The Future Isn't Static

How Science-Based Targets transform forward-looking climate risk.

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Executive Summary

Traditional climate risk analysis treats corporate emissions as if they will remain unchanged over time. This approach systematically overstates transition risk for companies that are actively decarbonising and have committed to science-aligned reduction pathways.

The Science-Based Targets initiative provides independently validated decarbonisation commitments, yet most investment datasets still assess risk based only on current emissions. Investors are left without a clear answer to two practical questions:

1. What happens to future risk if companies actually meet the targets they have published?
2. How much transition risk disappears if they do?

We address these questions by converting Science-Based Targets into forward-looking emissions trajectories and integrating those trajectories into Emmi climate risk models. This enables direct comparison between a business-as-usual pathway and a target-achieved pathway for every covered company.

We match more than four thousand absolute reduction targets to more than seventeen hundred public companies. These companies represent about one fifth of global public equity emissions, even though they account for only a small share of listed companies.

By recalculating Transition Value at Risk (TVaR), emissions reduction requirements and temperature alignment on the basis of target-aligned trajectories, we quantify the potential reduction in transition risk if companies deliver on their stated commitments and identify where further decarbonisation is still required.

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The Problem: Static Emissions in a Dynamic World

Most transition risk models project current corporate emissions forward as if nothing changes. This produces useful baseline estimates, but it can overstate future risk for companies that are already committed to significant emissions reductions. Thousands of firms have published targets through the Science Based Targets initiative (SBTi), yet traditional datasets still treat these commitments as irrelevant to future emissions profiles.

As a result, two practical questions remain unanswered. **What if companies actually achieve the reductions they have committed to, and how much transition risk disappears if they do?**

For portfolios with meaningful exposure to SBTi committed companies, a static approach may materially misrepresent forward-looking climate risk.

By incorporating SBTi targets, investors can move from a purely backward-looking emissions footprint to a more realistic view of future emissions pathways. This creates a more accurate basis for scenario analysis, valuation, risk management and engagement strategies.

Data Foundation

Source data and target filtering

We source corporate emissions targets through the FactSet hosted SBTi dataset. SBTi validates that published targets align with Paris Agreement pathways, which provides a level of credibility that voluntary disclosures do not always offer.

Targets appear in several formats. To maintain consistency in how reductions are calculated, we focus only on absolute reduction targets, such as a commitment to reduce Scope 1 emissions by a specific percentage from a defined baseline year. Intensity targets and other formats are excluded to avoid future assumptions.

After filtering, 10,583 absolute targets remain.

1,775
companies with targets

Deduplication and consolidation

Many companies publish multiple targets across Scopes and years. A good example is A. P. Moller Maersk, which discloses several Scope 3 targets across different value-chain categories. These range from subcontracted shipping operations to the use of sold products, each with its own reduction percentage and timeline. This reflects the different decarbonisation profiles within a single business, but it creates multiple overlapping targets for the same Scope and year.

To create a single representative value, combined Scope targets (i.e. Scope 1+2) are separated into individual Scope records and multiple targets for the same Scope and target year are consolidated using the median reduction percentage. This preserves a central estimate while reducing sensitivity to outliers and uneven disclosure detail.

Targets with target years that have already passed are removed, since we model forward-looking commitments rather than historical delivery. The result is one target per Scope per company per target year, providing a clean basis for constructing emissions trajectories.

Emissions matching

Processed targets are matched to reported or estimated emissions in the Emmi universe. This links each target to an observed emissions baseline and allows us to construct forward-looking emissions trajectories for each Scope. Target years are concentrated around 2030, 2040 and 2050, which reflects the standard structure of near-term and long-term SBTi commitments. Most matched targets are aligned to 1.5°C pathways in line with SBTi guidance.

Geographic coverage is strongest in the United States, Europe, and Southeast Asia, reflecting both SBTi adoption patterns and the composition of Emmi's emissions universe (Figure 1).

Coverage Metric	Value
Total matched targets	4,053
Unique companies with targets	1,775
Target-to-emissions match rate	38.3%
Percent of global public equity emissions covered	19.7%
Percent of public equity companies covered	3.5%

