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Investor Portfolio Alignment with the Paris Agreement

A multi-sector, multi-asset class approach

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Executive Summary

- The Paris Agreement's long-term temperature goal is to keep the increase in global average temperature to well below 2°C above pre-industrial levels. Under this agreement, each country must plan and report on their climate change mitigation actions. Institutional investors (insurance companies, pension funds, sovereign funds, banks, asset managers) are now increasingly looking to align their strategies with the Paris Agreement. They also want to assess and report on portfolio alignment in practical terms.
- S&P Global Trucost's approach to investor portfolio alignment assesses individual corporate decarbonization rates against those required to achieve the goals of the Paris Agreement, and combines them into a portfolio-level assessment of alignment.
- Trucost's approach can be widely applied and is both sector and asset class independent, applying two alignment methodologies initially developed by academics and further developed by the Science Based Targets Initiative (SBTi).
- The approach provides significant advantages in:
  a. The breadth of sectors and companies that can be assessed (so, broad, consistent coverage within a portfolio).
  b. The ability to provide consistent assessments across a range of asset classes, including in the unlisted/illiquid space (so, consistency in assessments between portfolios and asset classes).
  c. Taking into account, where possible, industry-specific and economically feasible rates of decarbonization and differing production growth rates of companies. This is done in a way that does not implicitly penalize companies that are fast growing by requiring a one-size-fits-all rate of decarbonization in absolute emissions.
- Trucost's Paris Alignment dataset shows that more than two-thirds of listed companies are misaligned with the Paris Agreement aim of limiting warming to 1.5–2°C. Better results, in general, are evident for the real estate sector, as well as financial and health care, with typically lower direct emissions. Geographic differences are also evident in the results, with a stronger alignment with issuers in developed markets compared with emerging markets.
- For asset managers that are dedicated to multi-asset portfolio management, Trucost's approach is particularly relevant. Indeed, with diversification pockets currently on the rise, portfolio-level assessments are increasingly less meaningful if they omit this pocket on grounds that data is non-existent or methodologies inconsistent. For asset owners as well as asset managers, extending the alignment assessment methodology to private and illiquid asset classes (e.g., real estate, infrastructure, private debt and private equity) is now critical for the following reasons:
  - Reporting/regulatory requirements: Climate or sustainable finance disclosure regulations now tackle all asset classes, not only liquid asset classes. Examples include the multi-asset class focus of the French Energy-Climate law or of the European Sustainable Finance Disclosure Regulation's allocation strategies that comprehensively reflect all sectors across a portfolio: The same carbon-intensive or low-carbon activity can be found in both liquid or illiquid asset classes, hence the need to have the global picture.
  - Integration of climate factors that can impact risks/returns: Climate change factors can have a direct impact on the risk/return profile of illiquid assets.
  - Engagement of invested companies to accelerate change towards good practice and drive more forceful stewardship across asset classes: Investors in private equity, for example, now pay more and more attention at the carbon profile of companies.
  - Risk management that includes transition and physical risk exposure of assets in a portfolio: Conducting a climate risk assessment is becoming increasingly important for infrastructure asset managers as an example.

Introduction

In December 2015, 195 parties at the United Nations Framework Convention on Climate Change (UNFCCC) reached consensus on the Paris Agreement, which aims to keep global temperature rise well below 2°C above pre-industrial levels by 2100, and committed to pursue efforts to limit warming to 1.5°C.[1] Approximately 97% of these parties have communicated their intended Nationally Determined Contributions (NDCs) to combat the impacts of climate change and to increase capital flows towards a low-carbon and more resilient economy.[2] Yet, according to recent data from Climate Action Tracker, even if all governments achieved their NDCs by 2030, the world will still likely warm by 3°C or higher by 2100 — well above the 2°C limit agreed upon.[3] This is a call to action to the financial market to help facilitate an adequate flow of capital toward a low-carbon economy. Scenario analysis is an aid to facilitate this by enabling investors to determine which companies and sectors are compatible with a below 2°C world and are better positioned to withstand potential risks as a result of climate change.

A number of milestones show that the commitments made as part of the 2015 Paris Agreement have translated into concrete actions, in particular with relation to the use of the alignment concept:

- Article 173 of the French Energy Transition Law, entered into force on 30th December 2015, was the first piece of legislation worldwide to require institutional investors to disclose their contribution to climate objectives and to financial risks associated with the energy and environmental transition. These requirements have been shown to be effective from the reports published in 2017 for the year 2016.
- In 2017, the Task Force on Climate-related Financial Disclosures (TCFD) released climate-related recommendations for disclosing clear, comparable and consistent information about the financial risks and opportunities presented by climate change. As it focuses on risk analysis, it does not mention the concept of alignment, but highlights the importance of climate scenario analysis.
- The publication in 2018 of the Intergovernmental Panel on Climate Change's (IPCC's) special report on the impacts of global warming of 1.5°C above pre-industrial levels placed renewed focus on the importance of the 1.5°C scenario.
- The European Union (EU) has been particularly active on the topic. Published in 2019, the EU Climate Benchmark Regulation sets out criteria for indices and benchmarks to be considered Paris-aligned. The EU Taxonomy for Sustainable Activities, published in March 2020, identifies economic activities that are already compatible with a 2050 net-zero carbon economy. Therefore, the percentage of investments that are taxonomy-aligned indicates the exposure of a portfolio to activities that are already compatible with a 2°C economy at a specific point in time.
- The EU has also come up with a list of adverse sustainability impact indicators certain investors must report on going forward (under the Sustainable Finance Disclosure Regulation). Carbon footprint, carbon intensity and carbon emissions reduction initiatives are among the indicators that were selected.

[1] UNFCC, "What is the Paris Agreement?", https://unfccc.int/process/the-paris-agreement/what-is-the-paris-agreement
[2] UNFCC, "Nationally Determined Contributions (NDCs)", https://unfccc.int/process/the-paris-agreement/nationally-determined-contributions/ndc-registry#eq-4
[3] Climate Action Tracker, "The CAT Thermometer", 2018, retrieved from: https://climateactiontracker.org/global/cat-thermometer

- Finally, companies, insurers, banks, asset owners, asset managers and governments are making net zero commitments to achieve carbon neutrality. Net zero is achieved when the amount of greenhouse gas (GHG) emissions that are released into the atmosphere is no more than what is removed from the atmosphere through oceans and carbon sinks.

While 2°C alignment approaches can rely on any 2°C trajectories and methodological choices as long as these are internally consistent, approaches that seek to capture alignment with the temperature objective of the Paris Agreement need to fulfill additional requirements. The Paris Agreement not only sets an objective of compatibility with well-below 2°C trajectories, but it is also more prescriptive in terms of the principles embedded within the desired well-below 2°C trajectory. 2°C alignment and alignment with the temperature objective of the Paris Agreement are, therefore, different concepts.[4]

Table 1: Differences between temperature trajectories alignment and the Paris Agreement objectives

	Trajectory(ies) principles	Methodological principles
Temperature trajectories alignment (e.g., 2°C trajectory alignment)	Any, as long as it is compatible with the relevant temperature outcome (e.g., 2°C).	Any, as long as internally consistent: alignment as a mathematical measure of proximity.
Alignment with the temperature objective of the Paris Agreement	• Trajectories limiting the increase to 1.5°C, with global peaking of GHG emissions as soon as possible followed by a rapid reduction of emissions to achieve carbon neutrality in the second half of the century. Precautionary principle: • Trajectories with no or limited overshoot. • Lower reliance on GHG removal technologies.	• Internal consistency. • Covers all sectors. • Adopts a value-chain approach. • Takes into account locked-in emissions. • Evaluations based on estimates of how to optimize the long-term transformation of the economy at least cost. • Updated through time. • Takes into account uncertainty.
Alignment with the objectives of the Paris Agreement	Same as above but also takes into account nationally determined climate resilient low-carbon development pathways: • Takes nationally determined pathways as a starting point. • Takes into account adaptation and broader sustainable development objectives.	Same as above: • Covers all activities (whole portfolio asset classes). • Captures incremental changes and long-term transformative outcomes.

