Sustainable1

Trucost Paris Alignment

Methodology

S&P Global Sustainable1 – June 2024

Version control/updates:

- June 2024: Enhancements to granularity of target-adjusted greenhouse gas forecasts, expanded targets data collection, edits for clarity
- November 2023: Formatting update; Expansion and addition of certain sections

(see Updates section for details.)

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Introduction and Context

In December 2015, 196 parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached consensus on the Paris Agreement whose aim is to keep global temperature rise well below 2°C above pre-industrial levels by 2100, and 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 data from Climate Action Tracker, even if all governments achieved their Nationally Determined Contributions (NDCs) by 2030, the world will still likely warm 3°C or higher by 2100 – well above the 2°C limit agreed upon.[3]

Scenario alignment data can facilitate capital flows toward a low carbon economy. It does this by allowing investors to determine which companies and sectors are compatible with a below 2°C world and better positioned to withstand potential risks as a result of climate change.

The Trucost Paris Alignment dataset enables investors to track their portfolios and benchmarks against the goal of limiting global warming to below 1.5°C or 2°C from pre-industrial levels, as well as other climate change scenario outcomes. The approach taken can be described as a transition pathway assessment, which examines the adequacy of the rate of emissions reductions over time in meeting decarbonization rates required to meet a range of possible temperature outcomes.

Figure 1: Expected temperature rise outcomes in decarbonization required per annum

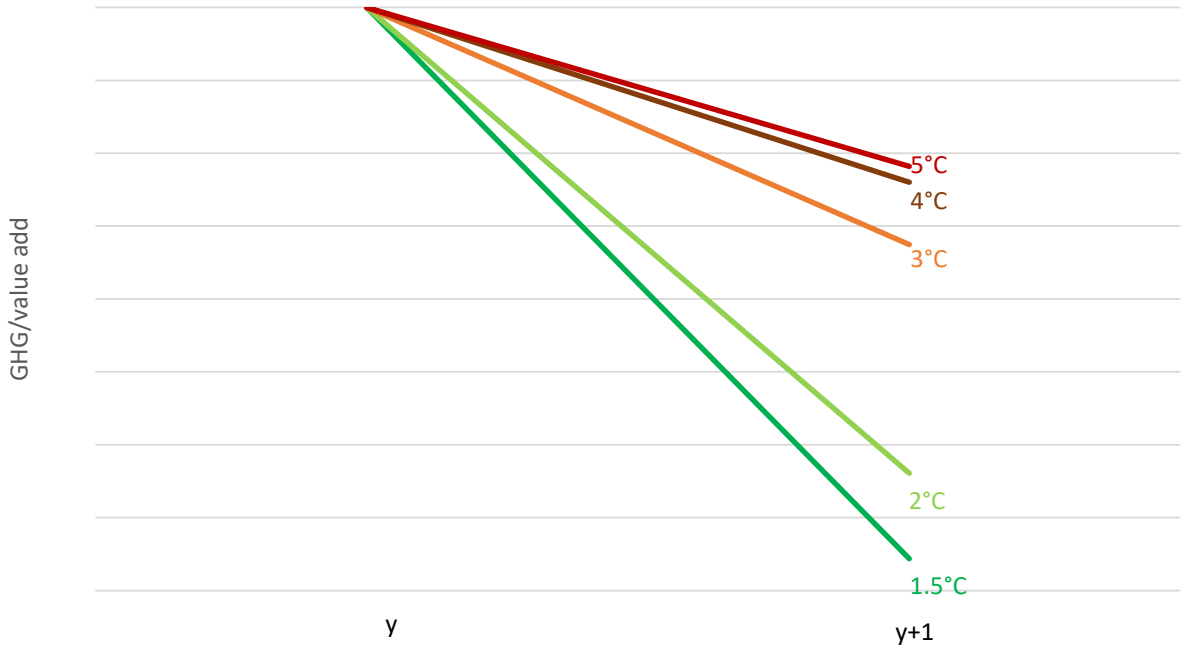

Chart for illustrative purposes only

[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/

It tracks company emissions and activity levels, including forward-looking indicators over a medium-term forecasted time horizon. It is one of several key approaches to Paris Alignment assessment in growing usage today. It allows for the identification of industry leaders and laggards when it comes to the decarbonization rates required to meet global objectives. A key advantage of a transition pathway approach is its ability to be applied across a wide variety of portfolio holdings and aggregated to portfolio-level results, not limited to assessment of one or a small number of sectors or business activities.

