Scenario Alignment

Description of the Methods and Assumptions Used

ISS STOXX's detailed Climate Scenario Alignment enables clients to assess the potential business implications of climate change, as suggested by the Task Force on Climate-related Financial Disclosures ("TCFD"). The methodology follows the recommendations by GFANZ (Enhancement, convergence and adoption measuring portfolio alignment, dated August 2022).

Carbon budgets are allocated for each issuer based on a "fair-share" approach as recommended by GFANZ using the intensity ratios of the issuer compared against the appropriate benchmark. Intensities are based on physical production whenever possible, with a fallback on an economic denominator substitute otherwise. The benchmark is calculated from a given scenario, and the scenario alignment solution covers a multitude of scenarios from different providers such as the International Energy Agency (IEA), Network for Greening the Financial System (NGFS), and The United Nations Environment Programme's partnership with the University of Technology Sydney's One Earth Climate Model (OECM). On the other side of the equation, the emissions of the issuer are projected based on several approaches such as historical, scenario benchmark, or target inclusion. The comparison between the projected emissions and the carbon budget allows for a cumulative alignment comparison both at a medium-term horizon of 2030 or a long-term horizon of 2050. When baseline emissions of the issuers are not covered, modelled emissions are leveraged.

Scenarios Descriptions

The first step to scenario alignment is choosing the correct scenario, and therefore the Scenario Alignment Solution allows for the selection of a range of various scenarios each not only different in their implied temperature trajectory but in the assumptions behind their modelling. The scenarios used in solution are based on five distinct Integrated Assessment Models (IAM) from providers such as IEA, NGFS, and OECM. These scenarios cover a range of implied temperature rise from 1.5°C to 3°C +. Below are a couple of key differences in the modelling approach and similarities that these scenarios have.

While each provides a 1.5°C aligned scenario labelled as Net Zero by 2050, scenarios assume various levels of cumulative carbon budget for their Net Zero pathways. Some scenarios may have a lower probability of reaching 1.5°C, may rely on more negative emissions before the end of the century, and may allow for higher temperature overshoot in the medium term (i.e., exceeding 1.5°C temporarily). The climate scenarios also take into account Shared Socio-economic Pathways (SSPs)[1]. SSPs are

[1] https://unfccc.int/sites/default/files/part1_iiasa_rogelj_ssp_poster.pdf

narratives which include projections for economic and population growth, which are key drivers of energy demand. Both IEA and NGFS follow a Shared Socio-Economic Pathway of SSP2, while OECM takes SSP1.

The five models offer a wide range of technology assumptions and enable financial institutions to shape their lending, investment, and insurance activities, and related services, in line with their expectations of what a net-zero transition may entail within specific sectors. There is relative consensus on two fundamental elements of the energy transition, namely the rapid phase down of fossil fuel usage and the expansion of renewable energy. However, some other technologies are deployed differently among pathways.

Models also have different regional granularity with IEA NZE publishing two regions (Advanced Economies / Emerging Markets and Developing Economies) as opposed to GCAM NGFS which publishes 32 for example.

The difference in each scenario is reflected from varying upstream model outputs and subsequentially in resulting alignment metrics such as Implied Temperature Rise (ITR). The plurality of scenarios allows for the contextualization of each result and comparison across the scenarios and distinct modelling approaches of each provider. However, to enable such a feat, a common mapping of sectors and regions needs to take place. Wherever possible, public sourced variables have been kept unaltered. For cases where this was not possible, variables were "expanded" to align the various scenarios to a common comparison ground. Nevertheless, to encourage efforts towards more transparency of scoring methodologies, an expansion degree taxonomy has been created and a specific factor details the degree of expansion that was required.

Analysis Time Horizons

The analysis is performed cumulatively for a medium-term time horizon of 2030 and a long-term time horizon of 2050 with a baseline of 2020, resulting in output factors such as cumulative alignment and Implied Temperature Rise (ITR) metrics for both periods. However, carbon budgets and emissions projections are calculated yearly.

Emissions Scope Coverage

Scenario Alignment has been updated in Q1 2025 to provide two versions of the same issuer-level dataset. One includes all scopes, from 1 to 3, while the other covers all direct operations related emissions, scope 1+2. The methodology followed for both datasets is identical, and they differ solely on the exclusion or inclusion of scope 3 emissions.

