MORNINGSTAR | SUSTAINALYTICS

ESG Risk Ratings
Methodology: Version 3.1

July 2026

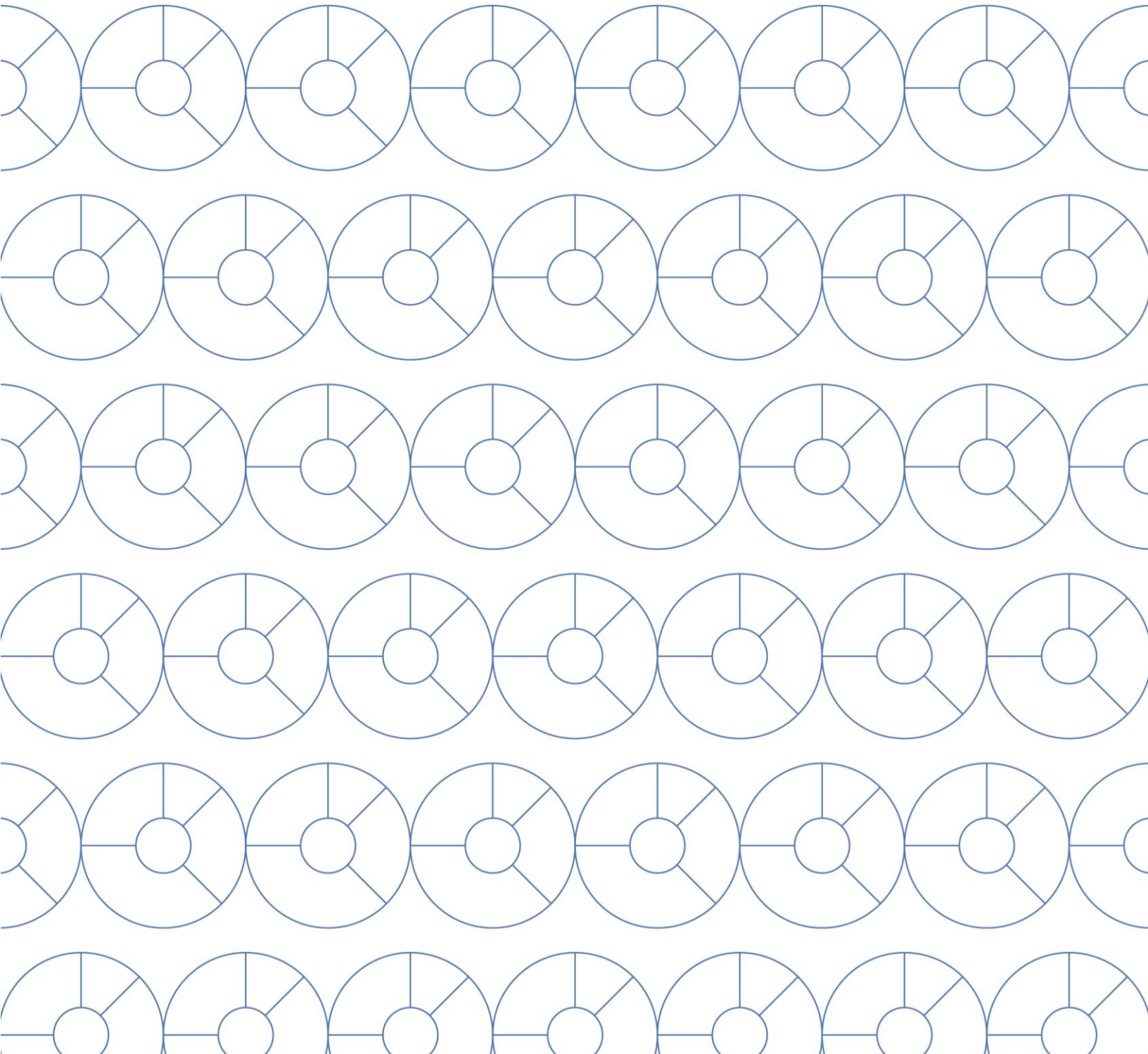

Table of Contents

Methodology Summary

July 2026

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Morningstar Sustainalytics' ESG Risk Ratings measure the degree to which a company's economic value (enterprise value) is at risk, due to ESG factors. The ESG Risk Ratings assess the magnitude of a company's unmanaged ESG risk. For each company, unmanaged risk is measured by evaluating a set of material ESG issues (MEIs) based on both the company's **Exposure**[1] to and **Management** of those issues. The resulting unmanaged risk measures for each issue are then summed up to provide one score that represents the company's overall ESG risk.

Highlights

Our ESG Risk Ratings empower investors by providing relevant insights into sustainability risks, specifically through the following key features:

- A focus on MEIs that present the most material risks to a company's economic value.
- MEIs are at the center of our rating, each one addressing a specific, ESG topic.
- Corporate Governance and Stakeholder Governance are fully integrated into the ESG Risk Ratings methodology.
- A two-dimensional lens approach, where the exposure lens informs investors which material ESG risks a company is facing; and the management lens assesses how well the company is managing material ESG risks.
- The exposure dimension incorporates factors such as a company's business model (including geographical aspects), financial strength, and risk event history.
- The management dimension provides a high level of granularity to a company's management strengths and weaknesses.
- In the management dimension, the discounting effect increases with risk event severity; more severe risk events have a higher impact on the ratings.
- The 'single-currency-of-risk' approach allows for comparability of companies across industries at both the overall ESG and issue-specific risk levels.
- External shocks are reflected in the ratings, increasing a company's risk depending on the materiality of the shock.
- ESG Risk Ratings are driven and determined by the underlying concept of forward-looking exposure; quantitative and qualitative factors linked to the exposure assessment are designed to capture trends and anticipate future developments.

Purpose

This methodology outlines the approach taken by Morningstar Sustainalytics to generate its **ESG Risk Ratings**. The methodology establishes how ESG risks are identified, measured and aggregated to produce standardized assessments of a company's ESG risks.

The ESG Risk Ratings measure the degree to which a company's economic value (enterprise value) is at risk due to ESG factors, more specifically, the magnitude of a company's unmanaged ESG risks. The ESG Risk Ratings are defined by two key dimensions: exposure and management. Material ESG Issues (MEIs) are assessed for each company based on these dimensions, and the resulting **Unmanaged Risk** values are aggregated into an ESG Risk Score and ESG Risk Category.

The outcomes of this methodology are designed to support several analytical objectives. Users can gauge ESG risk across sectors, industries or subindustries or evaluate risk within the same classification group. The methodology also enables thematic analysis, such as examining unmanaged risks related to Human Capital or Emissions, Effluents and waste across companies.

Together, these elements provide a consistent framework for evaluating ESG-related risks and for generating outputs that can be applied across a range of analytical and decision-making contexts.

Methodological Approach

A company's ESG Risk Rating is a risk category informed by a quantitative score. The quantitative score represents units of unmanaged risk, with higher scores representing more unmanaged risk. Based on their quantitative score, companies are grouped into one of five risk categories (negligible, low, medium, high, severe).

