
Sustainability Data Governance and Oversight in Asset Management A Primer

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State Street Global Advisors uses a wide range of sustainability datasets, metrics, indicators and tools to power quantitative scoring models and reports, to answer to regulatory requirements, and to drive engagement and stewardship activities where appropriate. In this piece, we discuss how we assess the robustness, correctness, precision, and trustworthiness of our data.

State Street Global Advisors has built granular processes and standardized systems to provide ongoing data quality controls, including robust reporting and to oversee the correct deployment of models. We also aim to standardize data distribution to all internal stakeholders, which helps us to avoid discrepancies and inconsistencies when handling or displaying results. This primer provides a high-level overview of some of our main governance, management, and oversight practices, such as:

- Pre-onboarding and scrutinizing new datasets
- Performing ongoing management of data updates
- Overseeing the employment of data points as drivers of models and scoring mechanisms
- Distributing metrics appropriately to internal stakeholders

By having clear governance and oversight processes in place that can identify and correct potential mistakes before erroneous data is employed, we can help ensure that our clients' objectives are being met as intended.

Due Diligence on New Data, and Testing and Selection of Datasets

When deciding whether to employ a new dataset or tool, the State Street Global Advisors Sustainable Investing Research and Data team engages with vendors' data and technical teams. We acquire information on the capabilities and peculiarities of the dataset/tool. We also explore how the information could be onboarded, learn how the vendor would provide recurring updates and fix potential issues and mistakes, and evaluate sample dataset files to get acquainted with the information, metrics, and indicators.

To determine whether to move forward with contractual negotiations, the Sustainable Investing Research and Data team poses key questions, including the following:

- How many data products does the vendor support?
- What is the core methodology of the dataset/tool, and can the vendor provide solid and thorough documentation?
- What is the coverage for each data product?
- What is the time series for each data product?
- What is the size of the analyst team? Average tenure?
- How is the analyst team organized? By industry, sector, region, or other?
- How does the methodology identify peer groups? By industries, regions, or other?
- Which industry classification does the provider use to group and normalize the data?
- Does the vendor provide a FactSet feed and raw data?
- Is additional data available through other platforms?
- Does the vendor have a proprietary web-based screening tool?
- Does the vendor have a proprietary carbon footprint screening tool?
- Could the vendor provide us with information on estimation methodology? Is there accompanying documentation?

- What is the vendor's relationship with the companies it evaluates? Does the provider receive any sort of compensation from them? What is the procedure when a company objects to the vendor's findings?
- Does the vendor supply data for fixed income products? Public and private equities? Sovereign debt? Securitized debt? Municipal debt? What about other asset classes?
- What percentage of their indicators is made up of quantitative metrics instead of qualitative issues and Boolean yes/no factors?
- Is there a system in place to evaluate data integrity and review analysts' work?
- What percentage of data is taken from a company-related source and delivered without further investigation?
- Does the vendor normalize historical scores? How is that process integrated into scoring models?
- Does the vendor notify data subscribers about changes in data feeds, structure, delivery, or methodology? How often?
- When the vendor conducts primary research and holds in-person meetings or calls with company representatives, is there a systematic approach to data collection and company engagement?
- How often does the vendor update company research and ratings? Daily? Weekly? Monthly? Annually?
- Commercial questions: Are there fees for access points? What are data delivery protocols?

These questions help us make a final assessment of the vendor's capabilities. From there, the Sustainable Investing Research and Data team works alongside the State Street Global Advisors Procurement, Legal, and Market Data Services team to obtain favorable contractual agreements with the vendor, and to make sure that all required use cases for the data or information are included in the finalized contract.

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Data Onboarding and Implementation

The Sustainable Investing Research and Data team works closely with the State Street Global Advisors Information Technology team to onboard, maintain, update, and oversee all sustainability data that is stored in the firm's centralized research database, known as the production database. All external sustainability information is uploaded to the production database using feeds from the vendors. The feeds occur on a recurring basis (usually monthly or quarterly).