An alternative approach, the technology mix approach to Paris Alignment, is limited in its application to business activities with widely disclosed technology mixes, e.g. power generation. This approach is useful for within-industry comparison, but cannot readily be expanded upon or aggregated to a whole-of-portfolio assessment. For this reason, the transition pathway approach was adopted.

To gain a competitive advantage in the transition to a lower-carbon economy, companies around the world are under growing pressure to demonstrate they are reducing emissions consistent with global goals, and have increasingly adopted science-based targets consistent with below 1.5°C or 2°C of warming.

Methodology Overview

The Trucost Paris Alignment assessment adopts two key approaches first published in academic journals to establish what would be reasonable contributions for individual corporations to reduce emissions in line with scientific needs, and set targets reflecting them. These are:[4]

- The Sectoral Decarbonization Approach (SDA)
- The Greenhouse gas Emissions per unit of Value Added (GEVA) approach

These two methodologies are adapted to be scalable from individual company target-setting to assessments of portfolios that may include hundreds or thousands of companies to be assessed.

Output values are produced in terms of alignment with defined temperature ranges (eg. 1.5-2°C), or as a continuous variable in tonnes CO_2 equivalent under or over a budget associated with a given temperature (eg.1,234,000 tCO_2e over a 2°C budget over the time horizon of the assessment).

These approaches are consistent with key recommendations by regulators, collaborative investor bodies and NGOs such as:

- European Union Paris Aligned Benchmarks requirements
- Task-force on Climate-related Financial Disclosures (TCFD) portfolio alignment recommendations
- The Institutional Investors Group on Climate Change (IIGCC) net zero investment framework
- Science Based Targets Initiative (SBTi) target setting requirements for some high emitting sectors.

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 Paris aligned scenario by 2050 from their unique starting points. It uses industry-specific Paris aligned scenario pathways, with companies measured using industry-specific emissions intensities and physical production levels (e.g. tCO2e per GWh or per tonne of steel). Industry-specific transition pathways may be faster (e.g. power generation), 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 a low base year emissions intensity and low production growth can reduce emissions at a gradual rate. Companies with a high emissions intensity or high production growth must make faster reductions.

The scenarios used in SDA assessments are International Energy Agency (IEA) scenarios from its Net Zero and Energy Technology Perspectives (ETP) 2017 publications. These provide SDA assessment parameters consistent with 1.5°, 2°, and 2.7°C of warming.

[4] 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.

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 which 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 scenarios, and emissions intensities with a financial, not physical or production denominator. Each company's transition pathway is measured as its GHG emissions per unit of inflation-adjusted gross profit, 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 Shared Socioeconomic Pathway (SSP) scenarios used prominently in the sixth assessment report (AR6) of the Intergovernmental Panel on Climate Change (IPCC). These provide GEVA assessment parameters consistent with 1.5°, 2°, 3°, 4°, and 5°C of warming. The 1.5°C scenario parameter is also consistent with the requirements of the European Union's Paris Aligned Benchmark regulations.

GEVA Modelled Approach

This variant applies the GEVA Approach but enables additional issuer coverage by including issuers that did not disclose some relevant historical years of greenhouse gas emissions. In their place, this variant of the GEVA Approach includes values modelled (estimated) by Sustainable1 for one or more historical years in the GEVA assessment. Modelled data has limitations and can differ from actual emissions values, and for that reason its use is flagged within the dataset.

GEVA Modelled including Constant Intensity Approach

This variant applies the GEVA Approach but enables additional issuer coverage by including issuers that did not disclose some relevant historical years of greenhouse gas emissions for which modelled (estimated) emissions by Sustainable1 were also unavailable. In their place, this variant of the GEVA model assumes an unchanged emissions intensity for any year with missing emissions data, relative to a nearby available year of emissions. Modelled data has limitations and can differ from actual emissions values, and for that reason its use is flagged within the dataset.