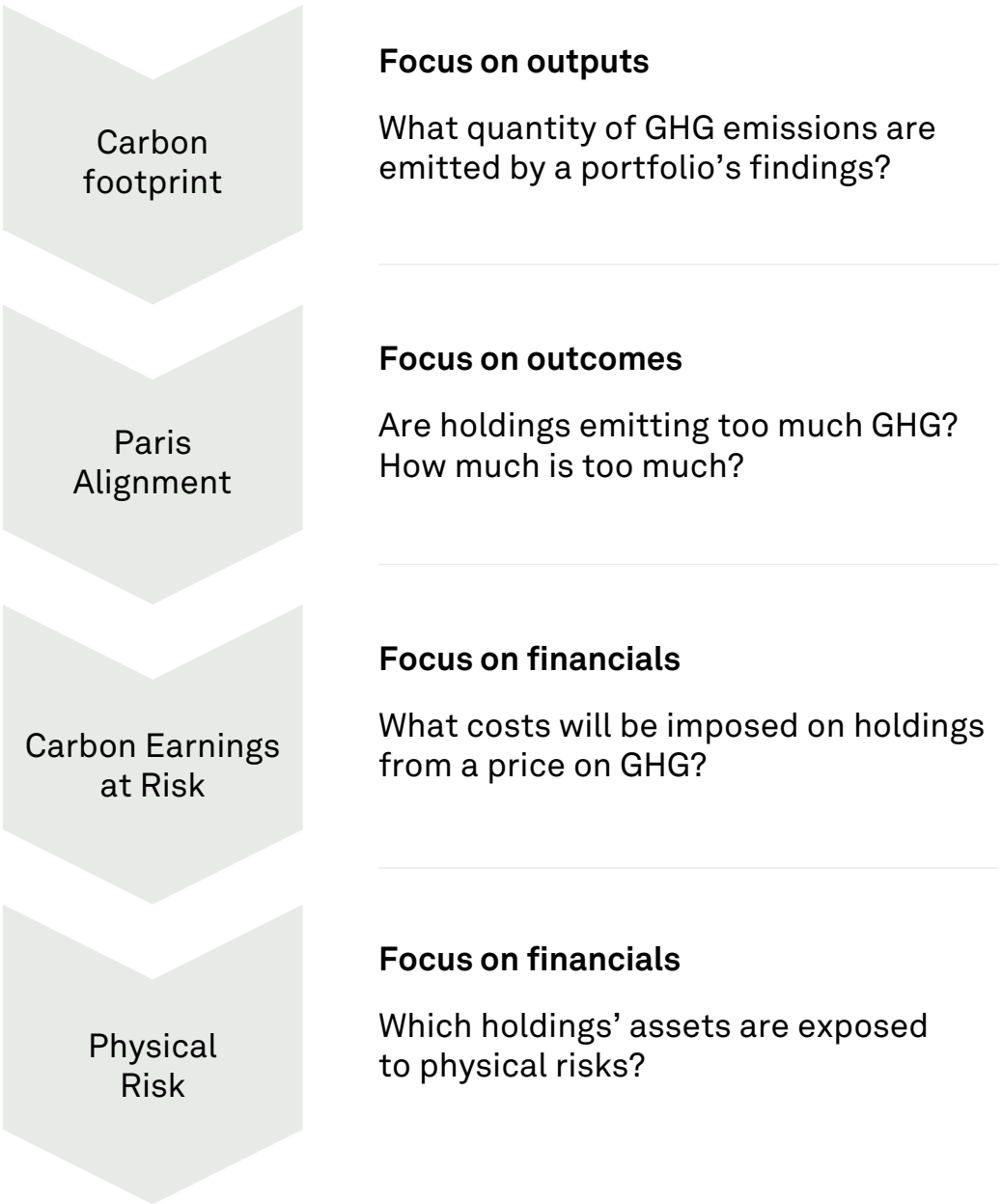
Source: The Alignment Cookbook, Institut Louis Bachelier, 2020, adapted from I4CE 2019, https://gsf.institutlouisbachelier.org/publication/the-alignment-cookbook-a-technical-review-of-methodologies-assessing-a-portfolios-alignment-with-low-carbon-trajectories-or-temperature-goal/

[4] A Framework for Alignment with the Paris Agreement: Why, What and How for Financial Institutions?", I4CE Institute for Climate Economics, September 2019, www.i4ce.org/wp-core/wp-content/uploads/2019/09/I4CE%E2%80%A2Framework_Alignment_Financial_Paris_Agreement_52p.pdf).

For illustrative purposes only

Finally, as this paper puts the emphasis on the concept of Paris Alignment, it is important to remember that this metric is but one of the key indicators that are essential for a complete climate analysis of an investment portfolio. Each of these indicators, as summarized below, focuses on a different perspective and asks a specific question:

Figure 1: The role of Paris Alignment assessment in portfolio carbon analysis



Source: S&P Global Trucost (2021)

1. The Development of Paris Alignment Metrics for Corporates and Investors

In recent years, the topic of alignment with scenarios for 1.5–2°C has received significant attention from corporations and from their debt and equity investors. The topic involves a very different frame of reference than the task of understanding scenario alignment at a global economy-wide level, and has required the development of new techniques and methodologies to facilitate the task. At a global economy-wide level, purely objective scientific concepts can be applied to understanding alignment with scenarios. However, the task of determining scenario alignment for an individual economic actor or actors, including a fair and efficient allocation of a share of the future global carbon budget, does not have simple or objective answers. Conceptual and methodological tradeoffs and choices have to be made.

A range of alternative approaches have been developed by academics, non-governmental organizations (NGOs) and investment practitioners since approximately 2015. Today, a variety of approaches are in use and, so far, there is a lack of norms or consensus on a single appropriate methodology or standard for assessing alignment. Different methodologies may result in different conclusions for a given company and, inevitably, different approaches have both advantages and disadvantages.

Recently, governments and associated regulatory and oversight bodies have also taken an increased interest and, in some cases, have developed guidelines, recommendations or, occasionally, even regulations requiring investors to disclose their level of alignment with the Paris Agreement. However, they have generally not prescribed a particular methodology or technique.

Key approaches to assessing Paris Alignment in the literature have focused on:

- Technology mix
- Transition pathways
- Fundamental assessments, including qualitative management systems and governance structures
- Emissions avoided/removed

Approaches can also be combined, for example by examining both qualitative fundamental and quantitative transition pathway metrics.

The most prevalent approaches at the time of writing are those advocated by:

- The SBTi, a coalition of NGOs which recommends a series of possible approaches that can be described as transition pathway approaches, as they measure the rate of decarbonization relative to Paris Alignment goals in one of several ways. Their recommendations are based on a menu of methodological options that, typically, were first created by academics and several pioneering companies. According to the SBTi, their approaches have achieved notable adoption by companies, with over 725 companies having set targets approved by the SBTi and many more committed to setting such targets in the future. A key feature of the SBTi is its multi-stakeholder buy-in, which has enabled relatively wide adoption of its approaches. The SBTi's various working groups take input from multi-stakeholder groups that include civil society groups, scientific advisors, investors and companies.
- The 2 Degree Investing Initiative (2dii), an NGO, has developed an approach that can be called a technology mix approach. This is because it focuses on the proportions of key high- and low-emitting production technologies in key sectors that are required to achieve Paris-aligned warming outcomes. The 2dii's Paris Agreement Capital Transition Assessment (PACTA) provides an online interface to produce free portfolio results that has been much used by investors. It provides forecasts of emissions based on asset-level databases, which are then compared with sector-specific requirements from climate scenarios.

Table 2: Alternative approaches to assessing Paris Alignment

	Description	Advantages	Disadvantages	Common names	Used by
Technology mix	Directly relates to share of "brown" or "green" activities.	Intuitive. Less complex to interpret than GHG emissions metrics.	Only possible for a narrow range of sectors (approx. 10% of diversified portfolios). Could be considered too prescriptive: there is no consensus on optimal technology mix. No portfolio-wide assessment signal.	Capacity-based approach.	PACTA
Transition pathway: absolute based	Assumes absolute reduction of emissions at homogeneous rate: • Well-below 2°C: Min. 2.5% annual linear reduction • 1.5°C: Min. 4.2% annual linear reduction	Portfolio-level aggregation of results possible. Can be applied to any sector. Requires least company data to calculate aligned trajectory.	May favor slow growth companies and sectors over those with fast production or activity growth. "One-size-fits-all" approach.	Absolute contraction.	SBTi individual company target setting recommendations. SBTi /CDP/ WWF* portfolio temperature scoring tool.

Table 2: Alternative approaches to assessing Paris Alignment (continued)

	Description	Advantages	Disadvantages	Common names	Used by
Transition pathway: intensity-based	Sector-specific physical or economic intensity-based benchmark (depending if the sector carbon budget is divided by a physical or financial factor). Intensity-based benchmarks (by a unit of production) are the best suited to compare companies operating within the same sector.	Portfolio-level aggregation of results possible. Sector independent. Accounts for differences in company growth rates. SDA* takes account of economically efficient decarbonization rates for sectors, where executable.	Physical intensity-based approach (SDA) can only be applied to a limited set of homogeneous sectors.	SDA. Economic intensity or contraction of carbon intensity approaches (e.g., GEVA*).	SBTi individual company target setting recommendation (SDA for selected sectors, or GEVA currently where combined with an absolute emissions reduction target), Trucost.
Fundamental	Multiple indicators, including qualitative indicators covering risk management and corporate governance structures.	Considers multiple and more diverse indicators, taking reliance off a single indicator.	Opportunities for greenwashing and disclosure bias by ranking disclosures. Companies with most public pressure, incentive or resources to disclose may excel.		Transition Pathway Initiative, ACT
Avoided/removed emissions	Mitigation options include decarbonization, carbon dioxide removal, avoided emissions and offsetting with carbon credits.	Maximizing the avoided emissions associated with a portfolio is a potentially interesting measure to assess and incentivize investors to allocate capital to the most impactful climate solutions.	Potential double counting issues. No consensus yet on inclusion of avoided/ removed emissions in recognized frameworks (IIGCC* Net Zero Investment, SBTi for financial institutions).		Mirova

*CDP: Carbon Disclosure Project
WWF: World Wildlife Fund
SDA: Sectoral Decarbonization Approach
GEVA: Greenhouse Gas Emissions per unit of Value Added
IIGCC: Institutional Investors Group on Climate Change
Source: S&P Global Trucost (2021)

2. Trucost's SDA-GEVA Approach

Trucost's Paris Alignment assessment enables investors to track their portfolios and benchmarks against the goal of limiting global warming to below 2°C from pre-industrial levels, as well as other climate change scenario outcomes. The approach taken by Trucost can be described as a transition pathway assessment, which examines the adequacy of emissions reductions over time in meeting a 2°C carbon budget. It tracks company emissions and activity levels, including forward-looking indicators over a medium-term time horizon. It is one of several key approaches to 2°C alignment assessment in growing usage today.

