

# MSCI Implied Temperature Rise Model Update

February 2024



# Overview and key highlights

MSCI's Implied Temperature Rise (ITR) metric gives a global warming temperature value to a scenario where the global economy over- or underspends its remaining carbon budget like the company or portfolio in question. The metric, which evolves over time, is designed to help investors understand the alignment of companies and portfolios with global climate goals.

MSCI ESG Research recently implemented a series of enhancements to our ITR model based on a consultation with clients and the latest guidance for measuring portfolio alignment published by the Glasgow Financial Alliance for Net Zero (GFANZ).<sup>1</sup> In particular, the updated model includes sector-specific pathways for limiting global warming to 1.5°C and a credibility assessment of corporate decarbonization targets to deliver a clearer view of climate progress.

The information that follows summarizes the enhancements. The goal is to help clients compare the updated model with the previous model. Additional educational materials are available on our Client Support Site.

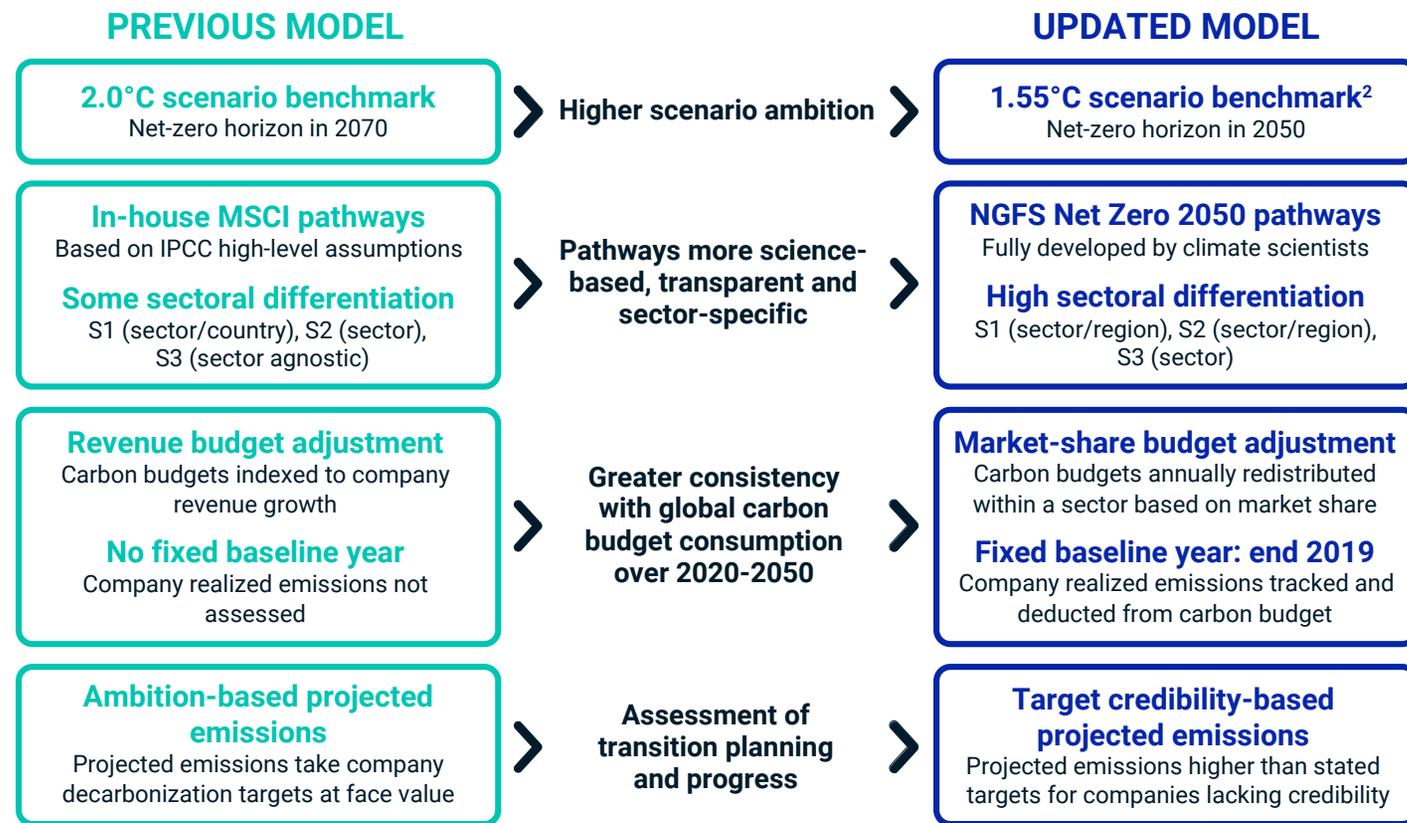
<sup>1</sup>"Measuring Portfolio Alignment: Driving Enhancement, Convergence, and Adoption." GFANZ, November 2022.