Research Process

Data Source and Cycle of Update

The solution draws upon multiple sources. The main sources are listed below, with the documentation links provided. The solution uses three main bodies of scenarios, emissions data, as well as financial parameters by third party providers.

INTERNAL / EXTERNAL	NAME	USAGE	UPDATE CYCLE
External	IEA WEO 2024 IEA WEO 2025	Scenario	Annual
External	NGFS Phase 5[2]	Scenario	n/a
External	OECM 2023[3]	Scenario	n/a
External	U.S. Energy Information Administration (EIA)	Electricity database	Annual
Internal	Carbon Footprint	Emissions	Annual
Internal	Energy & Extractives	Fossil Fuels Production and Electricity generation	Annual - Weekly update to catch any amendments
External	Third party vendor	Financial Data Geographic Distribution of Property, Plants and Equipment Sector Classification	Daily (company report quarterly basis) Daily
Internal	Environment & Social Raw Data	GHG Reduction Target Data	Quarterly

- Emissions database: A summary of the process is provided below:
  - Self-reported emissions data is collected from all available sources on an annual basis.
  - Self-reported numbers are evaluated for trustworthiness and, where necessary, discarded.
  - All companies are classified according to their carbon-profile, allowing ISS STOXX to benchmark non-reporting companies against their reporting peers.

[2] The ISS data incorporates data obtained from the Network for Greening the Financial System ("NGFS"). The NGFS material is subject to a public license. The NGFS material is available at the following URL: https://data.ene.iiasa.ac.at/ngfs and NGFS Climate Scenarios for central banks and supervisors - Phase V | Network for Greening the Financial System

[3] Teske, S., Rispler, J., Niklas, S. et al. Net-zero 1.5 °C sectorial pathways for G20 countries: energy and emissions data to inform science-based decarbonization targets. SN Appl. Sci. 5, 252 (2023). https://doi.org/10.1007/s42452-023-05481-x

- ISS STOXX applies its 800 sub-sector specific models to estimate the emissions of non-reporting companies according to sector-relevant financial or operations metrics.
- Scope 3 emissions of each company are assessed based on the sector profile of the company.
- Emissions of holdings are allocated to the portfolio according to an investor ownership logic. To ensure compatibility with other providers and TCFD recommendations or PCAF, multiple other metrics may also be applied.
- Quality assurance: If ISS STOXX's analysts, after manually reviewing the data, do not find the self-reported numbers to be reliable, estimated emissions numbers will be used instead.

Energy & Extractives assessments are updated annually as well as on an ad-hoc basis in case of relevant corporate actions (e.g., mergers, acquisitions). ISS STOXX's Energy & Extractives research process can be broken down as follows:

- Risk assessment: Classification of industry by risk to fossil fuel extraction, power generation and related services, and the review of third-party data and reports.
- Research: Review of corporate disclosure such as regulatory filings, sustainability reports, press releases, investor presentations, company websites, and other company disclosures. Third-party information such as government sources, industry databases, and reputable newspapers are cross-referenced as supplemental to company disclosures. All assessments are based on publicly available information, with corporate reporting being the primary source. The screens collect financial and non-financial metrics, which can be quantitative as well as qualitative in nature, to provide clients with a full suite of data to inform their investing strategies.
- Quality assurance: All significant changes as well as new assessments are peer-reviewed, and company dialogues are initiated if key information is not disclosed.

Use of Estimated Data

The Climate Scenario Alignment Solution is dependent on multiple upstream data points such as emissions, financials, and production which can each include estimation. Therefore, the scenario tool will inherit these estimated data points. Additionally, each scenario provides a different level of granularity and taxonomy, and certain pathways are expanded to ensure comparability across the solution. This is expressed through the expansion degree factor. Finally, the projected emissions are an estimation model that is either reliant on (1) historical data, (2) scenario data or (3) company target disclosures.

Estimation Model

Measuring Climate Scenario Alignment

The Scenario Alignment Solution serves as an analytical tool, on both the portfolio and issuer level, where issuers' projected future emissions are compared against scenario trajectories to assess the portfolio or issuer level of alignment with a wide range of possible futures, including ones aiming at achieving the Paris Agreement goals. The analysis is broken down into two elements, calculating the carbon budget of an issuer, and estimating the issuer's projected emissions.