Trucost has taken an approach that most closely parallels SBTi recommended approaches advocated for individual companies to set Paris Agreement aligned 1.5–2°C targets. However, it is applied to a universe of thousands of companies that, in turn, can be applied to a diversified investment portfolio.

The SBTi promotes best practice in science-based target setting towards the transition to a low-carbon economy and is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI) and the WWF.

Trucost's Paris Alignment assessment adopts two key methodologies initially developed by academics and also highlighted by the SBTi: [5]

- A physical intensity-based approach: SDA
- An economic intensity-based approach: GEVA

These, among others, are approaches the SBTi recommends could be used by individual companies to define company GHG emission reduction targets, or future transition pathways, consistent with the Paris Agreement. Setting such targets in advance of carbon regulations enables companies to be well equipped to respond to transition risks. Some companies have set verified targets with SBTi, while others have formally committed to setting targets in the future consistent with achieving the Paris Agreement using these and similar methodologies.[6]

[5] Key references for further explanation of these methodologies include: "Aligning corporate greenhouse-gas emissions targets with climate goals", published in the journal Nature Climate Change (2015), by Oskar Krabbe, Giel Linthorst, Kornelis Blok, Wina Crijns-Graus, Detlef P. van Vuuren, Niklas Höhne, Pedro Faria, Nate Aden and Alberto Carrillo Pineda; "Greenhouse gas emissions per unit of value added ("GEVA") — A corporate guide to voluntary climate action", in the journal Energy Policy (2012), by Jorgen Randers.

[6] "The new normal: 1,000 companies are now setting science-based climate targets", 08/10/2020, Science Based Target Initiative, https://sciencebasedtargets.org/blog/the-new-normal-1-000-companies-are-now-setting-science-based-climate-targets

Trucost adapts these two methodologies to be scalable from individual company target-setting to assessments of portfolios that may include hundreds or thousands of companies. Trucost's SDA-GEVA is already used by many investors, including CNP Assurances,[7] Fonds de Reserve des Retraites (FRR),[8] Government Pension Investment Fund (GPIF),[9] Établissement de Retraite Additionnelle de la Fonction Publique (ERAFP),[10] KBC Group,[11] Allianz,[12] Generali,[13] BNP Paribas Cardif,[14] Banque de France,[15] FDC Luxembourg[16] and others. It supports the identification of industry leaders and laggards when it comes to decarbonization. A key advantage of a transition pathway approach is its ability to be applied across a wide variety of portfolio holdings, plus be aggregated to portfolio-level results. It is not limited to the assessment of one, or a small number of sectors or business activities.

An alternative approach, the technology mix approach to 2°C alignment, is limited in its application to business activities with widely disclosed technology mixes, e.g., power generation. This approach, though used in the past by Trucost, is useful for within-industry comparisons and provides intuitive results, but cannot generally be expanded upon or aggregated to a portfolio-level assessment. For this reason, Trucost has adopted the transition pathway approach.

[7] CNP Assurances Sustainable Investment Report 2019, https://www.cnp.fr/en/cnp/content/download/8987/file/RIR%202019%20VA%20pour%20mise%20en%20ligne%20V%2008.2020.pdf
[8] FRR LTE Report 2018, https://www.fondsdereserve.fr/documents/Rapport-Article-173-LTE-FRR-2018.pdf
[9] GPIF TCFD Report 2019, https://www.gpif.go.jp/en/investment/trucost_report_en.pdf
[10] ERAFP Public Report 2019, https://www.rafp.fr/en/sites/rafp_en/files/publication/file/rafp-ra-uk-2019-v3_page.pdf
[11] KBC Group Sustainability Report 2020, https://www.kbc.com/content/dam/kbccom/doc/sustainability-responsibility/PerfRep/2020/csr-sr-2020.pdf
[12] Allianz France Sustainable Investment Report 2020, https://www.allianz.fr/content/dam/onemarketing/azfr/common/marque/pdf/BROCH_ALZ_INVESTMENT_REPORT-2020_FR.PDF
[13] Generali France Climate Book 2019, https://institutionnel.generali.fr/sites/default/files/book_climat_site_institutionnel.pdf
[14] Cardif SFDR Report 2020, https://cardifluxvie.com/documents/66941/477304/Rapport_SFDR_2020.pdf.pdf/7d00b878-acb1-dc95-b5a0-290c671f3d5c
[15] Banque de France SRI Report 2020, https://publications.banque-france.fr/sites/default/files/medias/documents/rapport_investissement_responsable_2020.pdf
[16] FDC Rapports d'investisseur responsable 2020, https://www.fdc.lu/fileadmin/file/fdc/Rapport_investisseur_responsable_2020_%28version_finale_web%29.pdf

Figure 2: Illustrative headline results of a Trucost portfolio Paris Alignment report

Trucost ESG Analysis
S&P Global

Paris Alignment

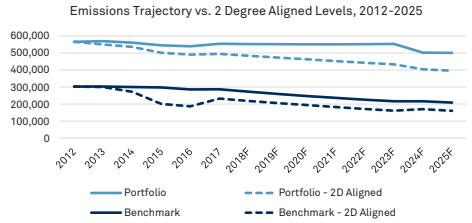
UNDERSTANDING PARIS ALIGNMENT

Trucost's 'Transition Pathway Assessment' enables investors to track their portfolios against the goal of limiting global warming to 2°C above pre-industrial levels. The assessment examines the adequacy of emissions reductions made over time, by investees, in meeting these targets. It incorporates both historical performance as well as forward-looking indicators (over a medium-term time horizon). This avoids the uncertainties of using only forward-looking data, and is of a sufficient time horizon to make the effect of any year-on-year volatility less significant. Historical data on greenhouse gas emissions and company activity levels is incorporated from a base year of 2012. Forward-looking data sources are used to track likely future transition pathways from the most recent year of disclosed data through to 2025.

Trucost's approach is adapted from two methodologies highlighted by the Science Based Targets Initiative (SBTi), these being the Sectoral Decarbonization Approach (SDA) and the Greenhouse gas Emissions per unit of Value Added (GEVA) approach. The SDA is applied to companies with high-emitting, homogeneous business activities, while GEVA is applied to those with lower emitting, heterogeneous business activities. For more information on the methodology please refer to Appendix 3.

EMISSIONS TRAJECTORY

The chart shows the portfolio and benchmark's 2012-2025 trajectory and compares that to its own 2 degree aligned trajectory.



LEVEL OF WARMING

The boxes below show the level of warming associated with the portfolio and benchmark, based on performance over the period assessed.

Portfolio (°C)	Benchmark (°C)
>3	>3

	Portfolio	Benchmark
Tonnes Carbon (Under)/Over	961,261	703,680
Percent of Total (Under)/Over	14.4%	23.8%
Carbon/mInvested (Under)/Over	382	280

SECTOR CONTRIBUTIONS

Companies with predominantely homogenous business activites that fall into one of the 5 sectors in the table below were assessed using the SDA approach. This means that the required carbon intensity reductions were calculated in sector specific units of production (for example tonnes of steel produced, or number passenger miles flown), and each company's share of the overall sector budget is calculated relative to its market share.

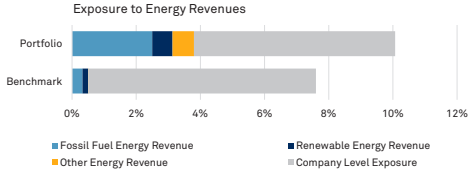
Companies with low emitting or heterogeneous business activities were assessed using the GEVA approach. This means that required carbon intensity reductions were calculated in carbon-per-dollar of value added (gross profit), and each company's share of the overall sector budget is calculated using its progress against required reduction rates.

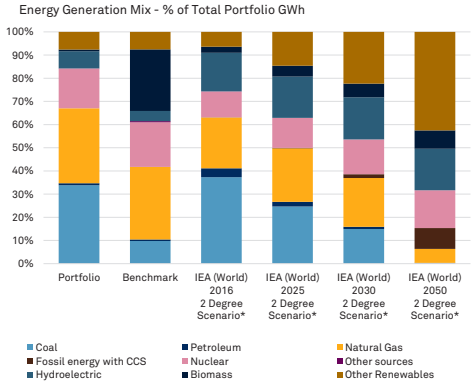
Method	Sector	Contribution (tCO_2e)	Pathway (°C)
SDA	Power Generation	45,033	2 to 2.7
	Cement	8,888	2 to 2.7
	Steel	25,704	>2.7
	Airlines	10,381	>2.7
	Aluminum	0	
GEVA	Communication Services	7,565	>5
	Consumer Discretionary	17,590	2 to 3
	Consumer Staples	28,427	>5
	Energy	288,430	>5
	Financials	-1,400	1.5 to 2
	Health Care	6,434	>5
	Industrials	45,272	>5
	Information Technology	8,005	>5
	Materials	131,796	>5
	Real Estate	69,752	>5
	Utilities	67,256	>5

ENERGY TRANSITION 2 DEGREE ALIGNMENT

In addition to the emissions alignment analysis above, Trucost is also able to assess the portfolio's energy mix alignment to a 2 degree scenario. The right-hand chart shows the share, by energy type, of the total GWh apportioned to the portfolio and benchmark. This can be compared to the energy mix required at different reference years for the low carbon economy of the future, as suggested by the International Energy Agency's (IEA) 2 degree scenario.