These risk categories are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all subindustries covered. This means that a bank, for example, can be directly compared with an oil company or any other type of company. One point of risk is one point of risk (equivalence principle), no matter which company or which issue it applies to, and points of risk add up across issues to create overall scores. With the ESG Risk Ratings' scores, we have introduced a 'single currency' for ESG risk.

Defining Materiality and Risk

An issue is considered material for the purposes of ESG Risk Ratings if its presence or absence in financial reporting is likely to influence decisions made by investors. To be considered relevant to the ESG Risk Ratings, an issue must have a potentially substantial impact on the economic value of a company and, hence, its financial risk and return profile from an investment perspective. It is important to distinguish the ESG Risk Ratings' use of materiality as a concept from narrower legal or accounting-focused definitions. Not every issue that we consider to be material for the purposes of the ESG Risk Ratings is legally required to be disclosed in company reporting.

Two Frameworks for One Rating

We apply a single ESG Risk Rating to each company, but this rating can be calculated using one of two methodological frameworks: the **Comprehensive Framework** or the **Core Framework**. Only one framework is applied to any given company. The choice between frameworks is based on a company's inclusion in designated market indexes. Companies included in these indexes are assessed using the Comprehensive Framework, while all others are assessed using the Core Framework.

The Comprehensive Framework is the foundational methodology of the ESG Risk Ratings. It includes the full set of management indicators, all methodological features and detailed issue level assessments.

The Core Framework uses a streamlined subset of the Comprehensive framework's indicators. Every indicator in the Core Framework is directly drawn from the Comprehensive Framework; however, not all Comprehensive indicators appear in the Core version. The Core Framework therefore serves as an approximation of the Comprehensive Framework, calibrated so that its outputs are comparable to those generated under the full methodology even though those outputs are based upon a reduced set of management indicators. The Core model is regularly calibrated to assure that there are comparable final rating outcomes regardless of the framework used.

The most substantive difference between the two frameworks is the treatment of Material ESG Issues (MEIs). While certain model parameters like the **Manageable Risk Factor**, **Risk Events Weight Shift**

and **Betas** are applied at the MEI level in the Comprehensive Framework, these elements have been slightly modified in the Core Framework so that they can be applied at the overall company level.

Beginning in Q3 2026, -companies will migrate to the Comprehensive framework, and the Core framework will be gradually retired once it is no longer used for any published data.

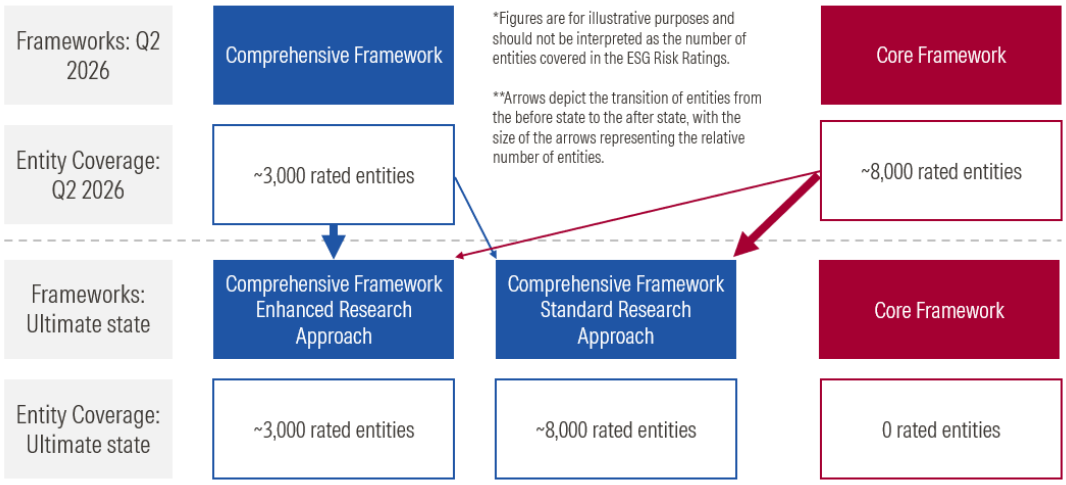
Note on Research Approaches

In addition to having two frameworks, there is also distinction made between two research approaches that are applied within the Comprehensive framework. The standard research approach is used for the majority of rated entities. An Enhanced Research approach involves additional, targeted review of key parameters. Additional details on the differences between these approaches can be found in the Research Approach section of this document.

Most rated entities transitioning from the Core framework to the Comprehensive framework will be assessed using the standard approach. Meanwhile, most rated entities that were assessed under Comprehensive Framework at the end of Q2 2026, will be assessed according to the Enhanced Research approach. However, research-approach assignment is ultimately determined by market-index criteria, and exceptions may occur.

Exhibit 1 represents a before and after view of how entities are expected to transition between frameworks and research approaches, starting in Q3 2026 and ending in the ultimate state which is expected by the end of 2027.

Exhibit 1 Transition of Entities Between Frameworks and Research Approaches



Source: Morningstar Sustainalytics

Scope and Limitations

Scope

ESG Risk Ratings methodology is Morningstar Sustainalytics' rating framework for measuring the extent to which enterprise value is at risk, driven by environmental, social and governance (ESG) factors.

The ESG Risk Ratings are based on a material ESG issues approach, rather than a strict distinction between environmental, social and governance dimensions. For each company, ESG risks are measured by evaluating a set of material ESG issues (MEIs) based on both the company's exposure to and management of those issues. MEIs do not always assess distinct environmental, social or governance issues but can encompass a combination of related topics.

This methodology is applicable to all entities within the Morningstar Sustainalytics ESG Risk Ratings[2] Product Universe that are deemed eligible for research and ratings. The Comprehensive Framework has predominantly been applied to large and mid-cap companies in developed markets and large-cap companies in emerging markets. However, Morningstar Sustainalytics is currently expanding the scope of the Comprehensive Framework to eventually include all eligible companies within the ESG Risk Ratings Product Universe. The Core Framework is mainly applied to small-cap companies in developed markets and mid-cap companies in emerging markets. This methodology document speaks to the Comprehensive Framework unless noted otherwise. For more information on the methodology related to the Core Framework, see the Methodology Description – Core Framework section.

To support consistent research and comparability, entities are classified into 135 subindustries according to the Morningstar Sustainalytics Subindustry Classification System. The classification system is issued by Morningstar Sustainalytics and is available on our corporate website.