The teams validate results and perform analysis to make sure that data is loaded and stored correctly, mapping logic is sound.

Onboarding the Data

When introducing a new or modified dataset, our Sustainable Investing Research and Data team imports the new information into the database "sandbox" or testing environment. This information features raw data (including historical data), information to map the data to various market identifiers (see discussion of "Views" below), built-in logic for time-series data, and data processing logic such as data normalization.

Once the Sustainable Investing Research and Data team signs off that data has accurately been transferred into the firm's systems, the IT team has a green light to transpose the views into State Street Global Advisors' "live" production environment. The IT team also builds automated feed loading or data replication procedures, as well as schedule loader and monitoring jobs, to eliminate manual processes as much as possible.

The Presentation of the Data

The production database contains both tables and views. The main difference between the two is that tables store the physical data that largely reflects the original formatting and information contained on data feeds directly shared by external vendors. By contrast, views are "treated" with conceptual layer logic for end users, which incorporates specific processes, mapping dimensions (for example, mapping to multiple holding-level or company-level identifiers), dating conventions (for example, listing each monthly update using a specific business day for ease of use and consistency), and potentially point-in-time reasoning or other treatments and criteria. Views are built to standardize data usage across several platforms, systems, and asset classes, and to make it easier for users to leverage the information in a comprehensive, robust, and consistent manner.

Feed loaders are automated to onboard new information at a set frequency, and to populate tables and views in the firm's Sustainable Investing Research database. There, views have been set up to map all of the data points to various identifiers (including ISIN, CUSIP, SEDOL, FactSet Permanent IDs, and Bloomberg Company IDs), and to equity and fixed income holdings. The information in the views is then piped to needed downstream users and applications, including investment team and portfolio management tools, risk management and client reporting platforms, and FactSet and Bloomberg uploads. All of those different applications and tools receive the information from one centralized location, known as "the production database," to maintain consistency, integrity, standardization, and robustness, and to avoid any potential discrepancy in terms of hierarchical corporate ownership information, as well as dating conventions.

The Procedure for Vendor Updates

If vendors update methodology or data structure, notifications are sent to the Sustainable Investing Research and Data team before the production change (lead time for changes is estimated at three months). This lead time allows the team to assess the business impact and the required IT changes. If the change is related to feed file format, we also recommend sample files along with the notifications to enable the IT team to test updated codes in a development environment. The Sustainable Investing Research and Data team will also ask the vendor for historical data that has been adjusted with the new methodology or new data points.

4 Model Transparency and Supporting Collateral

Each quantitative model, scoring mechanism, or similar tool from the Sustainable Investing Research and Data team is supported by thorough and transparent collateral, including specific methodology documents that guide readers through the rationale and function of the model. Other supporting documentation includes FAQs for clients and internal stakeholders, as well as marketing papers identifying the scope and purpose of the model, the breadth of its capabilities, the pros and cons of the model, and recent or planned updates or enhancements.

Some calculation and modeling decisions remain proprietary to comply with external vendors' contractual agreements and to protect the firm's intellectual property. Even so, the Sustainable Investing Research and Data team is able to provide extensive transparency around our models.

We write comprehensive methodology guides and update them under a standard cadence, as well as any time modeling changes or enhancements that occur. In addition to those key documents, the Sustainable Investing Research and Data team has released high-level primers and introductory papers, which aim to distill key highlights as well as the reasoning, goals, and primary use cases behind each model.

Other collateral includes custom and bespoke client-facing presentations, which apply specific data and models to particular universes or portfolios. We also provide clients with FAQ guides and more practically oriented papers that focus on empirical analysis and pragmatic evidence, as well as comparative analysis such as deltas in coverage or correlations between different models and vendors.