As not all energy companies disclose GWh produced, it is also useful to determine exposure to energy 'aggravators' and 'mitigators' based on sources of revenue. The chart below shows total exposure to companies with any energy revenues (total bar size), while the light blue, dark blue and yellow segments represent the weighted-average revenue exposure to fossil fuel, renewable, and other energy revenues respectively.





* The content within table above was prepared by S&P Trucost Limited, with data derived from the 2 Degree Scenarios developed by the International Energy Agency. ©OECDIEA 2017. The content within the table above does not necessarily reflect the views of the International Energy Agency.

TCFD Aligned Report 6

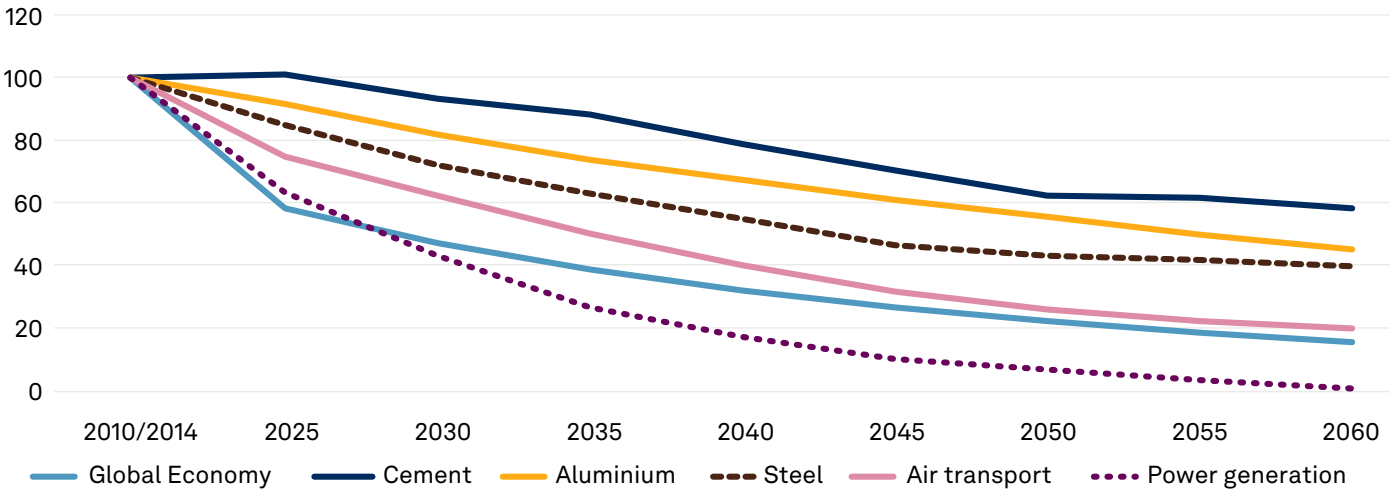
Source: S&P Global Trucost (2021)
For illustrative purposes only

SDA Approach

The SDA is applied to companies with high-emitting, homogeneous business activities. Its core principle is that companies in each industry must converge toward emissions intensities consistent with a 2°C scenario by 2050 from their unique starting points. It uses industry-specific 2°C scenario pathways, with companies measured using industry-specific emissions intensities and physical production levels (e.g., tCO_2e per gigawatt hours (GWh) or per ton of steel). Inflation, therefore, does not affect the calculation. Industry-specific transition pathways may be faster (e.g., power), or slower (e.g., cement) depending on an industry's available technologies, specific mitigation potential and costs of mitigation. Within a given industry, companies with low base-year emissions and low production growth can reduce emissions at a gradual rate. Companies with high emissions or high production growth must make faster reductions.

The scenarios used in SDA assessments are International Energy Agency (IEA) scenarios from Energy Technology Perspectives (ETP) 2017. These provide SDA assessment parameters consistent with 1.75°, 2° and 2.7°C of warming.

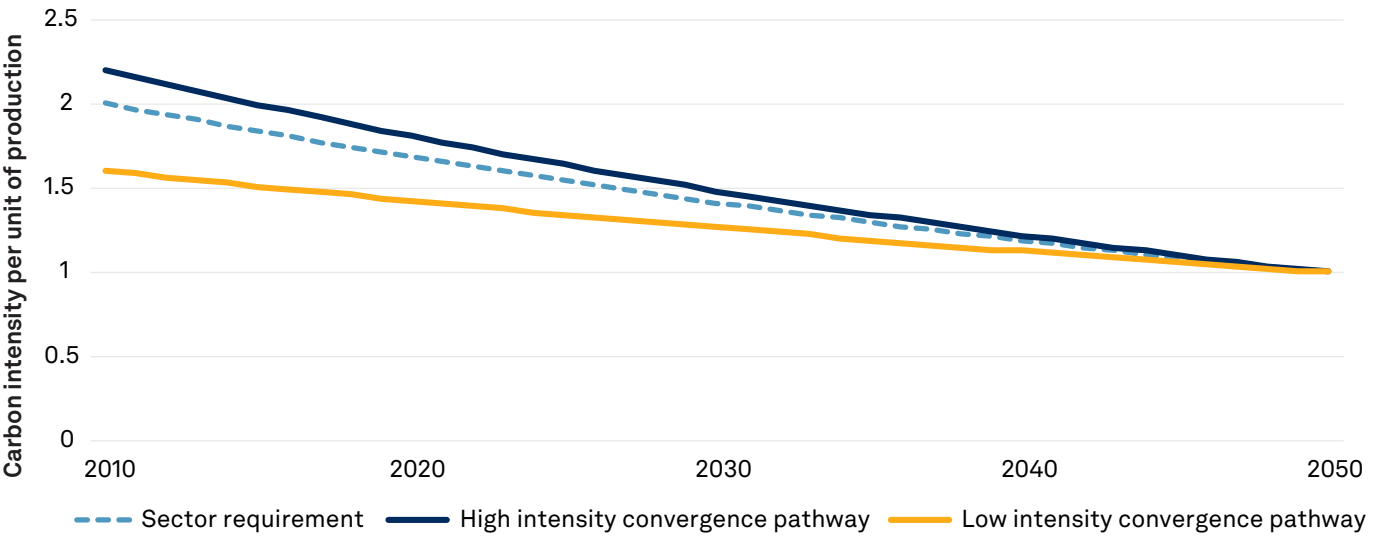
Figure 3a: SDA's differentiated Paris-aligned transition pathways by key sector



Y Axis: On a 100-point scale

Source: S&P Global Trucost (2021), based on SBTi

Figure 3b: Differentiated convergence pathways within sector based on baseline intensity



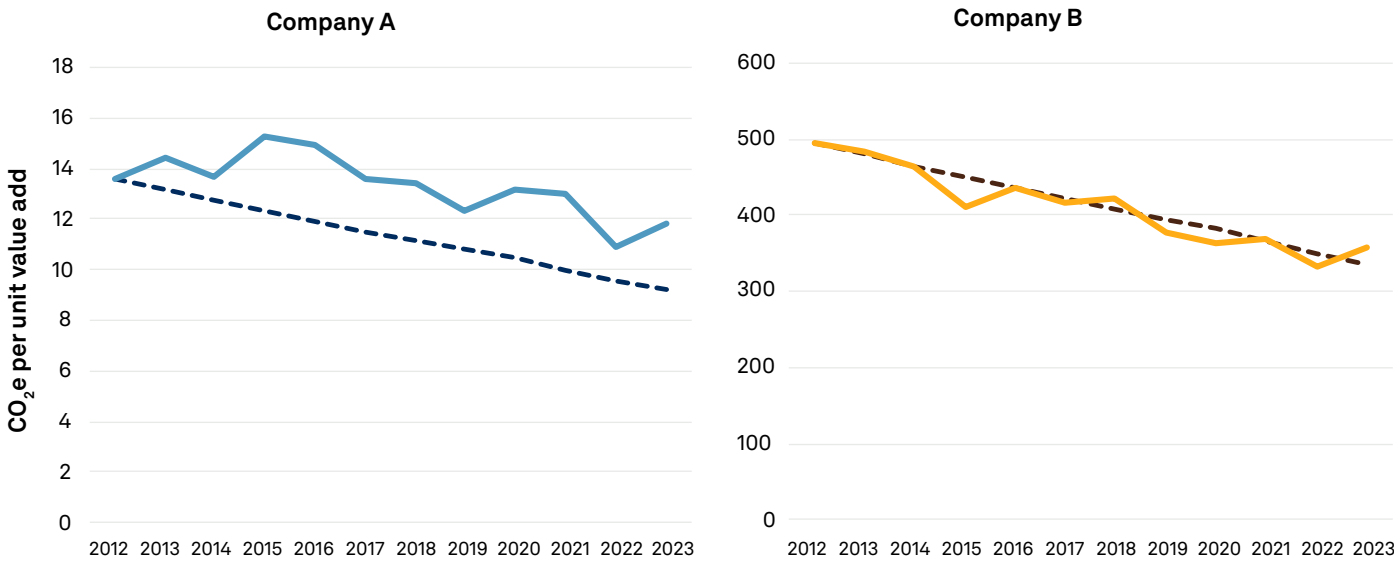
Source: S&P Global Trucost (2021), based on SBTi

GEVA Approach

GEVA is applied to companies with lower-emitting or heterogeneous business activities. It recognizes that many companies have diverse business activities, most of which do not have distinct transition pathways defined in climate scenarios. For these companies, GEVA entails applying a contraction of carbon intensity principle. Under this principle, a company should make emissions reductions consistent with rates required for the overall economy, from each company's unique base year emissions intensity. It uses a non-industry specific, economy-wide 2°C scenario and emissions intensities with a financial, not physical or production, denominator. Each company's transition pathway is measured as its GHG per unit of inflation-adjusted gross profit (revenue minus costs of goods sold), representing its contribution to total global emissions and emissions intensity. This is compared with a global economy-wide emissions intensity pathway required for achieving below 2°C of warming.