Limitations

The ESG Risk Rating assessments include qualitative opinions. As a result, it is not possible to capture here a complete or definitive list of potential limitations and qualifications within the assessments. The following is a non-exhaustive list of limitations that should be considered when interpreting ESG Risk Rating results:

- **Dependence on Publicly Available Information:** ESG Risk Ratings assessments rely on information that is accessible in the public domain, which may not capture all relevant misconduct, especially in jurisdictions with weaker disclosure requirements or less press freedoms.
- **Qualitative Judgments and Subjectivity:** Assessments involve qualitative, holistic judgments (e.g., severity, company responsibility, management), which introduces subjectivity into ESG Risk Ratings assessments. While Morningstar Sustainalytics makes every effort to maintain structural consistency. Similar facts may be interpreted differently.
- **Company Responsibility Assessment Challenges:** Determining the degree of company responsibility for impact, especially in complex supply chains or joint ventures, is difficult

and may result in different assessments with respect to substantially similar facts, despite our effort to achieve structured consistency.

- **Management Assessment Limitations:** Evaluating company management responses (remediation, prevention) can be challenging when disclosure is limited, potentially resulting in more critical opinions about firms that do not publicly disclose their remedial actions.
- **Geographic bias:** Incidents that occur in jurisdictions with freer press may be identified more frequently than those in locations with more limited press coverage or press freedom.
- **Lag in Detecting Issues:** Assessments are reactive to publicly reported incidents. Failures may be identified only after significant harm has already occurred. Emerging risks (e.g., systemic supply chain abuse) may not be captured until they surface in the news.

All data used to determine a company's rating is collected according to detailed guidelines and rules designed to ensure consistency across companies, but some data inconsistency may be possible. To enhance data accuracy, Morningstar Sustainalytics invites rated companies to review the data used in their ratings in order to identify any factual errors or inconsistencies. Most data are updated on an annual cycle, with interim updates incorporated when new information becomes available.

Morningstar Sustainalytics has strict quality control processes to review data sourced both internally and externally. These processes are designed to catch potential errors before publication. However, no system is perfect, and there remains a risk that inaccuracies may go undetected and reach clients.

We use the most recent data available at the time of collection. Where companies do not publicly disclose information on a given topic, or where available data are outdated, indicators may be assigned fallback categories such as “no data” or “no evidence of a policy.” These categories typically carry low scores (e.g., 0 or 20) and may negatively affect overall ratings, even where companies may have relevant policies or programs that are not publicly disclosed.

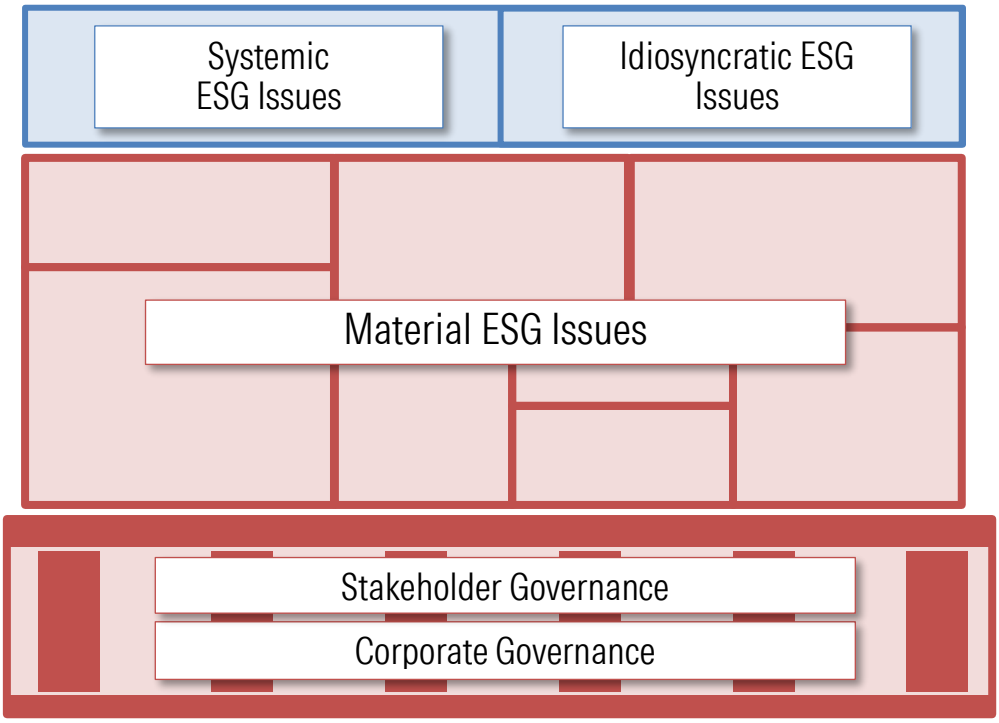
In limited cases, where data is missing, models, proxies or estimates may be used. These are designed to be robust and comparable at a portfolio or universe level but may not capture all company-specific nuances.

Methodology Description

ESG Risk Rating Building Blocks

The ESG Risk Ratings are built around three core building blocks that together determine a company's overall risk rating. As depicted in Exhibit 2, these building blocks are 1) **Material ESG Issues (MEIs)**, 2) **Baseline Issues**: Corporate Governance and Stakeholder Governance, and 3) **Systemic ESG Issues** and **Idiosyncratic ESG Issues**.

Exhibit 2 The building blocks of the ESG Risk Ratings



Source: Morningstar Sustainalytics

Building Block 1: Material ESG Issues

The primary building block of the ESG Risk Ratings is Material ESG Issues (MEIs). An ESG issue is material within the rating if it is believed that this issue could have a significant effect on the enterprise value of the company, and its presence or absence in financial reporting is likely to influence the decisions made by investors. A company's MEIs are determined by its business model and are pre-selected based on the risks regarded as material for its subindustry.

MEIs are focused on a topic, or set of related topics, that require a common set of management initiatives or a similar type of oversight. For example, employee recruitment, development, diversity, engagement, and labor relations are all employee-related and require human resources initiatives and oversight. The common thread across these issues is the business risks associated with the attraction and retention of qualified employees and are grouped under the Human Capital MEI. Occupational Health and Safety also concern employees, but the common thread here is to ensure the health and

