direct reduced iron+ electric arc furnace, and 50% via the blast furnace + carbon capture storage technology route. The company committed EUR 10 bln of capex by 2030. Based on these technologies, the SDP model estimates an abatement cost of EUR 15 bln to meet the 2030 targets. This capex is insufficient per our model, and the company still has 51% capex gap to reach its decarbonization target.

Steel company B

Steel company B has its operations in South America. The company has set a target to reduce operational emissions by 20% by 2030, compared to a 2018 baseline (1.7 tonne CO2/tonne steel). The company has decided to reduce its emissions by employing entirely the route of direct reduced iron + electric arc furnace. The company has committed USD 2.9 bln in capex to meet these targets, of which 2.4 bln have already been invested. Based on these inputs, with the SDP model we estimate the company should invest around USD 2.7bn. This shows that in our view the company has pledged sufficient capex to decarbonization.

Aluminium company C

European aluminium company C has set targets to reduce its operational emission intensity by 30% by 2030, against a 2018 baseline (4.65 tonne CO2/tonne aluminium). We expect the company to meet this target by adopting in parallel a mix of technologies to decarbonize the different steps of the aluminium production process. Given that the company in 2022 already sourced 48% of its electricity from renewable energy, then based on our assumption on the costs of decarbonizing technologies, we estimate that the company will have to invest approximately EUR 740 mln in capex by 2030 to meet the 30% decarbonization target.

Even though the company does not explicitly report the planned capex dedicated to decarbonizing its operations, it has reported guidance to invest approximately EUR 650 mln annually in its bauxite mining, alumina refining and aluminium production operations. Given that many of the investments that have been disclosed are specifically aimed at reducing emissions, we assume that the investments will be sufficient to meet the company's decarbonization goal and forecast no capex gap.

Figure 6 – Robeco's cost abatement model

	2030 reduction target vs. baseline	Estimated required capex target	Reported committed capex	Capex gap target
Steel Company A	-34%	EUR 20.5 bln	EUR 10 bln	-51%
Steel Company B	-22%	USD 2.7 bln	USD 2.9 bln	+7.4%
Aluminium Company C	-30%	EUR 740 mln	EUR 650 mln annually for all bauxite, alumina, and aluminium operations.	We assume share dedicated to decarbonization will be sufficient and estimate no capex gap.

Capturing alpha opportunities

For investors, companies in heavy industries with credible decarbonization plans could present significant opportunities. As these industries undergo transformation, they open avenues for innovation, technological advancement and financial growth. Investing in companies that are committed to decarbonization can yield sustainable returns, particularly as regulatory pressures and market demands for sustainability increase, so that less-prepared companies will eventually see their performance lag.

Incorporating these factors into a valuation model can help investors identify undervalued opportunities and assess potential risks, ensuring better-informed decisions by considering the long-term benefits of sustainability initiatives and potential regulatory impacts. Alpha generation – or the ability to achieve excess risk-adjusted returns – is possible through strategic investments in firms that are ahead in their decarbonization efforts. These companies are likely to benefit from increased efficiency, enhanced reputation, and compliance with future regulations, making them attractive investment prospects.

The financial implications of decarbonization investments vary between fixed income and equity investors. High capex requirements for decarbonization are perceived differently depending on the investment perspective. For equity investors, significant decarbonization capex that enable the manufacturing of climate solution/adoption products can indicate a company's proactive stance towards sustainability, potentially contributing to long-term growth and higher returns. This proactive approach can enhance the company's market position and drive innovation, making it an appealing investment. For fixed income investors, decarbonization efforts can improve companies' financial standing by lowering yields, reflecting reduced tax and regulatory risks and increased investor demand, thereby enhancing the company's market position.

However, high decarbonization capex might be viewed as a risk for some sectors because substantial capital expenditures can increase debt ratios, potentially impacting the company's creditworthiness and ability to meet its debt obligations. High levels of debt can strain a company's financial stability, making its bonds less attractive to conservative fixed income investors who prioritize steady returns and lower risk. A selective approach is required to differentiate between issuers, favouring those where equity injections are likely to support growth capex and protect credit quality.
In conclusion, decarbonization and transition finance in heavy industries offer substantial opportunities for both equity and fixed income investors. The key is to assess the financial implications of these investments within the context of the company's overall strategy and market position. By carefully evaluating the cost related to decarbonization, investors can identify companies that not only contribute to a sustainable future but also promise attractive returns, thereby achieving both environmental and financial goals.

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information the Fund provides to its investors and the other services it provides to them are the sole responsibility of the Administrator. This Prospectus is not for public distribution.