Geographic distribution of targets

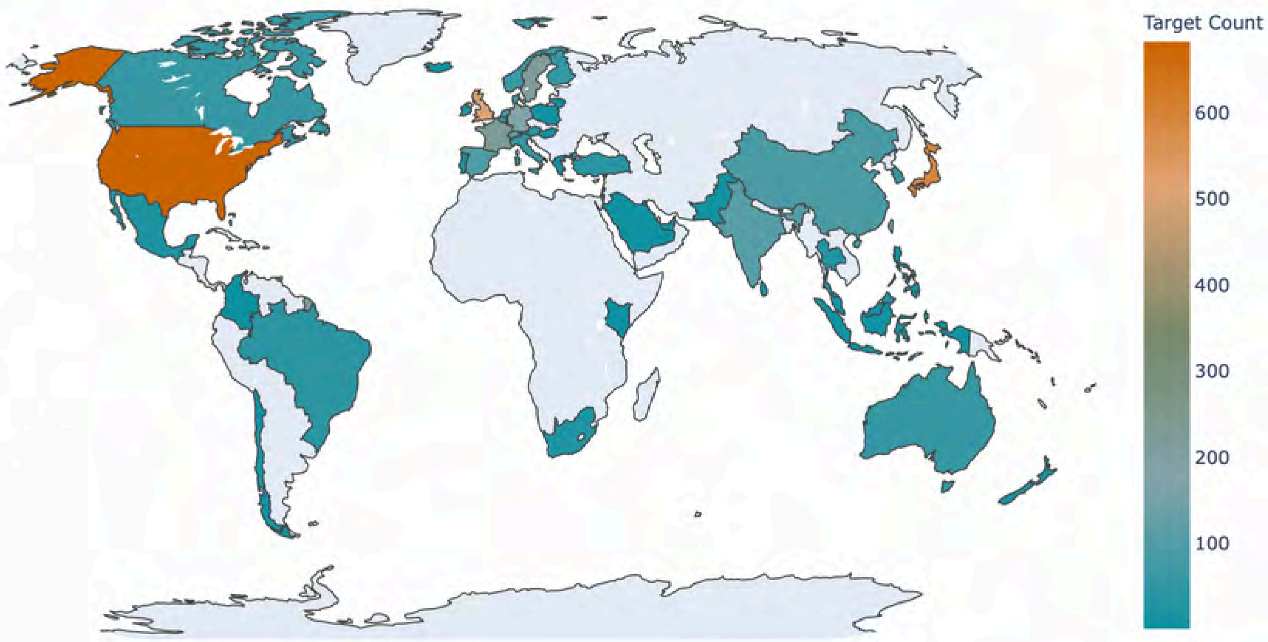

Figure 1: Geographic distribution of company emissions target

Methodology: From Targets to Trajectories

Target emissions calculation

Each SBTi target specifies a percentage reduction from a stated baseline year. We convert this into a target-year emissions value using the standard calculation:

$$E_t = E_b \times (1 - r)$$

where

- E_t is the implied target-year emissions
- E_b is the baseline-year emissions from the Emmi universe
- *r* is the stated reduction percentage

For example, a 42 percent reduction from baseline corresponds to r=0.42

Baseline emissions are taken from the closest available year in our emissions dataset to the company's stated baseline. This ensures trajectory calculations reflect observed historical emissions and are connected to the PCAF score of the underlying data.

Linear trajectory construction

We construct a linear emissions pathway from the baseline year to each target year, assuming steady annual progress toward the stated commitments. For companies with multiple sequential targets, trajectories are created in segments. For example, emissions move linearly from the baseline year to 2030 and then from 2030 to 2050 (demonstrated in Figure 2).

Beyond the final target year, emissions are held constant if no further commitments are published.

Although real-world decarbonisation may not be linear, this approach provides a consistent and transparent method across the universe and avoids introducing further assumptions about timing.

Scope 1 historical vs target emissions (top 20 with targets for this Scope, Scope 1)