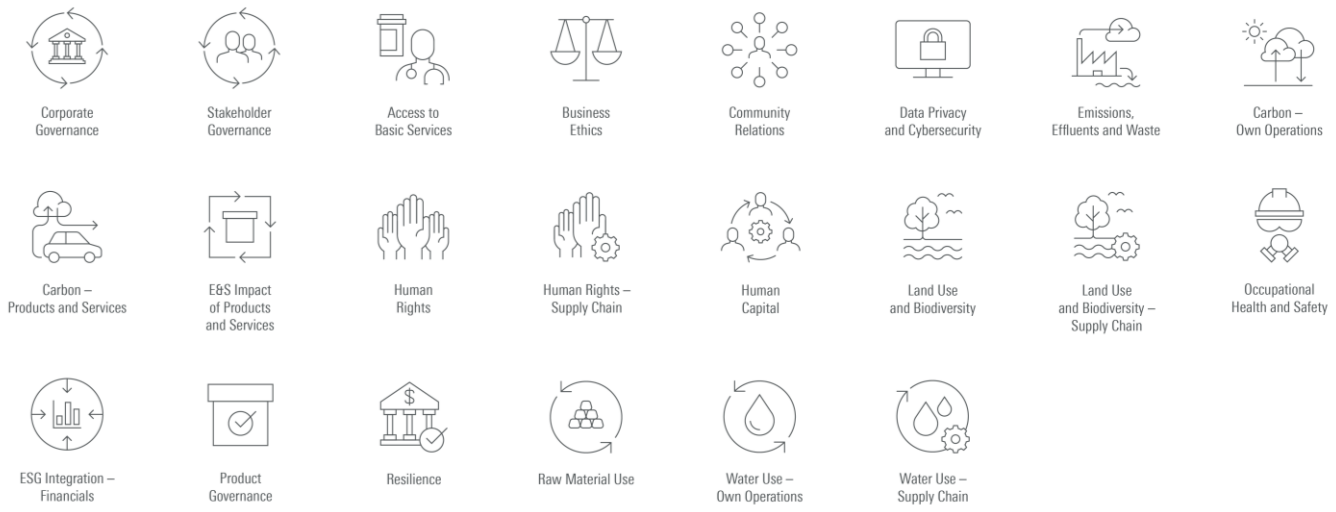
safety of employees in their workplace. Business risks associated with Occupational Health and Safety differ from those of Human Capital and are managed through a different set of activities.

MEIs do not always assess distinct environmental, social, or governance issues but can encompass a combination of related topics, depending on the specific issue. For use cases requiring a distinct analysis of environmental, social, and governance risks, please see the **E/S/G Cluster Scores** in the Methodology Context section.

Determining Material ESG Issues (MEIs)

The MEI selection is done at the subindustry level and is reviewed annually. For each subindustry, we determine a set of MEIs based on their materiality, together with a set of indicators used to assess the effectiveness of MEI management. Exhibit 3 lists the 22 MEIs that comprise the ESG Risk Ratings. In general, up to 10 MEIs are selected per subindustry, with a few exceptions. For a detailed description of all MEIs, please refer to the Appendix.

Exhibit 3 List of material ESG issues (MEIs)



Source: Morningstar Sustainalytics

We designed the MEIs to adhere to general structural principles, the most important of which is a clear separation between the stages of a company's value creation chain (supply chain, own operations, and products and services used by customers). For this reason, the ESG Risk Ratings comprise some related issues, as shown in Exhibit 4.

Exhibit 4 Pairs of Related MEIs – Differentiation Alongside the Value Creation Chain

MEI related to Own Operations	MEI related to Supply Chain or Products & Services
Carbon – Own Operations	Carbon – Products and Services
Human Rights	Human Rights – Supply Chain
Water Use – Supply Chain	Water Use – Supply Chain
Land Use and Biodiversity	Land Use and Biodiversity – Supply Chain

Source: Morningstar Sustainalytics

Issue Disabling at the Company Level

ESG issues that are considered material at the subindustry level can be removed from an individual company's assessment if they are considered not material based on that company's business model or its operating context. This type of adjustment is called **Issue Disabling**. One example is an issue that is linked to a business activity that is typical for companies classified in a subindustry but does not apply to the company at hand because the company does not engage in that specific activity.

Take, for example, the Semiconductor Design and Manufacturing subindustry, where the materiality of Water Use – Own Operations is driven by companies' use of large quantities of water during the manufacturing process. If a company fully outsources its manufacturing (e.g., a fabless company), the issue is no longer material, and we would disable that Water Use – Own Operations MEI from the company's assessment. Technically speaking, disabling cases like these are equivalent to setting a company's **Issue Beta** to zero (see Beta Assessments section below).

Issue disabling is typically employed as part of Morningstar Sustainalytics' Enhanced Research Approach. For more details about the Enhanced Research Approach, see page 50.

Building Block 2: Corporate Governance and Stakeholder Governance

The second set of building blocks of our ESG Risk Ratings are the Baseline Material ESG Issues Corporate Governance and Stakeholder Governance.

Corporate Governance refers to a system of rules and practices that help to ensure the interests of owners and managers are aligned and to promote transparency and accountability amongst management and shareholders.

Stakeholder Governance considers the perspectives and interests of various stakeholders to identify and mitigate potential reputational and financial risks. Both baseline issues are considered material, reflecting our conviction that poor governance poses material risks for companies. However, in contrast to other MEIs, these risks are not determined by a company's business model and, hence, their materiality assessment is not affected by a company's subindustry affiliation. Instead, the exposure and therefore relative importance of Corporate Governance and Stakeholder Governance is largely dependent on whether the company is traded publicly on exchanges or if it is privately owned.

For companies that are publicly traded, we assign higher materiality to governance issues due to their complicated management structures, greater degree of government oversight and control and high cost of operation compared to privately owned corporations.

The assessment process for the two baseline issues is closely aligned to our approach for MEIs. We evaluate both through a two-dimensional lens (exposure and management) to arrive at the final

assessment of unmanaged risk. Both dimensions also work in the same way as they do for material ESG issues. The management dimension uses management and risk event indicators (see the Risk Events Indicators section below) to assess a company's effectiveness in managing corporate or stakeholder governance issues in the same manner as MEIs. Like other MEIs, the exposure dimension uses a default exposure score that is adjusted at the company level. The main difference stems from the fact that private companies are deemed to have lower risk exposure to governance risks than publicly traded companies, as explained above, and that exposure differences are not driven by business models, but by ownership.

Building Block 3: Systemic ESG Issues and Idiosyncratic Issues

Systemic ESG Issues and idiosyncratic issues are unpredictable, or unexpected, in the sense that they are unrelated to the specific subindustry and the business model(s) that can be found in that subindustry. Both are built upon the events mechanisms but cover different concepts.

Systemic ESG Issues

A systemic ESG issue derives from a **Systemic Event**, which we define as a sea change event that is unpredictable in nature and affects large sets of companies at the same time and across a multitude of ESG issues. The degree to which companies are affected by the event, and therefore the event's materiality, is driven by a set of a few common factors reflected through our **Systemic Event Indicator (SEI)**.

Systemic events are not caused by any company action, and their management is (almost) completely out of a company's control. Therefore, SEIs do not include any consideration of company-specific responsibility for their occurrence or the appropriateness of any related corporate response (management). They provide a signal about the severity of the systemic event for a company with regard to its exposure to (systemic) ESG risks.

Notably, an issue only becomes a systemic (or an SEI) for a company if the associated event assessment passes a significance threshold, meaning that it has either high or severe risks. For more details on the application of the SEI, please see our Spotlight on Systemic Events in the ESG Risk Ratings[3].

A special characteristic of systemic events is their dynamic nature. Their evolution is extremely difficult, if not impossible, to predict. Typically, the situation evolves rapidly, and assessments need to be regularly monitored and adjusted. Over time, the uncertainty of the systemic event diminishes and eventually fades out. We then replace the generalized SEI assessment with our conventional (company-specific) events assessment and other indicators.