Data Sources

Transition pathways assessed incorporate both historical and forward-looking data in order to provide an assessment that has a medium-term outlook. This minimizes the uncertainties involved in using only forward-looking data, and is of a sufficient time horizon to make the effect of any year-to-year volatility less significant. Historical data on greenhouse gas emissions and company activity levels is incorporated using a minimum five year historical baseline, or the year of first full greenhouse gas disclosure earlier if this was earlier. Forward-looking data sources are used to track likely future transition pathways beyond the most recent year of disclosed data over a medium-term future period. Forward-looking data is incorporated based on an established data hierarchy made up of the following sources:

- Disclosed emissions reduction targets published by CDP or identified by S&P Global research[5], or if not available then;
- Asset-level data sources that provide signals of potential future changes in production from high-emitting sources, or if not available then;
- Company-specific historical emissions trends for companies assessed on the basis of homogeneous business activities (SDA),
- Sub-industry average historical emissions trends for companies assessed on the basis of heterogeneous business activities (GEVA), or if not available then;
- No change in emissions intensity.

The dataset uses combined Scope 1 and Scope 2 emissions as the assessment boundary. Scope 1 emissions are based on the Kyoto Protocol GHG emissions from sources that are owned or controlled by companies. Scope 2 accounts for GHG emissions from the generation purchased electricity, steam, heating and cooling consumed by companies.[6]

[5] Target-based forecasts sometimes make use of a single company-disclosed GHG target, or where relevant make use of multiple company-disclosed targets relating to different scopes of emissions, or different horizon/end years for a given company.

[6] The Greenhouse Gas Protocol, "A Corporate Account and Reporting Standard" https://ghgprotocol.org/sites/default/files/standards/ ghg-protocol-revised.pdf

Data Confidence Scores

The Paris Alignment Data Confidence Score is a value of A, B, C or D, representing how much underlying company-disclosed historical greenhouse gas emissions data and forward looking emissions reduction target data was available to be incorporated into an issuer's Paris Alignment assessment, relative to modelled underlying data. Score A represents the greatest standards of disclosure and highest confidence in final °C assessment values, while D represents the lowest confidence.

The score differentiates issuers on the basis of three criteria:

- Disclosed historical Scope 1 and 2 greenhouse gas emissions data is incorporated into the Paris Alignment dataset covering at least the past five historical years
- Only disclosed historical Scope 1 and 2 greenhouse gas emissions data, and no modelled historical data, is incorporated from the earliest possible baseline year used in the Paris Alignment dataset through the latest historical year
- A disclosed greenhouse gas emissions reduction target has been identified and is incorporated as the Paris Alignment forecast data source

Issuers are scored as follows:

A	All three of the above criteria are met
B	Two of the above criteria are met
C	One of the above criteria are met
D	None of the above criteria are met

Portfolio Applications

Apportioning and defining alignment

Paris Alignment metrics can be aggregated and apportioned at the portfolio level to understand portfolio alignment with defined temperature scenarios and the apportioned emissions above or below a given temperature scenario budget. The overall alignment of a portfolio is defined through apportioning the value of holdings in regards to the 'tCO_2 (under)/over 1.5°C budget' and/or 'tCO_2 (under)/over 2°C budget' metric that is produced each year for every company. This is calculated by multiplying the 'tCO_2 (under)/over 1.5°C budget' and/or 'tCO_2 (under)/over 2°C budget' figure by the investor's value of holdings and then dividing this value by either the total enterprise value or total market capitalization of that particular company. The individual values are then summed across the entire portfolio in order to either give a negative figure (aligned, under budget) or positive figure (misaligned, over budget).

Inputs

To calculate a portfolio-level Paris Alignment Assessment, just two inputs are required from our clients:

- Company identifiers (e.g. ISIN)
- Value of holdings or weights and the total value of holdings.

Monitoring and Review

All new methodologies and any material changes to existing methodologies are reviewed and approved by an independent methodology governance committee.

Assumptions and Limitations

Baseline year: The results are sensitive to the chosen baseline year, particularly for companies where there is significant volatility in emissions or other contributing factors like production levels or gross profits year on year. Significant corporate events like M&A activities can also influence the results.