Carbon Budgets

The ISS STOXX Climate Scenario Alignment Solution is based on the Sectoral Decarbonization Approach (SDA), developed by the Science Based Targets initiative. The SDA utilizes scenarios and assigns carbon budgets to different sectors. Companies are responsible for reducing emissions in their respective sectors to achieve absolute emissions reduction targets by 2050 and receive a proportion of their sector's budget based on a fair-share approach as described by GFANZ. Where issuer and scenario data allow, carbon budgets are also allocated on a regional basis, acknowledging the Paris Agreement principle of "*common but differentiated responsibilities and respective capabilities, in the light of different national circumstances*" (Article 2.2).

Emissions Trajectories

The climate scenario alignment solution allows for different projection methodologies to contextualize the trajectories of a portfolio or issuer Scope 1, Scope 2, and Scope 3 absolute GHG emissions. A historical approach extrapolates the trend of the issuer's past emissions, stripped of any modelling assumptions, while a scenario benchmark incorporates market and sector dynamics foreseen in currently implemented policies. Finally, a target inclusion allows for disclosed ambitions to be reflected in the relative alignment metrics, and used in conjecture with the other two methodologies, provides an extensive framework of analysis.

Implied Temperature Rise

The Implied Temperature Rise (ITR) is a forward-looking alignment metric which captures the performance of a portfolio or issuer against a given scenario. The temperature rise is calculated based on the remaining budget of the scenario and its implied baseline temperature, and the temperature difference that an under or overshoot from the issuer or portfolio would result in. The ITR assumes that the rest of the economy would under or overshoot the global remaining carbon budget by the same fraction. The ITR is an easy-to-interpret and to communicate metric which can facilitate comparison across portfolios and issuers. The ITR aims at comparing issuers in different sectors, and regions in a consistent manner. Yet, one should be mindful of the number of assumptions and computations required to derive such metric.

Use of Estimated Data by Dependencies

Scope 1, 2 and 3 Emissions database: For companies which do not disclose emissions, and those who report with a low trust metric (according to internal analysis conducted by ISS STOXX), emissions data is modelled.

ISS STOXX's Energy and Extractives data primarily leverages company reported data. Should disclosure be insufficient or inadequate, information regarding the degree of involvement of an issuer in certain activities will be estimated. This is largely a result of significant differences in reporting quality, standards, and requirements between the companies in Energy and Extractives' large universe. While company reported data is in most cases used as the starting point, as part of the standardization process this is aligned with the definitions applied in Energy & Extractives to ensure the comparability, consistency, and comprehensiveness of the research results.

Overall, approximately 70% of the assessments within the Energy & Extractives coverage universe contain some calculated/estimated data. As noted above, this figure can differ depending on the individual company's reporting quality, standards, and requirements. In some cases, where a company provides granular, high-quality reporting, an Energy & Extractives assessment may be significantly based on company reported data. Where this is not the case, an Energy & Extractives assessment will contain more calculated/estimated data, based on the more limited company reported data that is available.

Please refer to the respective methodology documents for further information.

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ISS STOXX delivers world-class research, data, and technology solutions that empower capital market participants to pursue their visions with confidence. Our expertise spans indices, corporate governance, sustainability, cyber risk, and fund intelligence, giving clients the tools they need to uncover opportunities, manage risks, and navigate evolving regulations. We are made up of 4,000 professionals operating across 20 countries and serving approximately 5,000 clients, including many of the world's leading institutional investors. Our scale and reach give us deep market knowledge, while our innovative methodologies allow us to offer our clients tailored insights that drive impact and success.

ISS STOXX Sustainability enables investors to develop and integrate responsible investing policies and practices, engage on responsible investment issues, and monitor portfolio company practices through screening solutions. It also provides climate data, analytics, and advisory services to help financial market participants understand, measure, and act on climate-related risks across all asset classes. In addition, our Sustainability solutions cover corporate and country research and ratings enabling its clients to identify material social and environmental risks and opportunities. Sustainability solutions are provided by Institutional Shareholder Services Inc., an investment adviser registered under the U.S. Investment Advisers Act of 1940.