Idiosyncratic Issues

Idiosyncratic issues are derived from company-specific risk events that are atypical for the average company in its respective subindustry. For example, a carbon emissions scandal is atypical for many subindustries, such as Advertising and Publishing. It is certainly not predictable and falls outside of the logic with which we capture business model driven MEIs and often represents a failure of the company's management. If the associated risk event passes the significance threshold, with significant, high or severe risks, we capture the risk event in the ESG Risk Ratings with a pre-defined exposure score and a management score of 0. Notably, idiosyncratic issues become material issues only for the company in question, not for that company's entire subindustry.

For more details on Systemic Event Indicators and Idiosyncratic Issues, refer to the subsection The Exposure Dimension.

The Two Dimensions of the ESG Risk Ratings

The ESG Risk Ratings' approach to materiality is assessed through two dimensions: exposure and management. The first dimension, exposure, reflects the extent to which a company is exposed to material ESG risks at the overall and the individual MEI level. The second dimension, management, reflects how well a company is managing its exposure.

The Exposure Dimension

Exposure can be considered as a set of ESG-related factors that pose potential economic risks for companies. Another way to think of exposure is as a company's sensitivity or vulnerability to ESG risks. MEIs and their exposure scores are assessed at the subindustry level and then refined at the company level.

Exposure helps to determine the importance that we assign to MEIs. An issue with higher exposure will make a higher contribution to the overall risk exposure of a company and, conversely, an issue with a lower exposure will have a lower contribution to a company's overall risk exposure. In other words, issues that are financially more material to a company weigh more heavily in the balance of a company's rating, as we consider unmanaged risk of highly material issues to have a higher impact on enterprise value than unmanaged risk on less material issues.

Assessing Exposure for MEIs

The assessment of a company's exposure to MEIs is done in three steps:

- Step 1: Subindustry exposure assessment
- Step 2: Issue beta assessment
- Step 3: **Issue Exposure Score** calculation

The first step is to determine the default exposure of companies that operate in each subindustry (as characterized by roughly similar products and business models) vis-à-vis a set of potentially relevant ESG issues. Our approach to determining **Subindustry Exposure** is detailed in the Subindustry Exposure Assessment section below.

In the second step, we calculate a company-specific issue beta for each MEI active in a company's profile and apply it to the subindustry exposure score calculated in step 1. The issue beta reflects company-specific deviations from the subindustry default score and is assessed based on a pre-defined set of **Beta Indicators**, with an optional qualitative component that allows sector analysts to capture other company-specific exposure-relevant factors in the assessment. This step is executed by the analyst researching the company during the annual profile update process. As part of this step, the analyst can determine that an issue is not material for a given company and therefore disable the MEI from the company's assessment. This amounts to setting the issue beta to zero. Issue beta assessment and **MEI Disabling** are key features of the model, ensuring that the rating properly reflects the

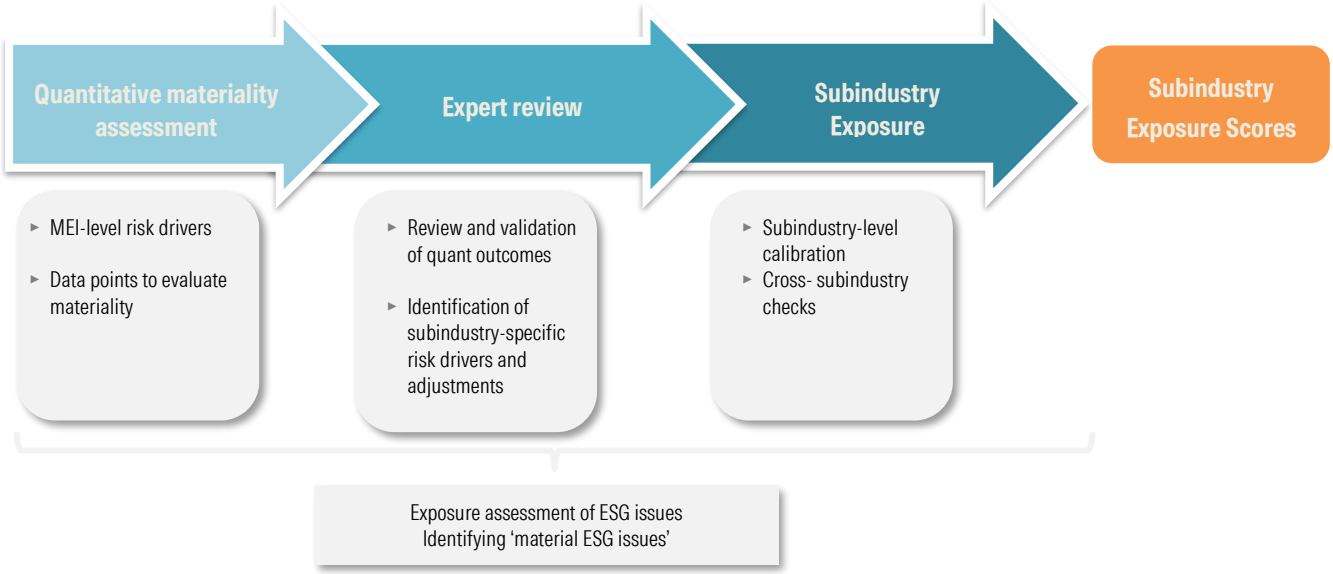
company's business model and the environment in which it operates. For more details on issue beta calculation, see the Beta Assessments section below.

Finally, the **Issue Exposure Score** is calculated by multiplying the default subindustry exposure score with the issue beta to arrive at the company exposure score vis-à-vis each MEI. The overall company exposure score is calculated by summing all the MEI-level company exposure scores.

Step 1: Subindustry Exposure Assessment

We assess subindustry exposure by first identifying the most relevant risk drivers based on an MEI's content, as well as associated data points that best allow us to evaluate the materiality of each risk driver at the subindustry level. Risk drivers are subindustry characteristics that contribute to risk exposure to a given MEI. We identify these drivers by assessing their materiality and, where relevant, reviewing available evidence, such as quantitative analyses linking risk drivers to company or industry outcomes. Examples of risk drivers are labor and skill intensity for Human Capital or data intensity and data sensitivity for Data Privacy and Cybersecurity. We consider a range of relevant data points to evaluate materiality, including companies' track records of risk events, structured internal and external data as well as third-party research. Examples of such data points are NOx and SOx emissions for the MEI Emissions, Effluents and Waste, or R&D expenditures for the MEI Product Governance. We combine individual risk driver assessments to produce an MEI-level quantitative materiality assessment, which forms the basis of our subindustry exposure score assessments, as illustrated by Exhibit 5.