# High-level overview of enhancements

MSCI's updated ITR model introduces a series of new features (Exhibit 1). Significantly, the metric now aims to align with sector-specific 1.5°C decarbonization pathways and brings the time for reaching net-zero forward to 2050 from 2070. The model weighs the credibility of corporate climate targets and fine tunes the calculation of companies' remaining carbon budgets.

**Exhibit 1: MSCI's updated ITR model introduces a series of enhancements**



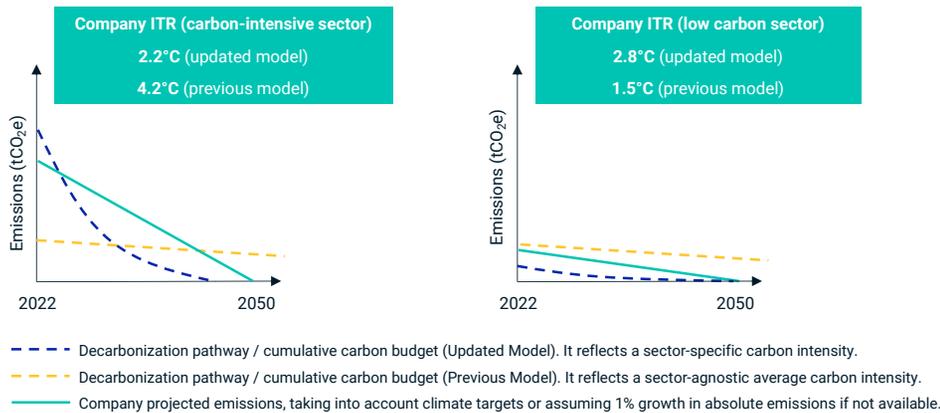
Source: MSCI ESG Research

<sup>2</sup>Strictly speaking, data for the NGFS pathways adds up to global warming of 1.55°C by the year 2100. MSCI ESG Research uses 1.5°C as shorthand throughout this document, the same way that NGFS refers to the pathways in its publications.

The updated model's differentiation of net-zero pathways by sector has a significant impact on ITR outputs. The model now benchmarks Scope 3 emissions relative to specific sectors. It compares emissions coming from a cement company's value chain, for example, with the Scope 3 emissions of companies in the cement sector.<sup>3</sup>

Note also that the relatively high ITR of a company in a carbon-intensive sector such as energy (an oil and gas company, for example) under the previous model may decrease substantially when the company's Scope 3 emissions are benchmarked against a pathway that better reflects the emissions intensity of the sector (Exhibit 2). The opposite may happen too: The ITR of a company in a less carbon-intensive sector (a technology company, for example) may increase as the company's Scope 3 emissions are compared to a more stringent Scope 3 pathway, reflecting the comparatively low fair share of the global carbon budget that should correspond to the least carbon-intensive sectors.

### Exhibit 2: Stylized illustration of the impact of sector-specific pathways



Source: MSCI ESG Research. This is an illustration, which does not show actual company data.