The scenarios used in GEVA assessments are Representative Concentration Pathway (RCP) scenarios used in the Fifth Assessment Report (AR5) from the IPCC. These provide GEVA assessment parameters consistent with 2°, 3°, 4° and 5°C of warming. A 1.5°C scenario is also available in line with recent guidance from the SBTi and European Union Paris-aligned Benchmark requirements.

Figure 4: Carbon intensity evolution for two different companies (blue or yellow line) but with the same IPCC-based reference scenario (dotted line)



Source: S&P Global Trucost (2021)

Integrating multiple sources of forward-looking data

Scenario alignment approaches have generally used only one source of forward-looking emissions data, typically either:

- Emissions reduction targets (e.g., Transition Pathway Initiative, SBTI), or
- Asset-level data (e.g., 2dii, Oxford Smith School)

Table 3: Forward-looking indicators applied to assessments

Source of forecast	Coverage	Typical sources	Approximate coverage across universal portfolios	Example
Company emissions reduction targets	Voluntary disclosure by companies, generally more common among larger companies in developed markets	Company reports, CDP	Less than 1/3 of companies	SBTi temperature scoring tool
Asset level data/ capital expenditure (CAPEX) plans	Generally high-emitting industries; some databases have global coverage	Proprietary commercial databases	Less than 1/5 of companies	2dii PACTA

Source: S&P Global Trucost (2021)

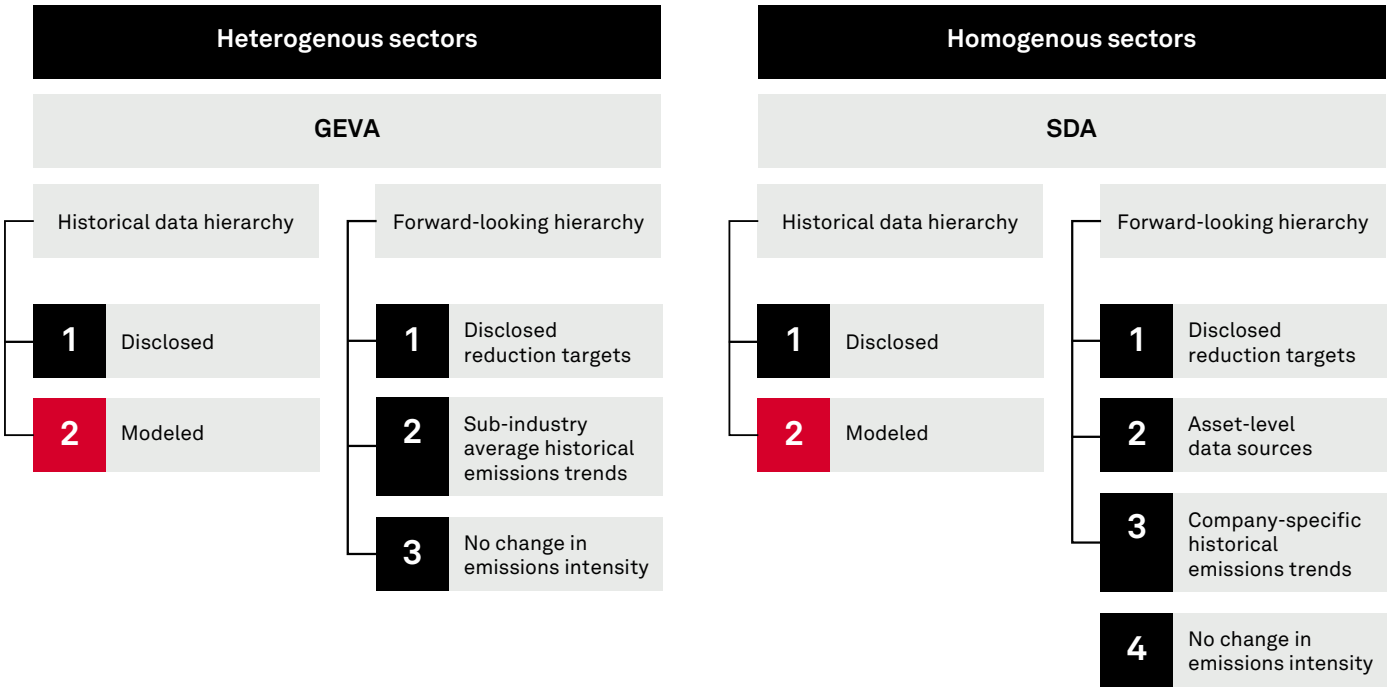
Taking just one approach, though, has a key disadvantage in either limiting coverage to companies that provide voluntary forward-looking disclosures, or to sectors where such forward-looking indicators can be derived from third-party datasets with information on key investment decisions. This information includes the construction of new facilities, which can be used to estimate the future path of emissions.

Trucost expands on this by incorporating multiple sources of forward-looking data in a clear data hierarchy, which enables a more comprehensive coverage universe not limited to either a small number of sectors or to companies that have voluntarily set targets.

Trucost's data hierarchy (applied to both SDA and GEVA) is as follows:

- Company emissions reduction targets or, if not available, then,
- Asset-level data or, if not available, then,
- Company-specific historical trends (for companies assessed using SDA), or,
- Sub-industry-specific historical trends (for companies assessed using GEVA) or, if not available, then,
- No change in emissions intensity.

Figure 5: Data hierarchy per approach



Source: S&P Global Trucost (2021)

Advantages of Trucost's intensity approaches

The SBTi recommends that company-level science-based targets be set using one of three broad approaches: absolute target, economic intensity-based or physical intensity-based.

Absolute contraction sets an equal absolute percentage of X% reduction requirement by year YYYY on any given company, regardless of the characteristics of the company. It is the simplest approach to execute when setting a science-based emissions reduction trajectory.

GEVA and SDA take more tailored, but more data-intensive, approaches to plot fairer required emissions pathways based on several relevant company-specific and/or sector-specific characteristics not considered under an absolute contraction method.

The absolute contraction approach differs from the Trucost SDA-GEVA approach in several ways:

a. The absolute contraction approach focuses on a single source of emissions forecasts and includes a fixed assumption about all other companies without targets.
b. Its absolute target setting methodology applied to all companies means that companies with fast growth rates in activity/production implicitly are required to carry a much higher burden. They would be required to achieve a much greater rate of operational efficiency to achieve a fixed, undifferentiated absolute reduction requirement, compared with a company with a slow rate of growth in activity/production.
c. The absolute contraction approach tends to ignore sectoral differentiation in alignment trajectories that can be calculated for several very high-emitting sectors, which enables optimization of decarbonization where it is most economically efficient.

d. The absolute contraction approach puts radically different relative obligations on companies where they have different activity growth rates. Consider, for example, a long-established mature supermarket chain growing profits by 1% a year versus an IT company with a breakthrough technology and business model growing profits at 20% a year. Absolute contraction would indicate that both should reduce their emissions by a fixed X% by year YYYY. But, in intensity terms, this would mean that the fast-growing company must reduce its emissions intensity much faster than the mature company per unit of activity/value added. If, instead, we consider the relevant goal for alignment to be in intensity terms, then we can better equalize the GHG mitigation effort required between different companies that have different underlying growth rates. At the extreme, it can let a very fast growing company reduce its emissions intensity in line with that required for the economy as a whole, while still increasing its absolute emissions, should it have a very fast activity growth rate. Other companies with slower activity growth rates would be reducing their emissions intensity and absolute emissions.

Trucost believes GEVA, an economic-based approach, is better placed to capture variations in companies' relative growth rates to achieve a fairer burden-sharing outcome across companies. This is because under GEVA, companies can reduce emissions intensity on a fixed-rate basis but, given their underlying activity growth rates, their absolute emissions can still evolve at different rates dependent on their unique activity growth rates.

GEVA relies upon a relatively simple manipulation of an absolute approach, in that it can use the same underlying scenario data, but with the required aligned emissions trajectory expressed as an intensity. This is emissions/GDP at the global economy level, or emissions/value added (inflation-adjusted gross profits) at the company-level equivalent — replacing a fixed and inflexible required absolute emissions reduction rate. However, we can consider an absolute-based approach and an economic-based approach as two sides of the same coin. The bottom line is that intensity targets for Scope 1 and Scope 2 emissions are only eligible when they lead to absolute emissions reduction targets.

Absolute contraction also does not consider the relative costs of emissions abatement that we can differentiate between some industries and companies within those industries using the SDA. Nor does GEVA explicitly differentiate between differing costs of abatement per unit of profit for different companies — which is why Trucost prefers SDA to GEVA, wherever it is executable.

For several of the highest-emitting sectors, such as power, steel or cement, some scenario datasets (most notably one published by the International Energy Agency) have individual sector-level detail in what would be the most cost-effective sectoral emissions pathways to achieve the Paris Agreement. We can also differentiate what historical progress a company has already made relative to its broader sector, and then infer whether further abatement by that company would likely be a relatively high cost or relatively low cost within its sector based on its current carbon efficiency.

Fairer pathways, based on cost of abatement, can be plotted that take account of an individual company's sector and its relative carbon efficiency within that sector. In that way, we can differentiate the fairest pathway based on the likely relative costs of abatement, for example, between a power generation company and a cement company. We can also look at the likely relative costs of abatement, for example, for a power company that has already significantly reduced its emissions versus one that has not.