Future horizon year: There are advantages to including a longer time horizon in the alignment assessment - notably greater perceived visibility and transparency - but also disadvantages – notably greater uncertainty, potential errors and false sense of certainty involved in extending scenario and emissions forecast horizons. The time horizon of the alignment assessment was selected as a suitable balance of these factors given reasonable coverage of and confidence in available forward indicators of likely future emissions.

Volatility in underlying data: The GEVA approach is sensitive to changes in its denominator value, namely company value added calculated as inflation-adjusted gross profits, which is more volatile at company and sector level than GDP, the sum of value added across the global economy that it proxies. Elements like changes in exchange rates, commodity and product prices, and company specific factors contribute to year-on-year volatility. The relatively short historical time horizon accentuates this issue, relative to a longer period that might show a clearer trend. Incorporating earlier years was not seen as viable as lack of disclosed data began to sharply reduce the company coverage universe if an earlier baseline year was chosen.

Non-disclosers: Paris Alignment data coverage is provided for companies in the Trucost Environmental dataset. While disclosed data is the preferred source for GHG emissions data inputs, to enhance the GEVA coverage, it also covers companies with modelled instead of disclosed data, and companies with emissions data gaps for some reporting years. These gaps are bridged through assuming a constant year on year carbon intensity based on data availability from previous or subsequent years. S&P incorporates a minimum of four years data history in addition to the most recent year of emissions data available, whatever its source (disclosed, modelled, assumed constant intensity). This enables a medium-term trend to be discernable from whatever the best data is available for a given company, as well as placing a limit on the use of modelling assumptions in cases where they are significant. This allows us to analyze the majority of the research universe with a minimum baseline four years earlier than the current most recent year available, while including greater data history and a longer trend through an earlier baseline for a subset of companies where that longer trend adds to the robustness of the trend without adding unnecessary modelling assumptions. So that clients can best interpret the quality of the data embedded, confidence scores accompany the assessment value for each issuer covered. The confidence scores range from A (highest quality) to D (lowest quality), allowing clients to interpret the extent of modelling assumptions that were required to produce an assessment result.

Scope of emissions: The power generation, airlines and cement industries when covered under the SDA are assessed based on Scope 1 emissions only, which is the scope of the scenario data they are assessed against, and which by convention is the scope these companies disclose their emissions intensities and represents the bulk of these industries' emissions. The steel and aluminum industries, as well as all companies assessed using the GEVA approach use Scope 1 and Scope 2 emissions.

Double counting: There is some inevitable double counting across companies based on the scopes of emissions included, most notably between power generators and power users. On balance, Scope 2 emissions were included for greater consistency with carbon footprint results, and because for a number of industries Scope 1 emissions alone are insubstantial to their overall footprint. Scope 3 data is omitted from the assessment boundary because of the lower proportion of issuers disclosing such data, less consistency in Scope 3 disclosures between companies or between years for disclosing companies, and greater limitations in modelling Scope 3 than Scope 1-2.

Avoided emissions: The dataset does not incorporate avoided emissions or other environmental benefits stemming from companies' operations. Some companies, though they may have substantial emissions, may have products that contribute to the avoidance of still higher emissions elsewhere in the economy, or other positive benefits that may help the world achieve global climate goals. With an analytical boundary of Scope 1 and Scope 2 emissions only, these factors are not taken into consideration.

Updates

June 2024:

- Inclusion of reference to enhancement wherein greenhouse gas forecasts can be based upon more than one target per scope of emissions wherever relevant.
- Inclusion of reference to expanded greenhouse gas target sourcing from S&P Global's own data collection to supplement sourcing from the CDP questionnaire.
- General clarifications for clarity and ease of reading.

November 2023:

- Inclusion of reference to use of IEA net zero scenario and IPCC-affiliated shared socioeconomic pathway scenarios, replacing representative concentration pathway scenarios.
- Addition of section on Data Confidence Scores.
- Expansion of section on GEVA approach, to include 'GEVA Modelled Approach' and 'GEVA Modelled including Constant Intensity Approach'.

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