Exhibit 5 Subindustry Exposure Score Assessment Process



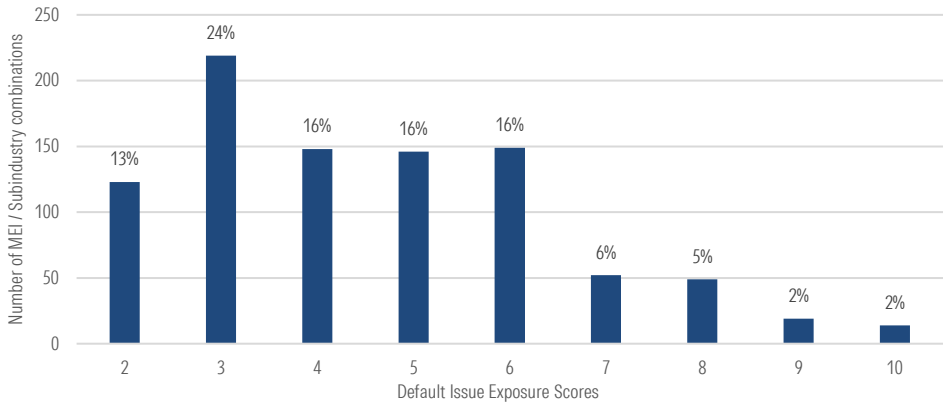
Source: Morningstar Sustainalytics

The outcome of this process is the **Subindustry Exposure Score**, which assesses the exposure of a typical company in the subindustry to an MEI. The score ranges from 2 to 10 for issues considered material, with 2 indicating a low level of exposure and 10 indicating a high level of exposure for a subindustry. ESG issues with a score of below 2 are considered immaterial.

Subindustry exposure scores are reviewed on an annual basis as a part of our ESG Risk Ratings review process (see Revisions section), which comprises a review of the model parameters. It consists of updating the quantitative analyses underpinning materiality assessments as well as sector expert review and consultation.

Exhibit 6 shows the distribution of subindustry exposure scores in the ESG Risk Ratings at the issue level, across all MEIs and subindustries.

Exhibit 6 Distribution of Subindustry Exposure Scores per MEI and Across all Subindustries



Source: Morningstar Sustainalytics. Data as of January 2026.

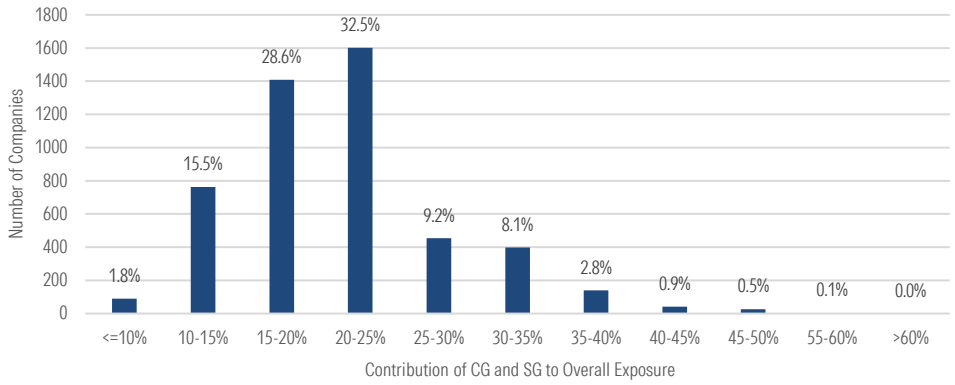
Exposure: Corporate Governance and Stakeholder Governance

As described above, with respect to the exposure dimension, Corporate Governance and Stakeholder Governance deviate slightly from the approach taken for MEIs. We assess both issues for all publicly traded companies covered in our Comprehensive Framework and they cannot be disabled. The exposure score across all subindustries is evaluated at 7 for Corporate Governance and 2 for Stakeholder Governance.

For privately owned companies, a typical Corporate Governance assessment is not suitable, as factors like ownership, shareholder rights, and financial reporting are either irrelevant or significantly less important. However, it is crucial for private companies to effectively manage their relationships with stakeholders. This emphasis is shown by excluding certain elements from the assessment, primarily due to insufficient reporting, and focusing on evaluating Stakeholder Governance. To reflect this, we increase the exposure score of private companies by using the beta indicator Ownership (see the Beta Assessments section below). This multiplier sets the exposure score of Stakeholder Governance from 2 to 5 for private companies (all else being equal).

Exhibit 7 below displays the contribution from Corporate Governance and Stakeholder Governance to the overall exposure score. For around one-third of the companies covered within the Comprehensive Framework, the exposure scores derived from the baseline issues contribute 20% to 25% of the overall exposure score. The distribution is driven by the differentiation of MEIs across business models and their distinct exposure assessments.

Exhibit 7 Contribution of Corporate Governance (CG) and Stakeholder Governance (SG) to Overall Exposure



Source: Morningstar Sustainalytics. Data as of July 2024.

Exposure: Systemic ESG Issues and Idiosyncratic Issues

Systemic ESG issues (SEI) materialize if the underlying SEI passes the threshold of Category 4 or 5. Systemic event categories are structured from a scale of 0 (no evidence of financially material incidents) to 5 (risks are severe), with Category 4 defined as having high risks. We assign an SEI to an event category based, typically, on a company's susceptibility to the event. A Category 4 event is associated with an exposure score of 6, whereas a Category 5 event is linked to an exposure score of 8.

For example, the SEI 'Business Resilience Risk Due to Ukraine Conflict' assesses the level of business resilience risk related to the Russia–Ukraine war that companies face and is based on the percentage of assets held in Ukraine. Companies with assets between 20% and 49.9% held in Ukraine are considered to be facing a Category 4 event, which translates into a default exposure score of 6, whereas those with over 50% of their assets in Ukraine are assessed as facing a Category 5 event, which corresponds to a default exposure score of 8.

Default exposure scores can be adjusted further by sector analysts through qualitative overlays. The spotlight on systemic events in ESG Risk Ratings provides an in-depth description of the systemic events methodology and how it has been applied in the context of the Russia-Ukraine war.

An **Idiosyncratic Issue** becomes a MEI and enters a company's rating equation if the risk event is assessed at Category 3, 4 or 5 and is not associated with the company's subindustry. In case of such a risk event, the (now) material issue receives a predetermined exposure score of 4, 6 or 8, respectively.

Bayer AG's ESG Risk Rating is an example of an idiosyncratic issue. The company is involved in a severe (Category 4) risk event related to the potential health hazards posed by glyphosate; a non-selective herbicide used in the company's Roundup product. The corresponding risk event, Social Impact of Products, is not considered material for pharmaceuticals companies in general. However, due to the severity of the controversy, the risk event indicator flows into Bayer's rating as an idiosyncratic issue, increasing its exposure score by 8 points.