Gap Filling

Most sustainability data in the production database is not altered or modified compared to the feeds received directly via sFTP or similar channels from external data vendors. However, the Sustainable Investing Research and Data team consults with the firm's investment teams to discuss the potential need for the adoption of "gap-filling" techniques. These might be necessary if specific datasets or metrics have subpar or lower than necessary coverage, thereby necessitating estimations of data for certain holdings. Gap-filling techniques are applied to several widely used climate metrics. Indeed, the Sustainable Investing Research and Data team may choose to generate estimated or proxy data to code into the production database. This may occur after comprehensive discussions between the Sustainable Investing Research and Data team, the IT team, and all internal downstream users.

All null data treatments are carefully reviewed and discussed by Sustainable Investing Research and other Investment Research teams. The current gap filling methods are as following:

- 1 Use median as proxies for Carbon and Brown Revenue metrics. For instance, the IT and Sustainable Investing Research and Data teams have been generating Global Industry Classification Standard (GICS) sub-industry median results that can be plugged in as proxies for climate data providers' specific indicators and used by Equity teams. And NACE medians are preferred by Fixed Income team due to data coverage and regulation considerations. Then, the generated median proxies are used and shared in conjunction with standard climate data to all downstream applications and other internal data users who adopt the same rationale.
- 2 For Green Revenue and Fossil Fuel metrics, companies that do not receive a result directly from the vendor are assigned a zero numerical result.
- 3 For Forward Looking metrics, generally no gap filling method is recommended, therefore missing data remains as null in the process.

Additional Metrics and "Views"

State Street Global Advisors may implement its own calculations to create additional data points that we deem useful for our investment teams.

EVIC

After consulting with several investment teams, the Sustainable Investing Research and Data team in 2022 decided to create Enterprise Value Including Cash (EVIC) normalized greenhouse gas (GHG) emissions results when the data is not available from data vendors. Most vendors provide carbon emissions data that is normalized by market cap or by revenue. However, more recently, regulations and frameworks such as the Task Force on Climate-Related Financial Disclosures have moved to prioritize intensity metrics with EVIC as the denominator.

EVIC is an upgrade to traditional market cap data for several reasons. Primarily, EVIC makes it possible to have a more accurate and more comprehensive representation of a company's total value. Since enterprise value also takes into account the amount of debt that the company has taken on, it can be more easily employed for fixed income and multi-asset strategies, whereas traditional market cap data is only relevant for equities.

If external climate data providers deliver off-the-shelf versions of carbon intensity metrics normalized by EVIC, the Sustainable Investing Research and Data team adopts those results without any additional changes or edits. However, if the vendors do not offer those capabilities, the IT and Sustainable Investing Research and Data team calculate the results by dividing volume-based GHG emissions data (sourced from those same vendors) by EVIC information (sourced from Refinitiv Worldscope).

The Sustainable Investing Research and Data and IT teams had in-depth discussions with various investment teams' research groups to agree on the rules and criteria for calculating those EVIC-normalized intensity results, as well as to craft and employ missing data treatments.

Case 1: Carbon emissions are available; EVIC is missing

- Fill EVIC with $median_{sub-industry} \left(\frac{EVIC}{Revenue} \right) * revenue$
- Revenue of missing company comes from Trucost table

Case 2: Carbon emissions are missing; EVIC is available

- Populate sub-industry medians for $\frac{Carbon Emissions}{EVIC}$
- Fill carbon intensity directly with $median_{sub-industry} \left(\frac{Carbon Emissions}{EVIC} \right)$

Case 3: Both carbon emissions and EVIC are missing

- Populate sub-industry medians for $\left(\frac{Carbon Emissions}{EVIC} \right)$
- Fill carbon intensity directly with $median_{sub-industry} \left(\frac{Carbon Emissions}{EVIC} \right)$

Point-in-Time Views

State Street Global Advisors has also addressed the lack of point-in-time (PIT) views for specific sustainability datasets. Without PIT views, vendors may backfill information or regenerate history to produce data.