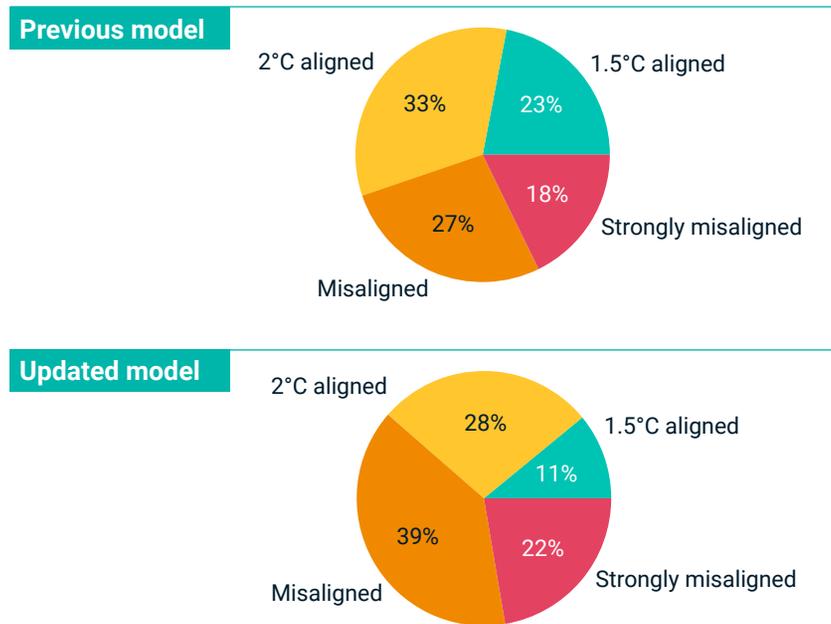


<sup>3</sup>Sectors as defined in the ITR model reflect the MSCI emissions sectors classification.

# Comparing impacts between the previous and updated ITR models

While the combined impacts of changes to the ITR model varies by company, in the aggregate the number of the world's listed companies that align with the Paris Agreement's temperature thresholds will be lower with the updated ITR model than under the previous model (Exhibit 3).<sup>4</sup>

**Exhibit 3: Alignment of listed companies with key climate thresholds**

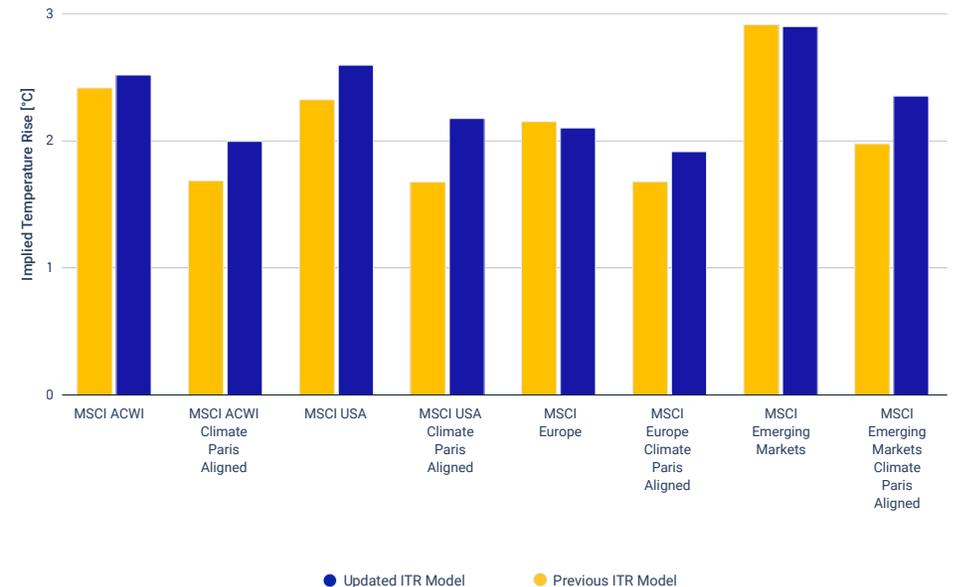


Source: MSCI ESG Research. MSCI ACWI IMI and ITR data as of January 2024, data for updated model is simulated.