Additional information for investors with residence or seat in Singapore
This document has not been registered with the Monetary Authority of Singapore ("MAS"). Accordingly, this document may not be circulated or distributed directly or indirectly to persons in Singapore other than (i) to an institutional investor under Section 304 of the SFA, (ii) to a relevant person pursuant to Section 305(1), or any person pursuant to Section 305(2), and in accordance with the conditions specified in Section 305, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA. The contents of this document have not been reviewed by the MAS. Any decision to participate in the Fund should be made only after reviewing the sections regarding investment considerations, conflicts of interest, risk factors and the relevant Singapore selling restrictions (as described in the section entitled "Important information for Singapore Investors") contained in the prospectus. Investors should consult their professional adviser if you are in doubt about the stringent restrictions applicable to the use of this document, regulatory status of the Fund, applicable regulatory protection, associated risks and suitability of the Fund to your objectives. Investors should note that only the Sub-Funds listed in the appendix to the section entitled "Important information for Singapore Investors" of the prospectus ("Sub-Funds") are available to Singapore investors. The Sub-Funds are notified as restricted foreign schemes under the Securities and Futures Act, Chapter 289 of Singapore ("SFA") and invoke the exemptions from compliance with prospectus registration requirements pursuant to the exemptions under Section 304 and Section 305 of the SFA. The Sub-Funds are not authorized or recognized by the MAS and shares in the Sub-Funds are not allowed to be offered to the retail public in Singapore. The prospectus of the Fund is not a prospectus as defined in the SFA. Accordingly, statutory liability under the SFA in relation to the content of prospectuses does not apply. The Sub-Funds may only be promoted exclusively to persons who are sufficiently experienced and sophisticated to understand the risks involved in investing in such schemes, and who satisfy certain other criteria provided under Section 304, Section 305 or any other applicable provision of the SFA and the subsidiary legislation enacted thereunder. You should consider carefully whether the investment is suitable for you. Robeco Singapore Private Limited holds a capital markets services license for fund management issued by the MAS and is subject to certain clientele restrictions under such license.

Additional information for investors with residence or seat in Spain
Robeco Institutional Asset Management B.V., Sucursal en España with identification number W0032687F and having its registered office in Madrid at Calle Serrano 47-14º, is registered with the Spanish Commercial Registry in Madrid, in volume 19.957, page 190, section 8, sheet M-351927 and with the National Securities Market Commission (CNMV) in the Official Register of branches of European investment services companies, under number 24. The investment funds or SICAV mentioned in this document are regulated by the corresponding authorities of their country of origin and are registered in the Special Registry of the CNMV of Foreign Collective Investment Institutions marketed in Spain.

ROBECO

Additional information for investors with residence or seat in South Africa
Robeco Institutional Asset Management B.V. is registered and regulated by the Financial Sector Conduct Authority in South Africa.

Additional information for investors with residence or seat in Switzerland
The Fund(s) are domiciled in Luxembourg. This document is exclusively distributed in Switzerland to qualified investors as defined in the Swiss Collective Investment Schemes Act (CISA). This material is distributed by Robeco Switzerland Ltd, postal address: Josefstrasse 218, 8005 Zurich. ACOLIN Fund Services AG, postal address: Leutschenbachstrasse 50, 8050 Zürich, acts as the Swiss representative of the Fund(s). UBS Switzerland AG, Bahnhofstrasse 45, 8001 Zurich, postal address: Europastrasse 2, P.O. Box, CH-8152 Opfikon, acts as the Swiss paying agent. The prospectus, the Key Information Documents (PRIIP), the articles of association, the annual and semi-annual reports of the Fund(s), as well as the list of the purchases and sales which the Fund(s) has undertaken during the financial year, may be obtained, on simple request and free of charge, at the office of the Swiss representative ACOLIN Fund Services AG. The prospectuses are also available via the website.

Additional information for investors with residence or seat in Taiwan
The contents of this document have not been reviewed by any regulatory authority in Hong Kong. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. This document has been distributed by Robeco Hong Kong Limited ("Robeco"). Robeco is regulated by the Securities and Futures Commission in Hong Kong.

Additional information for investors with residence or seat in Thailand
The Prospectus has not been approved by the Securities and Exchange Commission which takes no responsibility for its contents. No offer to the public to purchase the Shares will be made in Thailand and the Prospectus is intended to be read by the addressee only and must not be passed to, issued to, or shown to the public generally.

Additional information for investors with residence or seat in the United Arab Emirates
Some Funds referred to in this marketing material have been registered with the UAE Securities and Commodities Authority ("the Authority"). Details of all Registered Funds can be found on the Authority's website. The Authority assumes no liability for the accuracy of the information set out in this material/document, nor for the failure of any persons engaged in the investment Fund in performing their duties and responsibilities.

Additional information for investors with residence or seat in the United Kingdom
Robeco Institutional Asset Management B.V (FRN: 977582) is authorised and regulated by the Financial Conduct Authority.

Additional information for investors with residence or seat in Uruguay
The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except under circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated 27 September 1996, as amended.

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