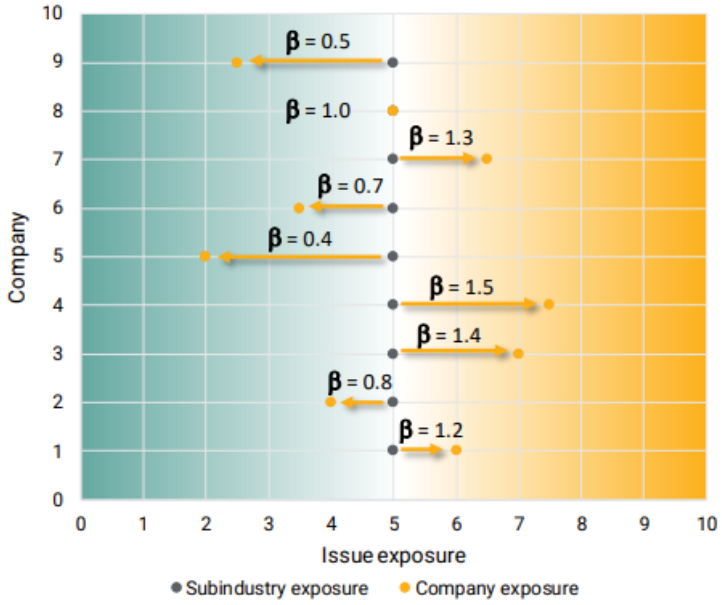
Step 2: Issue Beta Assessment

In mainstream finance, beta measures the risk of security relative to a market benchmark. The concept of beta has been figuratively applied in the ESG Risk Ratings, in which **Issue Betas** determine a company's exposure to an ESG issue relative to its subindustry's exposure to the same issue.

In our rating approach, exposure is defined against a set of ESG-related risk factors that pose potential financial risks to certain groups of companies. As described above, we determined exposure for MEIs at the subindustry level through a robust process that combines quantitative information with sector expert assessments. However, it is only with the use of betas that we can adjust subindustry exposure scores so that these more accurately reflect individual companies' levels of exposure. It is a way of sharpening or refining the ESG risk signal.

In scoring terms, this means that betas are used to reflect how a company's exposure score (either for an issue or overall) deviates from its default, or subindustry, exposure score. The subindustry exposure score is multiplied by the company's issue beta to derive the company's own issue exposure score, as shown in Exhibit 8.

Exhibit 8 Using the Beta Concept to Arrive at Company Specific Exposure Assessments



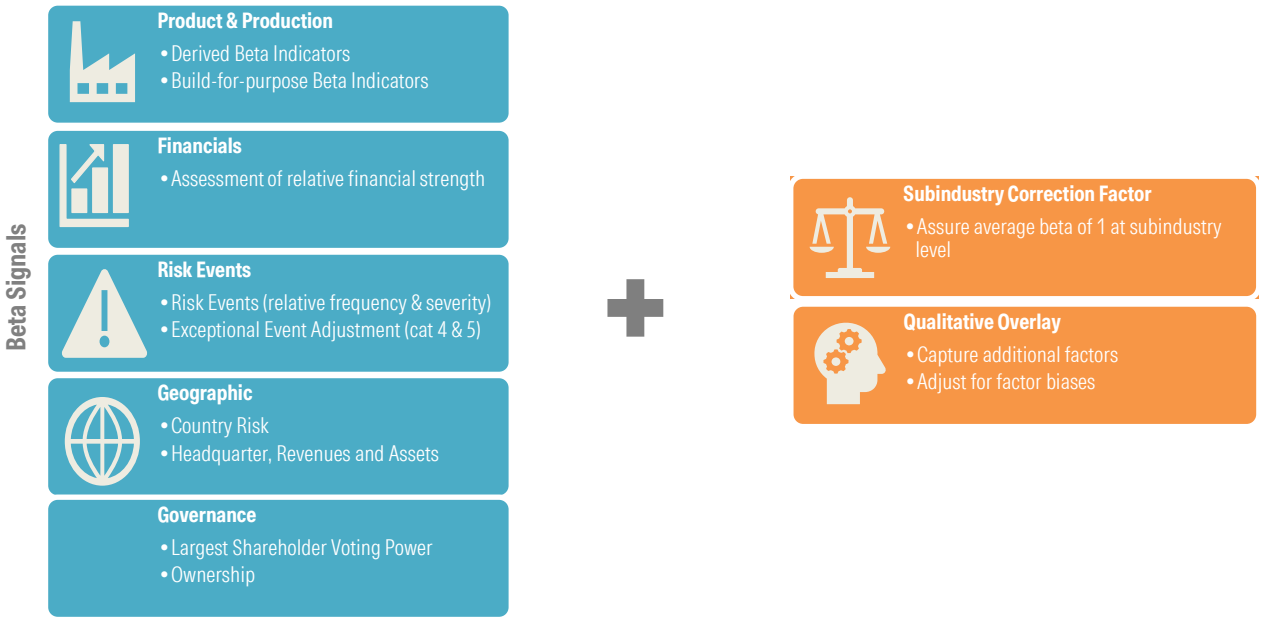
Source: Morningstar Sustainalytics.

In the ESG Risk Ratings, issue betas are measured on an open-ended scale that starts at zero and rarely goes beyond 2. A beta of zero means that the company is not exposed to an issue. Such an issue would disappear from this company's rating model, or in other words be disabled. A beta of 2 means doubling the subindustry exposure score, i.e. if the subindustry exposure score is 10, the company-specific exposure score would be 20. This would also double a company's unmanaged risk on the issue, all else being equal.

As shown in Exhibit 9, the beta for a company vis-à-vis a material ESG issue is calculated in a three-stage process. The starting point of our model is a list of subindustry and MEI specific **Beta Indicators**; assessing these indicators is the first step. The outcomes, **Beta Signals** are added to the subindustry default beta value of 1 together with the **Qualitative Overlay** and the **Subindustry Correction Factor (SCF)**. Refer to the sections below for more details on each of those elements.

Beta indicators have been created for five distinct thematic areas, also called **Beta Components**: Product & Production, Financials, Risk Events, Geographic and Governance. Each of these components can comprise multiple signals but also may not provide any signal at all. The exact specification of any given component depends on the MEI/subindustry combination.

Exhibit 9 Model for Calculating Issue Betas



Source: Morningstar Sustainalytics. Governance Components only applied to Corporate Governance or Stakeholder Governance, and Subindustry Correction Factor not applicable.

In the second step, we apply a technical correction factor to assure that the average beta within a subindustry is 1. Finally, a qualitative overlay may be applied by our analysts when updating a company profile to incorporate company specific factors that are not reflected in the standard model.

Beta Indicators, Beta Signals & Beta Components

Beta indicators provide a systematic and consistent assessment according to clearly delineated and standardized criteria. For each MEI, beta indicators have been selected to explain and measure how significantly a company is exposed to the respective MEI relative to its subindustry, excluding beta indicators of the Risk Events and Governance components, which are absolute and not compared to the subindustry. The selection or set of beta indicators is dependent on subindustry and MEI, which is technically represented in the **Beta Activation Matrix** with binary values {1, 0}. Beta indicators may be applied to any issue where they are considered relevant and may therefore appear across multiple MEIs.