The SBTi has traditionally recommended that an individual company consider all three approaches when deciding in what manner to set a science-based target, and then selecting the appropriate method within several constraints and guidelines. Recently, however, the SBTi has become more focused on the absolute contraction method, despite its limitations.

In one context, this appears to be a consequence of the simplicity and ease of applying the absolute method, as it has by far the fewest data input requirements of the three. This appears to be a key reason why the SBTi's recently announced pilot portfolio-level temperature tool appears to use only an absolute contraction method to measure the adequacy of company targets and the adequacy of portfolio-level decarbonization pathways. Such an approach does not require knowledge of a company's activity or production level, but only requires one year of absolute emissions data and a target for each company. In addition, the SBTi appears to have become more concerned over time with a perceived risk of GEVA. That is, if a lot of companies have fast activity growth rates, they may appear to be operating within their carbon budget in intensity trend terms, but grow their absolute emissions too fast in aggregate across companies to meet the global Paris-aligned carbon budget.

The SDA not only has an intensity reduction requirement, but also enforces an absolute cap and absolute reduction requirement on emissions for the most consequential high-emitting sectors. Other sectors where only GEVA can be applied are: (1) Not individually consequential in terms of absolute emissions and so are unlikely to bust the global carbon budget by growing company/sector activity and emissions too fast; and (2) With the vast number and unique characteristics of individual economic actors/emitters/sectors, it is highly unlikely that faster than expected activity growth will occur at such a broad-based economy-wide scale that it would be, in aggregate, out of line with the aggregate GDP/activity growth expectations embedded in the relevant climate scenarios.

3. Multi-Asset Class Applications of Trucost Paris Alignment Indicators

A key advantage of Trucost's Paris Alignment dataset is its ability to be applied widely across a range of industries and asset classes in a consistent fashion with directly comparable results. Multiple portfolios with different sectoral compositions, and even different asset classes, can be compared against one another at the aggregated portfolio level and individual constituent levels, without resorting to widely divergent methodologies or having large data gaps.

Trucost has off-the-shelf coverage of equity and fixed income issuers. This coverage can be extended based on an investor's individual needs for alternative asset classes, as long as the issuer is a corporate issuer and has a modicum of data available.

Table 4: Asset class coverage

	Standard coverage	Custom coverage	Potential future standard coverage
Asset class	Public equity Public debt	Private equity Private debt Infrastructure Real estate	Sovereign debt
Apportioning factor	Market value of the holding (equity only investors) or Total Enterprise Value of holding (for debt and equity investors) is typically used	Total capital or Total assets	Gross debt

Source: S&P Global Trucost (2021)

Foundations of the extension of the methodological approach beyond listed assets

In recent years, GHGs and other data required for alignment assessments have become relatively well disclosed across public equity markets, but this is still less prevalent among listed small cap and emerging market companies. They are also much less prevalent in private markets and alternative asset classes.

To address increasing investor demand, particularly from these segments, Trucost recently expanded its Paris Alignment coverage to include the capability to complete assessments for companies where GHG data disclosure is incomplete, and to offer a range of options for investors that operate across non-listed asset classes.

Trucost has also begun to provide an option to clients to provide private data that enables a Paris Alignment assessment of holdings outside the public listed universe.

For asset managers specializing in private equity, private debt and other alternative asset classes, their close working relationships with investee companies can sometimes entail an ability to source data that is not in the public domain, or to request private companies to disclose such data in the public domain for the first time.

Inputs required for custom coverage

There are two ways to provide custom coverage:

1. Trucost collects additional financial/production data for the individual issuers/assets of interest using its own desk research and data available through the S&P Global Market Intelligence platform (which gathers financial data on millions of private companies worldwide).
2. The investor client provides the necessary GHG, sector and financial/production data directly via their relationships with investee companies.

The table below summarizes the emissions and production/financial inputs data that are needed for custom coverage.

Table 5: Issuer data inputs required

Sector	Emissions variable required	Production/financial variable required	Approach
Power generation (including electricity generation project finance)	Scope 1 emissions intensity per unit of production	Power generated (GWh)	SDA
Cement production		Metric tons of cement produced	SDA
Passenger air transportation		Revenue passenger kilometers	SDA
Aluminum production		Metric tons of aluminum produced	SDA
Steel production	Scope 1+2 emissions intensity per unit of production	Metric tons of steel produced	SDA
Paper production		Metric tons of pulp, paper and paperboard produced	SDA
Real estate and mortgage loans	Scope 1+2 emissions intensity per unit production or Scope 1+2 metric tons CO_2 equivalent	Floor area in m^2 or Gross profits (USD) (revenue minus cost of goods sold)	SDA or GEVA
Oil and gas production	Scope 3 use of sold products	Production of oil Production of natural gas	SDA

Table 5: Issuer data inputs required (continued)

Sector	Emissions variable required	Production/financial variable required	Approach
Automobile manufacturing	Scope 3 use of sold products	Passenger kilometers or Vehicle kilometers	SDA
All other sectors (includes private equity and debt) (GEVA)	Scope 1+2 metric tons CO_2 equivalent	Gross profits (USD) (revenue minus cost of goods sold)	GEVA
All sectors including those named individually above (beneficial, but not required)	Target for future emissions reduction or emissions intensity reduction	Target for production growth in output or gross profits terms	SDA/GEVA as applicable

Source: S&P Global Trucost (2021)

Having several years of historical GHG emissions, together with financial or production data for those years, is critical for a transition pathway-based alignment assessment. This is because it measures the adequacy of a rate of change in emissions intensity and emissions over time. Trucost generally considers four years of data history to be sufficient at minimum (e.g., 2016, 2017, 2018 and 2019 data), plus any additional years of available history will be beneficial to improve the quality of the alignment signal. Where available, Trucost includes data from 2012 onward, with targets assessed as far out as 2025. These are expected to be periodically adjusted as time passes, however, to maintain a relatively constant number of years within the backward- and forward-looking horizon.

For private assets, where data limitations are greater, having multiple historical years of data could be replaced by having a published target that the company has committed to for future years. In this case, a minimum of one year of historical emissions and production/financials would be sufficient, and any further years of history would be beneficial, along with a target covering at least four future years.

Table 6: Minimum years of data required for custom alignment assessment

	Years of data required
No target available	Minimum of four years, with further historical years desirable
Target available	Minimum of one historical year plus a target covering four future years, with further historical and forecasted years being desirable

Source: S&P Global Trucost (2021)

Modeling for missing data points

If emissions data cannot be attained from companies, estimates for emissions data can be calculated for missing years, wherein Trucost estimates emissions values over at least a four-year historical period. For this, Trucost needs to receive from the client, or obtain from readily available sources in the public domain, the revenue (% or local currency) from underlying business segments, which are normally in business segment disclosures in most company annual reporting. These would ideally be classified using the North American Industry Classification System (NAICS), or another widely used sector classification system. Gross profit or production data over at least a four-year historical period would need to be received from the client, or through readily available sources, as per above.

It should be noted that this modeled method will provide an indication of alignment but is less reliable than the use of actual emissions data. This is because alignment models are sensitive to the accuracy of GHG data and expected average levels of modeling error can be expected to generate false temperature alignment inferences in some circumstances. These should be used as a last resort where GHG emissions data is unavailable and a signal is required. Trucost can produce such estimates, together with an accompanying confidence score that qualifies the limitations in the data sources relied upon.

Data Confidence Scores

To help support client decisions regarding which data to incorporate for each unique use case, Trucost provides a Paris Alignment Data Confidence Score alongside each issuer's assessment values.

Table 7: Data Confidence Scores

Paris Alignment Data Confidence Score	Historical data	Forward-looking data
A	6+ years disclosed GHG	Target or Capex
B	4+ years disclosed GHG	Trend
C	Modeled GHG	Target or Capex
D	Modeled GHG	Trend
E	4+ years of disclosed/modeled GHG or Target	

Source: S&P Global Trucost (2021)

A key application of this Confidence Score would be to enable individual investors to make informed case-by-case decisions whether or not to include coverage of companies with modeled emissions in their Paris Alignment calculations. For some portfolios and asset classes, coverage may be adequate using only issuers with full disclosure of GHG emissions (Confidence Scores of A or B). This would avoid the need to use supplementary modeled data where the chance of making false inferences on alignment are greater. Whereas, for other portfolios and asset classes with low disclosure of GHG emissions, an investor may wish to apply modeled data to provide an alignment signal where otherwise no signal would be available.

The specific case of infrastructure assets

Selected infrastructure assets would be assessed using the SDA model, for example where the assets are focused on power generation and, in select other cases, using the general economic-intensity based GEVA model. However, infrastructure assets would be covered selectively, and not all types of assets would be covered using these currently available methods. This approach would align as much as possible with the SBTi suggestions (see below).