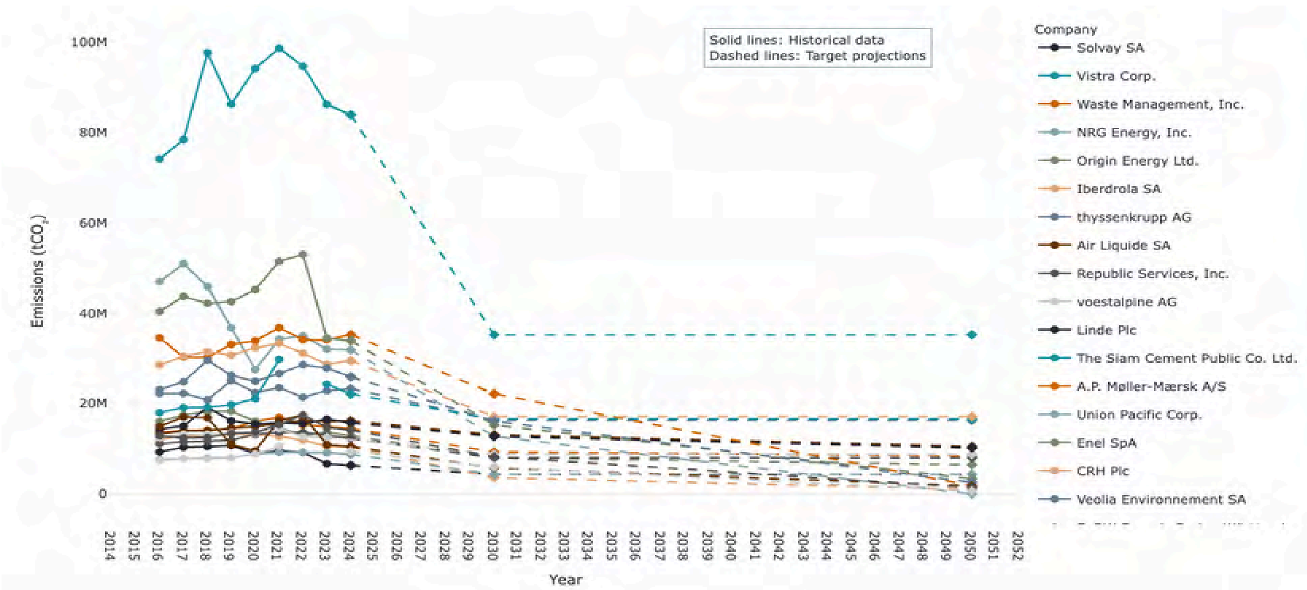

Figure 2: Top 20 companies Scope 1 with targets, demonstrating the linear glide paths

Scope coverage and gap handling

Where a company has no target for a given Scope, we carry current reported emissions forward unchanged. This ensures that all Scopes contribute to future risk calculations without assuming reductions that have not been explicitly committed to.

If a company's current emissions already fall below its implied target trajectory, we use the current value rather than increasing emissions to match the modelled pathway. This prevents unrealistic results where the implied target path would require emissions growth.

"... this approach provides a consistent and transparent method across the universe and avoids introducing further assumptions about timing."

Risk Integration

Target emissions calculation

Target-aligned trajectories are integrated into Emmi's scenario-based transition risk framework. This produces a new set of outputs based on projected emissions rather than current emissions. We recalculate three core metrics:

- Transition Value at Risk (TVaR)
- Emissions reduction requirements
- Temperature alignment

TVaR generally falls once targets are incorporated, since future emissions are lower under the target-achieved pathway.

Reduction requirements quantify the remaining emissions cuts required under a given climate scenario after a company achieves its published targets. Temperature alignment indicates the implied warming outcome based on the projected trajectory.

The reduction requirements are calculated by comparing target-aligned emissions with the emissions level implied by a specific climate scenario:

TVaR difference distribution: Projections-production

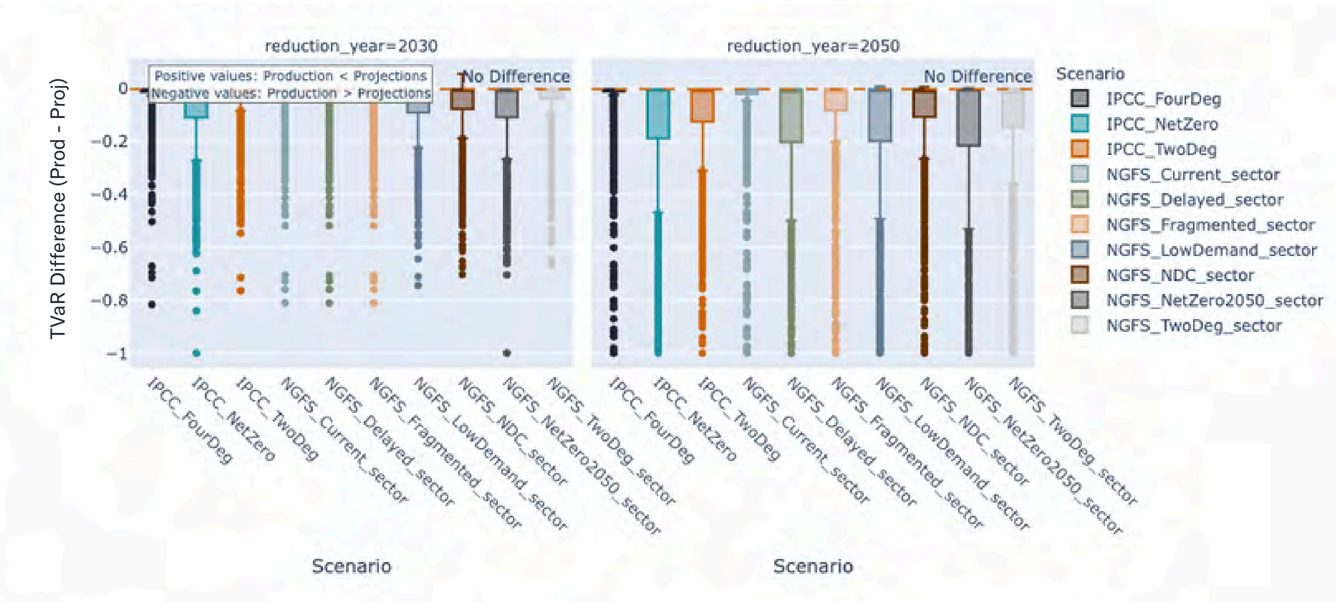

Figure 3: Transition Risk differences between current emissions and target emissions.

Baseline comparison framework

All metrics are calculated in parallel with Emmi's baseline methodology, which assumes emissions remain constant. Comparing target-adjusted results with the baseline provides a clear measure of the risk reduction linked to achieving the stated targets.

The difference between 'business-as-usual' and 'targets met' indicates how much transition risk would fall if companies deliver on their commitments. This helps identify holdings where corporate delivery has the greatest influence on future risk exposure and where further reductions would still be required under stricter scenarios. For example, Figure 4 shows Mærsk's Business as Usual vs their Trajectories, showing they will decrease their TVaR to effectively 0 in all scenarios except IPCC Net Zero 2050.

A.P. Moller-Maerk A/S TVaR trajectory: BAU vs target scenarios

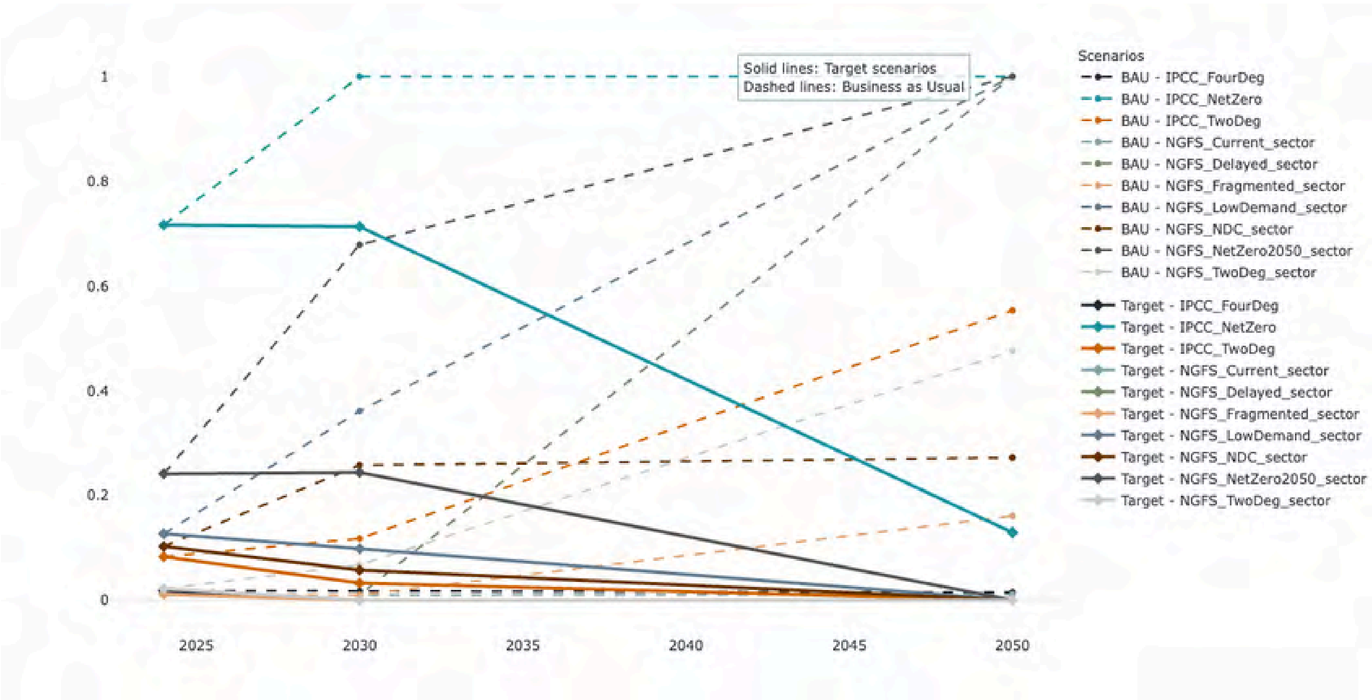

Figure 4: Maersk TVaR comparison between Business as usual (dashed) and target trajectories (solid).