<sup>4</sup>Represented by the MSCI ACWI Investable Market Index (ACWI IMI), which includes large-, mid- and small-cap listed companies across 23 developed market and 27 emerging market countries. With 9,152 constituents, the index covers approximately 99% of the global equity investment opportunity set, as of Aug. 31, 2023. The previous and updated ITR data is as of January 2024.

Taken together, MSCI indexes align under the updated model with warmer estimated temperatures due mainly to the more stringent parameters, including the credibility assessment of corporate climate targets included in the enhancements (Exhibit 4). Note that MSCI's Climate Paris Aligned Indexes continue to align with warming of around 2°C or less in both models.

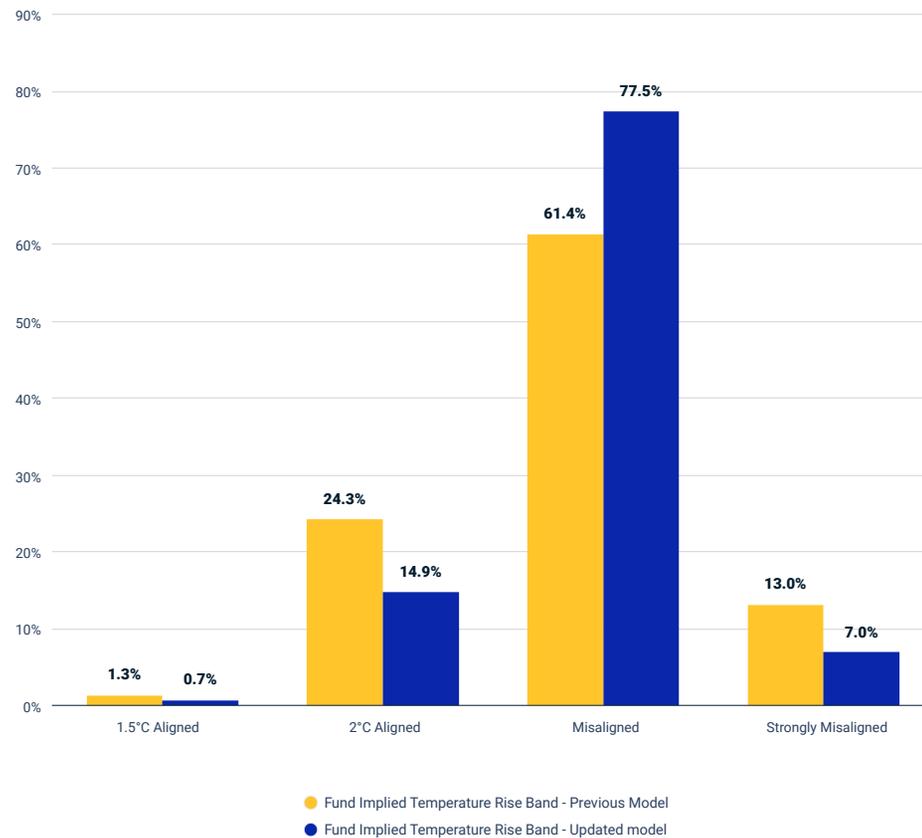
**Exhibit 4: MSCI Indexes align with warmer estimated temperatures under the updated ITR model**



Source: MSCI ESG Research. MSCI Index data and ITR data as of January 2024, data for updated model is simulated.

We also observe warmer estimated temperatures for the majority of funds. 84.5% of funds are now Misaligned and Strongly Misaligned (vs 74.5% previously), the share of 1.5°C or 2°C aligned funds decreased from 25.6% to 15.6% of funds (Exhibit 5).