Table 8: SBTi suggested methods for infrastructure and loans

Asset class	Products and requirement for inclusion in targets	Required minimum coverage for required activities	Applicable methods		
Consumer loan	Residential mortgages	Optional	SDA		
	Motor vehicle loan	Not applicable	Not available		
	Personal loans	Not applicable	Not available		
Project finance	Electricity generation project finance	100% of base activity (kWh)	SDA		
	Other project finance (e.g., infrastructure)	Not applicable	Not available		
Corporate loan	Corporate loan: commercial real estate	Minimum 67% of base year activity (m^2)	SDA		
	Corporate loan: electricity generation	100% of base year activity (kWh)	SDA		
	Corporate loan: other long-term debt (more than one year), excluding electricity	Fossil fuel companies: minimum 95% of base year corporate	SDA, where sector-specific methods are available	SBT portfolio coverage	Temperature rating

Source: SBTi (2021)

Individual near zero emitting assets and companies

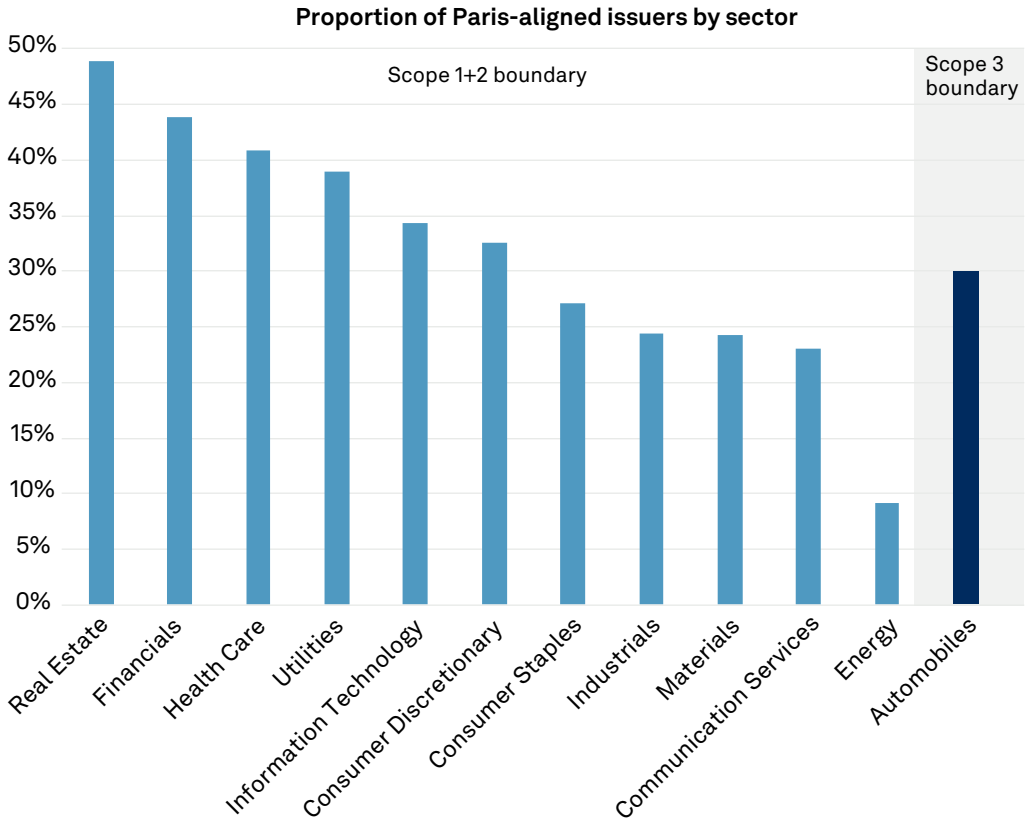
The transition pathway approach of assessing Paris Alignment employed by Trucost works exceptionally well for the vast majority of issuers. Since it is based upon the concept of required reductions in annual emissions intensity and emissions, however, it can provide unintuitive results for companies whose business models are already fundamentally aligned with a low-carbon economy. This can include dedicated renewable power generators, dedicated recyclers of aluminum/steel or real estate companies/assets that have a lengthy history of only using renewable power. These types of entities are unlikely to be able to achieve significant future emissions reduction due to past mitigation actions.

For these types of issuers, Trucost recommends that the assessment considers whether that issuer meets the static emissions-intensity threshold consistent with below 2°C of warming for its industry in 2040. This is consistent with the static level in European Union guidance and recommendations on Paris-aligned Benchmarks and a sustainable taxonomy for alignment for power generators (emissions intensity of <100gCO_2e/kWh).

4. What Does Trucost's Paris Alignment Data Tell Us?

Trucost's Paris Alignment dataset for corporates supports the thesis that significantly greater efforts will be required across the economy to achieve the goals of the global Paris Agreement. More than two-thirds of listed companies assessed are misaligned with the Paris Agreement aim of limiting warming to 1.5–2°C.

Figure 6: Temperature alignment by activity and sector



Source: S&P Global Trucost (2021)

However, diverse results are evident within the overall misaligned picture. A variety of scenario alignment results are evident within each Global Industry Classification Standard (GICS) sector, indicating an ability of investors to identify a significant number of well-aligned corporations among the universe of listed corporations, or avoid holding poorly aligned corporations, while still maintaining a good level of diversification.

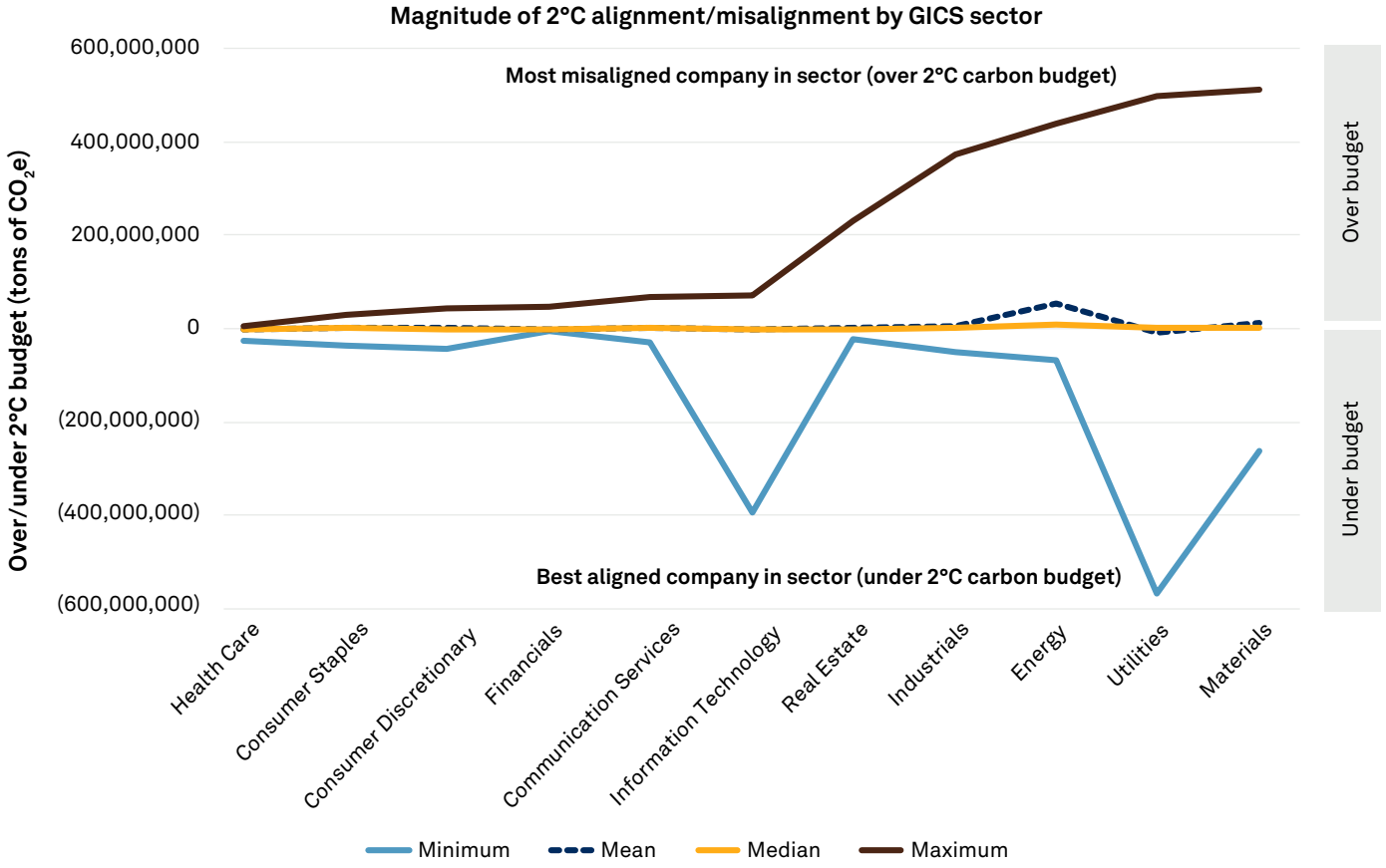
Sectoral differences are notable in the alignment results. Energy sector companies, including companies operating in the oil and gas production value chain, have the weakest level of alignment overall by a significant margin. Materials companies (cement, steel, aluminum) also underperform other sectors.

Better results, in general, are evident for the real estate sector, as well as financial and health care, with typically lower direct emissions. Some new economy technology sectors also show better results, in contrast with old economy heavy industrials and materials sectors, where emissions are generally high and cost-effective abatement technologies have been more challenging to develop. The automobiles manufacturing sector has an average performance, with a third of companies being Paris aligned.

One key element is the significant proportion of utilities that are aligned with the Paris Agreement. This relatively strong performance draws out a key point: some large emitters can be very well aligned under transition pathway assessment approaches, which can seem counterintuitive. High emissions-intensive companies are often the largest targets of investor engagement, as well as broader stakeholder pressure, and some are reducing their emissions sharply. In a significant proportion of these cases, this appears adequate to meet Paris-aligned thresholds. Power generators have, in recent years, been rapidly switching from coal to natural gas, as well as growing their adoption of renewable energy. This adds further context to investors' potential actions from portfolio carbon analysis: a company may be a high emitter, but may also be on a very strong improvement trajectory and paying more than its proportionate share toward achieving the Paris Agreement. Enabling further granularity and nuanced distinctions between carbon intensity and adequacy of decarbonization trajectory is one way that Trucost's Paris Alignment dataset can offer investors value and insights that are largely uncorrelated with signals from other carbon analytics.