Limitations and Assumptions

This approach depends on several assumptions that should be considered when interpreting results.

1. **Perfect achievement assumed:** Linear emissions trajectories assume companies deliver exactly what they have committed to. Real-world reductions may occur earlier or later than implied, and in some cases may not be achieved at all.

2. **Incomplete coverage:** Around 62% of SBTi absolute targets cannot be matched to emissions data, which limits the number of companies for which full trajectories can be constructed.

3. **Median aggregation:** Where companies publish multiple targets for the same Scope and year, we use the median reduction percentage. This provides a reasonable central estimate but does not reflect the relative size or importance of each emissions category.

4. **Exceeded targets handled conservatively:** If current emissions already fall below the implied trajectory, we use current emissions rather than allowing the pathway to increase. This avoids unrealistic outcomes but may understate the ambition of future targets.

5. **Historical targets excluded:** We model only future targets. Past targets are removed from glide path calculations to avoid implying that earlier reductions were achieved as stated.

6. **Missing Scopes carried forward:** Where no target exists for a given Scope, current emissions are held constant. This ensures all Scopes contribute to risk calculations without assuming uncommitted reductions.

These choices can create data lifecycle effects. For example, if a company's 2025 interim target passes without being replaced, its removal from the glide path may materially change the implied 2030 trajectory between data releases.

Applications

This methodology supports several analytical uses across investment and risk management processes. At the portfolio level, comparing TVaR and temperature alignment under baseline and target-achieved pathways shows how much transition risk is reduced if companies meet their stated commitments. For portfolios with significant exposure to SBTi-committed companies, this provides a more realistic view of future climate risk.

The difference between the two pathways also highlights where corporate delivery matters most. Companies that show a large reduction in future risk when targets are achieved become priority candidates for engagement and stewardship activity.

The target-based projections can also be used for scenario stress testing. Comparing full achievement, partial achievement and non-achievement paths shows how sensitive future risk is to the level of target delivery.

Finally, comparing target ambition and coverage across sectors and regions helps identify leaders and laggards in corporate decarbonisation and provides context for relative value decisions that incorporate forward-looking climate positioning.

"The target-based projections can also be used for scenario stress testing. Comparing full achievement, partial achievement and non-achievement paths shows how sensitive future risk is to the level of target delivery."

Data Access and Delivery

"... include projected emissions by Scope for key target years, scenario-adjusted metrics and temperature alignment, as well as underlying source identifiers for full traceability."

Target-adjusted emissions projections and associated risk metrics are delivered through Emmi's standard distribution channels, including the FactSet Carbon Diagnostics Platform for interactive analysis and Snowflake for direct data access.

The datasets include projected emissions by Scope for key target years, scenario-adjusted metrics and temperature alignment, as well as underlying source identifiers for full traceability. All outputs include versioned methodology tags that allow users to track changes over time and reconcile results with previous releases.

These projections are integrated into Emmi's Carbon Diagnostics tools, allowing users to compare baseline and target-achieved views within existing workflows and scenario analysis frameworks.

Conclusion

Science Based Targets offer a credible indication of how corporate emissions are expected to change over time. Converting these commitments into forward-looking trajectories and applying them within transition risk models provides a clearer picture of how future risk might evolve if companies deliver on their targets.

The results generally show reduced TVaR and improved temperature outcomes, while also highlighting where further reductions are needed to meet more ambitious IPCC and NGFS pathways. This provides investors with a practical way to compare business-as-usual with target achievement, prioritise engagement, and factor in future decarbonisation into investment analysis.

References

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IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report.

NGFS (2023). NGFS Scenarios for Central Banks and Supervisors. Network for Greening the Financial System.

About Emmi

Climate risk, built for investors

Emmi provides comprehensive climate risk intelligence for investors. Our datasets cover emissions, transition and physical risk across public and private markets, covering all major asset classes and driving 100% portfolio coverage.

Built on a consistent methodology, Emmi delivers the transparency and customisation investors need to make better investment decisions, meet climate disclosure requirements, and align with regulatory and mandate expectations.

Emmi is founded on a simple idea: mobilising capital is the fastest path to decarbonisation. By quantifying climate risk exposure at scale, we enable the financial sector to allocate capital more efficiently toward climate-aligned outcomes.

To meet this need, we built Carbon Diagnostics - decision-useful climate insights, delivered at scale.

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