**Exhibit 5: Distribution of Fund Implied Temperature Rise Bands**

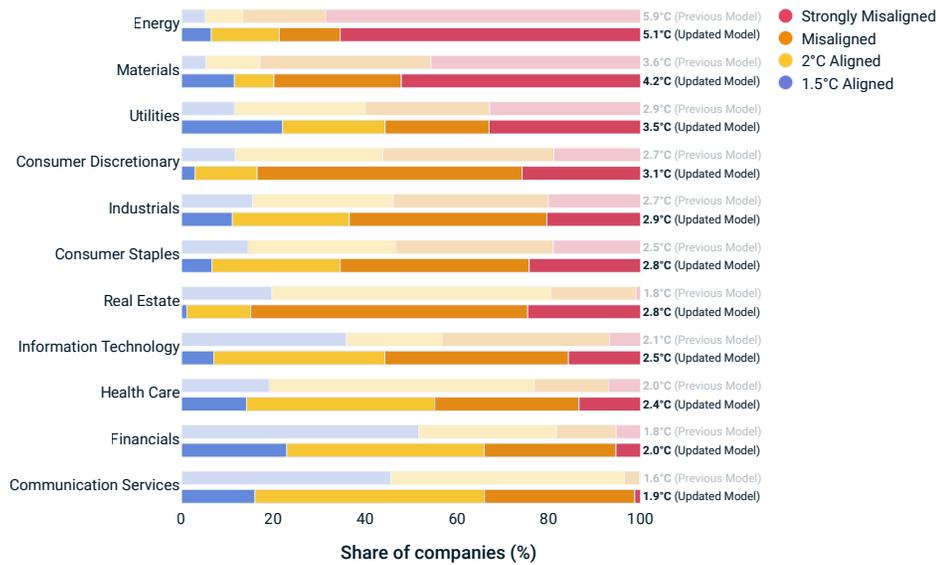


Source: MSCI ESG Research. Fund and ITR data as of December 2023, data for updated model is simulated.



The estimated temperature alignment of sectors changes under the updated model as well (Exhibit 6). The ITR of the emissions-intensive energy sector falls by eight-tenths of a degree, for example, highlighting the impact of the model's sector-specific pathways discussed above. Sectors such as information technology and utilities, meanwhile, warm by four-tenths of a degree apiece, while the real-estate sector warms by a full degree.

### Exhibit 6: Changes in ITR and alignment with key thresholds by GICS® sector



Source: MSCI ESG Research. MSCI AWI IMI data as of August 2023. ITR data as of November 2023, data for updated model is simulated. Sectors from the Global Industry Classification Standard (GICS®) jointly developed by MSCI Inc. and S&P Global Market Intelligence. The GICS® structure comprises 11 sectors, 24 industry groups, 69 industries and 158 sub-industries.