Among all sectors, though, there are strong performers that are well under their implied carbon budgets, alongside companies that are significantly misaligned.

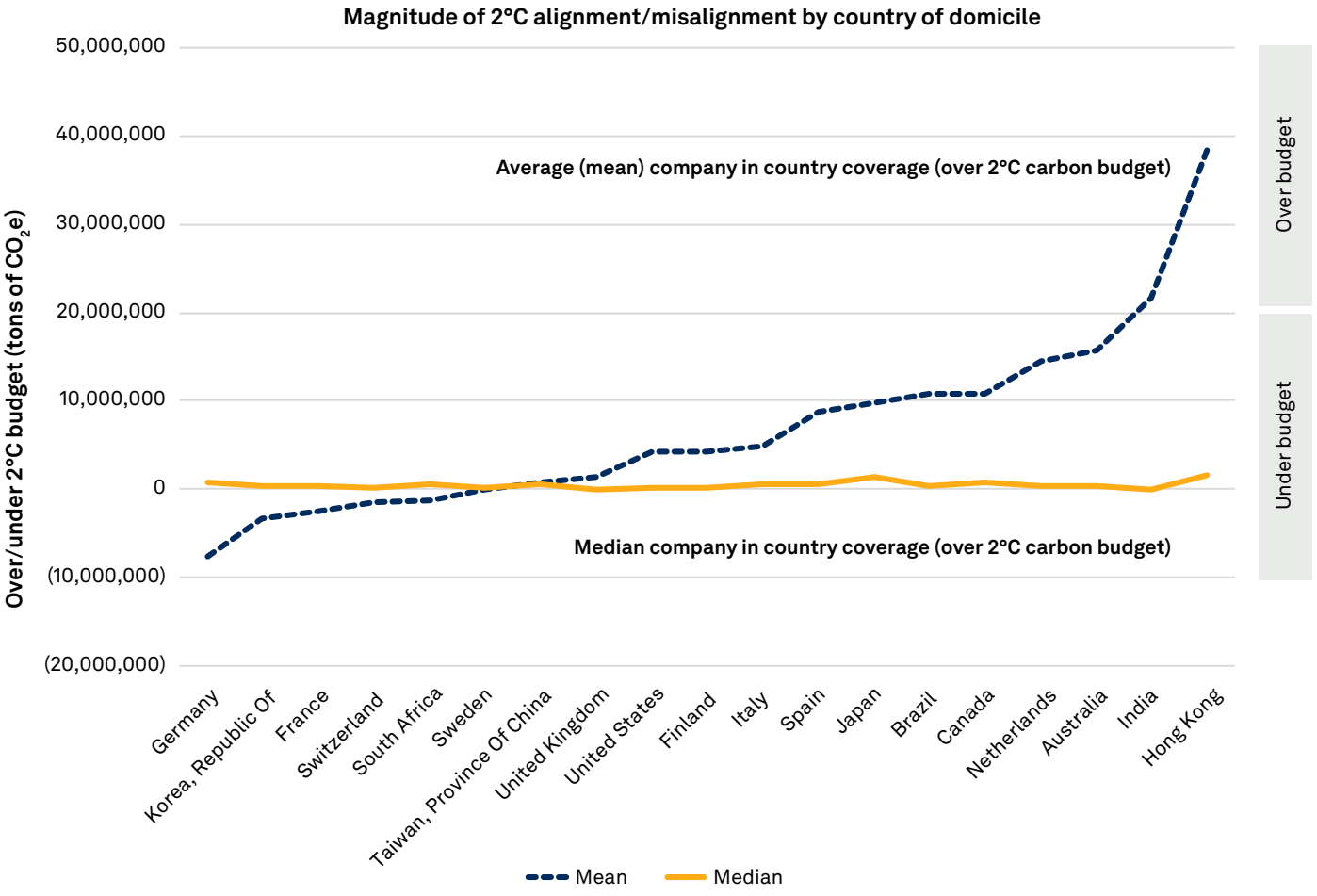
Figure 7: Under/over budget metric — best, worst and average performers by sector



Source: S&P Global Trucost (2021)

Geographic differences are also evident in the results (see below), with a stronger alignment with issuers in developed markets compared with emerging markets. Overall, the greatest misalignment in issuers is generally in emerging markets and those with economies most oriented toward resource extraction or listings of resource extraction companies. Better average levels of alignment are generally evident within countries with more environmental regulations, such as Europe.

Figure 8: Paris Alignment by country and region*



Source: S&P Global Trucost (2021)

*Chart includes only coverage based on full company disclosure (including no modeled variables), and for countries with at least 25 companies fitting this requirement.

5. Investor Applications: Case Study of Natixis Investment Managers Solutions

In a continuous low interest rate environment, institutional investors are increasingly drawn to alternative asset classes, with a focus on illiquid and private assets (e.g., real estate, infrastructure, private debt and private equity). Natixis Investment Managers Solutions[17] recognizes this investor orientation and its impact on climate analytics, and integrates this into investment solutions using Trucost data.

Where temperature alignment methodologies are increasingly used and scrutinized as a way to assess climate impact, managing diversified assets naturally entails crucial challenges. Historically, methodological discussions on temperature alignment have focused on listed assets (listed equity and corporate bonds). Few, if any, providers have covered other asset classes. As a result, most of the climate assessments that have been made at a portfolio level have tended to omit the diversification pocket on grounds that data were non-existent or methodologies inconsistent. Unfortunately, with diversification pockets currently observed to be growing at levels of up to 20% or even 30% of the total allocation, this could lead to significant distortion in the assessments.

The current priority is to make sure that the assessment is able to cover all activities and, in particular, all asset classes. For asset owners as well as asset managers, extending the alignment assessment methodology to private asset classes is now critical for the following reasons:

- **Reporting/regulatory requirements:** Having one unified and consistent methodological approach across asset classes supports better readability of the various assessment results reported in the current required frameworks.
- **Allocation:** Strategic Asset Allocation (SAA) decisions are affected by assumptions regarding both risks and returns. As proportions of illiquid/unlisted assets keep increasing, a SAA that properly incorporates climate risk conceptually requires consistent risk analysis across all those asset classes.
- **Integration:** Based on the "climate-consistent" SAA approach, full and proper climate integration can be achieved at all stages of the asset allocation process:
  - Climate factors can be integrated in fundamental research to better adjust financial forecasts (by identifying additional sources of risks and opportunities) and help make more informed investment decisions.

[17] Natixis Investment Managers Solutions: Natixis Investment Managers Solutions teams, based in several locations (Paris, London, Geneva, Boston), gather the asset allocation, portfolio construction, multi-asset portfolio management and structuring expertise of Natixis Investment Managers. Only the entity based in Paris has the portfolio management company certification.

  - Negative and, more importantly, positive screening can be implemented in the tactical allocation process (again, including in the diversification pocket) with a robust approach, with the investor actively choosing to invest in companies with the perceived best climate performance.
  - Ultimately, a comprehensive, consistent and quantifiable climate framework for all asset classes should help measure and quantify climate impacts along with financial performance.
- **Engagement:** Consolidating data on sectors and stakeholders, which have received little attention due to the private nature of these investments, could prove a significant boon for engaging companies that are invested in the portfolios and challenging their climate record.
- **Risk Management:** The focus on transition and physical risk exposure of the assets in a portfolio is, of course, also key. This is especially the case for illiquid and unlisted assets, which are vulnerable to carbon price risk, reputation risk, technology risk and/or market risk.

Conclusion

Since the adoption of the Paris Agreement, a growing number of institutional investors have decided to align their strategies with the goals of that agreement. They are committed to measure, report and take actions on the alignment of their portfolios with the Paris Agreement. In 2005, Trucost helped design the first ever portfolio carbon footprint report for an equity fund. Carbon footprint calculations serve as a basis for the assessment of company trajectories. Fifteen years later, Trucost is proposing a comprehensive, multi-asset and coherent methodology to help investors assess and report on their portfolio alignment.

Trucost recommends the use of the SDA-GEVA approach. This approach enables investors to analyze almost all asset classes, including both liquid asset classes (e.g., public equities, corporate fixed income) and illiquid asset classes (e.g., private equity and private debt). This methodology also encompasses a number of key advantages, including the use of various sources (targets, asset-level data and past intensity trend) to calculate future carbon emissions. Although challenges remain, in particular with respect to the availability of raw carbon data on private companies, the methodology described in this white paper can be used by any investor looking to align its strategy with the Paris Agreement and report accordingly. Finally, as described in the above case study from Natixis Investment Managers, Paris alignment assessments can be used in the following functions: Strategic Asset Allocation, ESG Integration, Engagement and Risk Management.

Natixis Investment Managers Solutions

Natixis Investment Managers Solutions (“NIM Solutions”) teams, based in several locations (Paris, London, Geneva, Boston), gather the asset allocation, portfolio construction, multi-asset portfolio management and structuring expertise of Natixis Investment Managers. Only the entity based in Paris has the portfolio management company certification.

NIM Solutions is a business development unit of Natixis Investment Managers, the holding company of a diverse line-up of specialized investment management and distribution entities worldwide.

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