Adjusting Data Frequency

In some cases, external vendors may provide data feed updates at a higher frequency than monthly. For example, several climate datasets are generated and shared on a weekly basis. However, those results remain mostly static from week to week. Furthermore, most internal systems (such as those using the data for investment purposes or client reporting) only require monthly updates. Consequently, Sustainable Investing Research and Data IT teams have created consolidated monthly views that display only one update per month (rather than one per week) for all vendors. These updates are displayed on a set day of the month, allowing downstream users access to more streamlined and relevant information, and avoiding clutter and noise in our view.

State Street Corporation has company-wide requirements for model risk management to which our models, including the R-Factor model, adhere. Independent model validation is a formally structured process intended to determine whether a model has been developed and implemented consistently with its design objectives and business uses and has an ongoing monitoring plan in place. Validation is performed in accordance with State Street corporate guidelines and determines if the model is approved for implementation. Model validation is conducted prior to model use and on a periodic basis with a frequency commensurate with the assessed risk and whenever model changes are made, in addition to annual model reviews.

The Sustainable Investing Research and Data team, in conjunction with the IT team, has built monthly data quality checks and reports that track historical correlation and coverage dimensions of thousands of individual sustainability metrics and scores over time.

The data quality checks occur for both model input and output metrics. The calculated statistics are stored in the production database and visualized using an interactive data visualization software. The software is intended to allow or is designed to allow internal users to identify any significant historical deltas for various indicators and datasets, any loss of coverage, or any other similar data issues.

These quality checks are mostly divided into two key areas: correlation and coverage:

- Correlation reports analyze how ratings or scores correlate with their historical values across time, to ensure there are no sudden or unexplained spikes or dips in ratings. Most of those significant deltas will be correct and driven by specific events, but the Sustainable Investing Research and Data team engages with the vendors to validate those results and to make sure no errors are plaguing the dataset.
- Coverage reports analyze how coverage for each metric and indicator has changed over time. In particular, this report evaluates various universes and lists of index constituents to make sure there is no sudden drop in coverage. Drops in coverage could be warranted (for example, the provider might be slowly discontinuing the use of a metric to replace it with a different indicator). Still, if any noticeable drop in coverage happens, the Sustainable Investing Research and Data team engages with the vendors to inquire about the reasoning behind those changes and to make sure the data being leveraged is correct and sound.

Additionally, each month, the Sustainable Investing Research and Data team calculates the number of issuers with significant standard deviation changes. These reports are essential in identifying any potential data issue, and reporting those issues (and their resolutions) to the Model Risk Management (MRM) team. Any breaches that break the boundaries or thresholds agreed on with the Model Risk Management (MRM) team are investigated by the firm's internal teams and reported to the external vendors' data teams. External vendors either confirm the results or provide correct data feeds to replace the erroneous files.

8 Systems and Downstream Delivery of Data

All applications and software, including client reporting systems, FactSet portfolio analysis reports, and portfolio management, risk, and compliance tools, receive information sourced from the sustainability data views in the firm's production database. All information is fed downstream to help ensure that all data and results are consistent throughout the firm.

IT personnel share ready-made extracts with the required data on a recurring, fixed basis (usually once a month, as soon as the periodic data is checked out) with team subgroups, including Portfolio Construction, Risk Client Reporting, Compliance, and other relevant internal teams, who upload that particular information to the necessary software or tool.

The organization has also prioritized the delivery, distribution, and use of standardized sustainability data, and has funded several sustainability data rationalization workstreams.

State Street Global Advisors is aware of the importance of leveraging reliable and trustworthy data for any investable purpose, from powering quantitative strategies, to displaying results in a client or regulatory report, to informing conversations with companies and clients. As a result, State Street Global Advisors has built robust processes and systems to help ensure that all sustainability data and information used by the firm is sound, validated, consistent, and standardized.

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* Pensions & Investments Research Center, as of December 31, 2023.

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