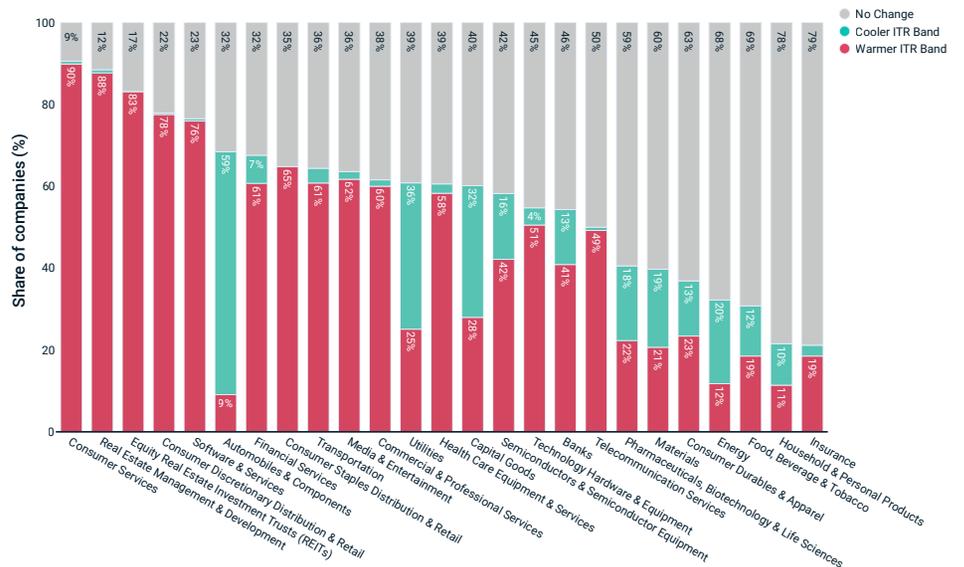


The dispersion of temperature alignment within sectors also changes. Our ITR model classifies warming by temperature range:

- 1.5°C aligned: <=1.5°C
- 2°C aligned: > 1.5°C – 2.0°C
- Misaligned: > 2.0°C – 3.2°C
- Strongly misaligned: > 3.2°C

Note, for example, the changes by warming band in both the real estate and utilities sectors. The extent of change within industry groups also varies (Exhibit 7). While the distribution in some, such as insurance, changes little, the distribution in others, such as transportation, gets much hotter.

### Exhibit 7: Proportion of changes in ITR band classification by GICS® industry group



Source: ESG ESG Research. MSCI ACWI IMI data as of January 2024. ITR data as of January 2024, data for updated model is simulated.



## Summary explanation of changes based on model updates

Changes in ITR within sectors reflect the introduction of sector-specific Scope 3 decarbonization pathways.

- The updated model uses open-source 1.5°C decarbonization pathways provided by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS).<sup>5</sup> The pathways stand in contrast with the blunt, straight line we used in our previous model, which starts from a single, sector-agnostic Scope 3 average intensity across the world's listed companies and ends at net-zero by 2070.
- The change means that companies will be benchmarked to a net-zero pathway that reflects the carbon intensity of their sector.<sup>6</sup> Hence, companies in more emissions-intensive sectors will now receive a larger carbon budget than they did in the previous model. That allows such companies to have a bigger budget for value-chain (Scope 3) emissions, for example, and, consequently, a lower ITR, all other parameters equal (Exhibit 2).
- Companies in less emissions-intensive sectors will now receive a smaller carbon budget, resulting in an increase in their sectoral ITR compared with the previous model.

The introduction of Scope 2 decarbonization pathways derived from the REMIND NGFS Net Zero 2050 scenario (covering emissions from purchased electricity) results in a significantly higher share of "strongly misaligned" Scope 2-level ITRs across sectors.

- The change reflects the reality that utilities, on average, would need to reduce emissions further and faster if they are to align with the NGFS 1.5°C-aligned pathway for electricity decarbonization.

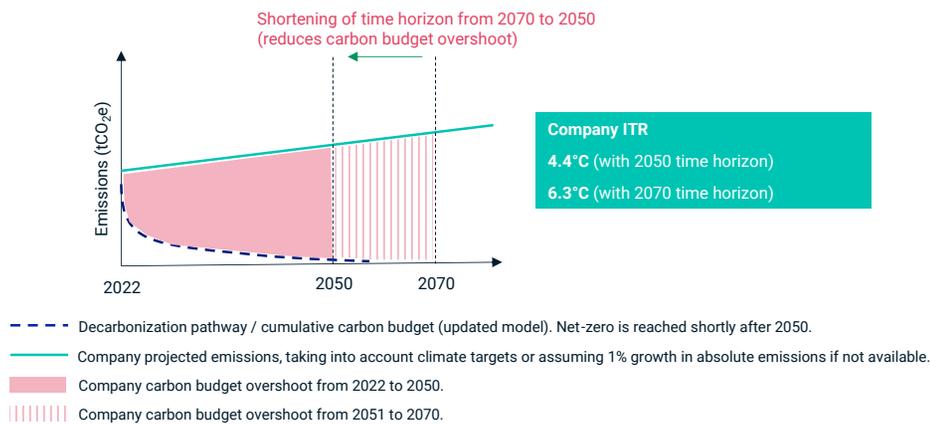
<sup>5</sup> The updated model uses the REMIND NGFS Net-Zero 2050 scenario. See "NGFS Climate Scenarios for central banks and supervisors." NGFS, Sept. 6, 2022.

<sup>6</sup> Each sectoral pathway starts from an average carbon intensity for the relevant MSCI emissions sector as of late 2019, computed by MSCI ESG Research.

The updated model's bringing forward to 2050 from 2070 the time horizon for reaching net-zero reduces the cumulative carbon budget available to companies, as well as their cumulative projected emissions (Exhibit 8).

- The updated model counts projected emissions until 2050, compared with 2070 under the previous model. That may result in less overshoot (and hence lower ITR) for companies with weak or no climate targets. For such companies a significant amount of projected emissions above budget (those projected to occur between 2051 and 2070) will now be dismissed.

### Exhibit 8: Stylized representation of time-horizon shortening's impact on a misaligned company



MSCI ESG Research. This is an illustration, which does not show actual company data.

The updated model subtracts from each company's remaining carbon budget the estimated quantity of greenhouse gases emitted by the company in the prior year.

- The budget rollover introduces a backward-looking component: The updated model deducts company's realized emissions annually since 2020 from the company's initial net-zero-aligned carbon budget.
- For companies that have emitted significantly more than prescribed by their

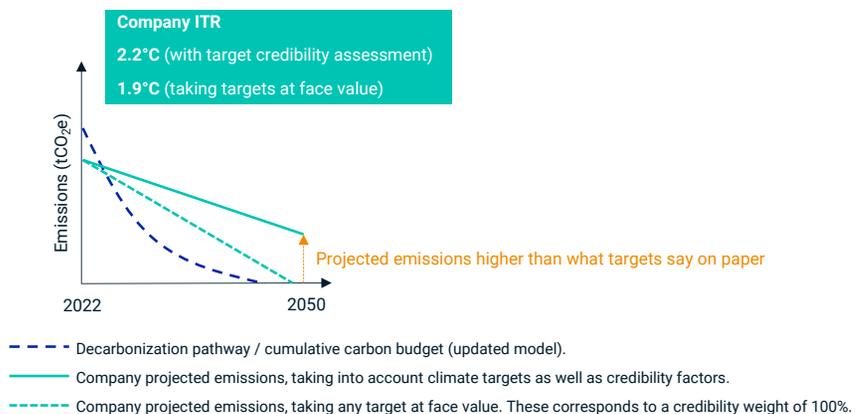
decarbonization pathways, updated company budgets lead to higher ITRs, all other parameters equal. The change impacts the real estate sector, for example, where companies' emissions in 2020 and 2021 consumed an outside share of their emissions budget compared with other sectors; the rollover reduces what for real estate companies is a much lower Scope 3 emissions budget (resulting from a more stringent Scope 3 pathway) in the updated model compared with the previous one.

- For companies that have emitted significantly less than the benchmark, updated company budgets lead to lower ITRs, all other parameters equal.

The target credibility assessment added in the updated model contributes to higher projected emissions – and therefore higher ITRs – for companies that have published climate targets but lack transition-planning credibility, according to key indicators (Exhibit 9).

- Though this feature impacts all sectors, it has a lesser impact overall than the model changes listed above. This is expected; our credibility assessment adjusts the company's stated decarbonization trajectory within a reasonable range. At worst, the emissions of companies whose targets lack credibility would be projected to grow at 1% a year.

### Exhibit 9: Illustration of target credibility assessment



MSCI ESG Research. This is an illustration, which does not show actual company data.

# Interpreting ITR outputs

The ITR model describes how companies manage their fair share of a carbon budget designed to limit global warming. The updated model reinforces the sector-specific definition of fair share, using open-source 1.5°C pathways developed by the NGFS. That contrasts with the previous model, which assessed companies against the same, sector-agnostic Scope 3 decarbonization pathway, penalizing companies in carbon-intensive sectors and rewarding companies in less carbon-intensive ones.

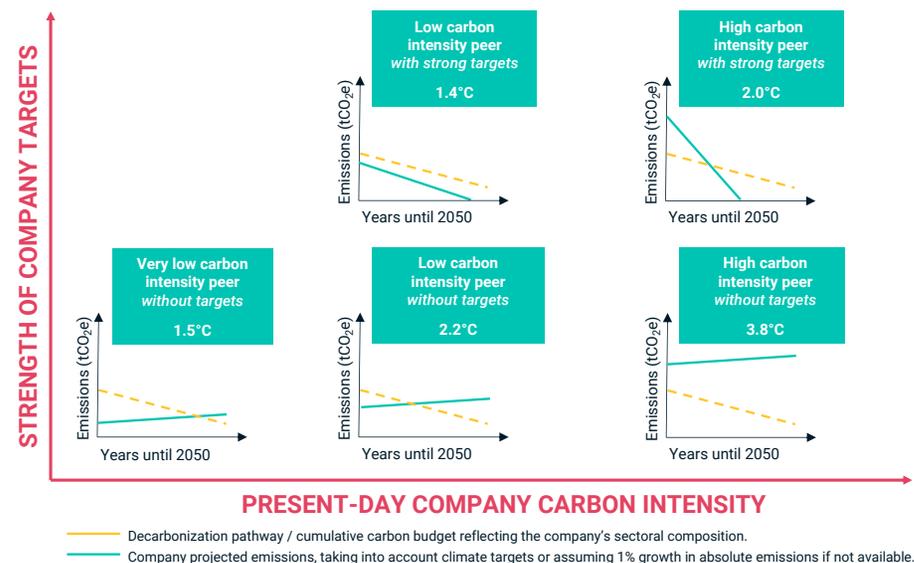
The updated ITR model features sector-specific decarbonization pathways compatible with the goal of limiting warming this century to 1.5°C above preindustrial levels. If, for example, an automotive company decarbonizes as steeply as required by its transportation-sector-specific pathway, the company would be “1.5°C-aligned” by definition. Though the company’s emissions may be high compared with companies in other sectors, its decarbonization reflects that required by the transportation sector in the NGFS Net Zero 2050 scenario.

A specific automotive company that is more carbon intensive (as measured by emissions per unit of revenue) in the sector will have to achieve more ambitious decarbonization targets than less carbon-intensive peers in order to converge toward the 1.5°C-aligned pathway. This is because the company’s present-day emissions consume more of the initial company budget defined by the 1.5°C-aligned pathway, reflecting the average sectoral carbon intensity.

Note that ITR is forward-looking. The metric reflects a company’s (or portfolio’s) projected emissions and not solely recent emissions, which look backward. These pathways are differentiated by sector and define fair-share company emissions budgets. The ITR model translates the degree of a company’s or portfolio’s alignment with its sector-specific decarbonization pathway as expressed in the following formula:

$$\text{Cumulative projected company emissions} - \text{Cumulative company emissions budget}$$

Exhibit 10: Hypothetical company ITRs based on climate targets and carbon intensity



Source: MSCI ESG Research. This is an illustration, which does not correspond with actual company data.

A company’s ITR reflects the influence of three key components (Exhibit 10):

- Recent emissions. High current emissions contribute significantly toward depleting the company’s carbon budget, which in turns drives up the company’s ITR.
- Company climate targets. Decarbonization targets help to decrease a company’s cumulative emissions on a forward-looking basis. Depending on the company, however, its target may not be sufficiently ambitious to align with sectoral pathways.
- Sectoral decarbonization pathways. The sector-specific pathway establishes the carbon budget (per USD revenue) that aligns with an implied temperature for peer companies within a given sector. All pathways are differentiated by sector and region in the updated model. Less emissions-intensive companies could, in theory, stay within their fair-share carbon budget based on their cumulative emissions, regardless of whether they set a climate target.



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