All Beta Indicators follow a consistent structure and use predefined Outcome Categories, similar to **Management Indicators**. However, instead of directly assessing policies or performance, ESG Issue Beta Indicators translate existing data points into exposure signals. Beta Indicators may draw on inputs such as:

- ESG Management Indicators
- ESG metrics (reported or estimated)
- Product involvement or sustainable product metrics
- Financial metrics
- ESG Event Indicators
- Country Risk Ratings combined with geographic exposure data

Beta Assessment Definitions
Key terms used in the beta assessment and their definitions are as follows:

Beta indicator: Forms the lowest level of defined scoring within the exposure dimension of the ESG Risk Ratings. Beta indicators provide a systematic and consistent assessment of clearly delineated and standardized criteria at the individual company level. Beta indicators comprise a set of outcome categories, with the outcome of the assessment forming the beta signal. Additional information on the types of beta indicators and details on how they are operationalized can be found in the ESG Indicator Standards Overview document.

Beta signal: Provides the outcome (score) of the associated beta indicator that typically ranges between -1 and +1. The scoring algorithm applied to a beta indicator (and therefore the beta signal) can be issue and subindustry specific. Individual beta signals add up and, together with the qualitative overlay, subindustry correction factor, and the beta default value of 1, result in the final issue beta.

Beta component: Refers to the five main thematic areas that Morningstar Sustainalytics considers when adjusting a company's exposure to MEIs by using betas: Product & Production, Financials, Events, Geographic, and Governance. The sum of beta signals that belong to a beta component is called the component outcome (or score). Beta components provide another layer of analysis, but do not play any specific role in scoring.

Exceptional Event Adjustment

The so-called exceptional event adjustment is a special beta indicator that recognizes the exceptionality of Category 4 or 5 risk events and adjusts the scoring algorithm to reflect the additional order of magnitude in exposure that is implied by the occurrence of these risk events. The beta signal that we derive from this indicator differs from others, as it is calculated based on our notion of a 'single currency of ESG risk'. Within our model, one point of risk is one point of risk, no matter where and at what level it is generated.

In the context of the exceptional event adjustment, a company's exposure increases by points of risk that are linked to the frequency of Category 4 and 5 risk events. The mapping is shown in Exhibit 10.

Exhibit 10 Exceptional Event Adjustment – Mapping Table

Risk Event Category	Category 0 to 3	Category 4	Category 5
Exposure score MEI	Default score	+1 (min 6)	+2 (min 8)

Source: Morningstar Sustainalytics

The beta signal that is generated based on this mapping divides the points of risk by the **Subindustry Exposure Score**.

For example, let's use a subindustry exposure score of 4. The company to be assessed has a Category 4 risk event for this issue, which would equate to additional exposure of 1 point, and a minimum of 6 exposure points. Since the subindustry exposure score of 4 would only increase to 5 by adding one point of exposure, we need to increase the exposure further to meet the minimum of 6 points of exposure. The subindustry exposure score therefore needs to increase by 2 points to arrive at 6.

We calculate the exceptional event adjustments beta required by dividing the additional points of exposure of 2 by the subindustry exposure score of 4, yielding a beta indicator signal of 0.5.

Qualitative Overlays

As part of the annual company profile update, analysts assess company-level exposure vis-a-vis each MEI and have the option to apply a qualitative overlay, which is added to all the other beta components to arrive at the final issue beta. Potential reasons for qualitative overlays include (1) situations in which company-specific factors are not reflected in the beta signals coming from beta indicators, or (2) situations in which the beta signals, either individually or collectively, do not yet reflect recent developments (e.g., M&A activity). Overlays can be applied at the MEI level only, not at the overall level. The application of qualitative overlays is guided by methodological principles and processes that ensure the overlays are appropriate and applied consistently for similar cases. Each qualitative overlay carries a rationale explaining the reasons behind it. Although qualitative overlays may be applied to all companies in the Comprehensive Framework, they are most frequently used for companies that follow the Enhanced Research Approach (see page 50).

Subindustry Correction Factor

The Subindustry Correction Factor (SCF) is a methodological element used to align each average beta value within a subindustry at a theoretical beta value of 1. The SCF was historically calculated for each MEI within each subindustry and applied automatically within the model framework.
Beginning in April 2026, the ongoing calculation of the SCF is discontinued and all profiles published after this date will have the SCF set to 0 for all MEIs. The SCF field remains in place for historical tracking, but when all values are eventually published as 0, it will no longer influence outcomes of the ESG Risk Ratings.

Corporate Governance & Stakeholder Governance

Corporate Governance and Stakeholder Governance deviate from the explained approach due to them not being subindustry dependent. Instead, we use the absolute elements, specifically event-based betas and the governance components as well as the qualitative overlay.

As part of the governance components, beta indicator **Ownership** plays a key role and is always activated for Stakeholder Governance. It differentiates between privately and publicly traded companies by increasing the exposure score for private companies. Given that Corporate Governance is not assessed for private companies, this entails a relatively higher weight for Stakeholder Governance. For private companies, the beta indicator adds a beta signal of 1.5 to a baseline of 1. Ceteris paribus, the resulting Stakeholder Governance Issue Beta of 2.5 increases the Stakeholder Governance exposure from 2 to 5. For publicly traded companies, the beta signal is set to 0 and therefore does not affect the exposure score.

Systemic ESG Issues and Idiosyncratic Issues

Exposure scores of systemic ESG issues and idiosyncratic issues can still be adjusted by the analyst through an issue beta. However, there is no signal-based issue beta for idiosyncratic risk events, and the only beta markup would come from the qualitative overlay in this case.

Step 3: Issue Exposure Score Calculation

As shown in Exhibit 14 below, beta signals, the qualitative overlay, and the subindustry correction factor add up to form the final markup that is added to the theoretical average beta of 1, which then forms the final issue beta for a given company. Beta signals are also aggregated with their beta components (reflecting the respective thematic areas). Beta components are used as additional levels of information aggregation. They do not serve any particular purpose in the calculation of the issue beta. Exhibit 11 illustrates a full beta calculation.

Exhibit 11 Issue Exposure Score calculation for the MEI Carbon – Products & Services in the Automobiles Subindustry – Example

Beta Indicator	Beta signal	Beta component	Beta component signal
Fleet Emissions	+0.15	Product & Production	+0.15
Operating Performance	+0.03	Financials	+0.04
Solvency	-0.03		
Financial Flexibility	+0.02		
Asset Performance	+0.02		
Environmental Impact of Products Risk	+0.03	Risk Events	+0.06
Carbon Impact of products Risk	+0.03		
Exceptional Event Adjustment	±0.00		
Headquarter Location	±0.00	Geographic	+0.01
Sales Location	+0.01		
Sum of Beta Signals	**+0.26**		**+0.26**
Qualitative Overlay	-0.05		
Subindustry Correction Factor	+0.01		
Baseline	+1.00		
Issue Beta	**+1.20**		

Source: Morningstar Sustainalytics. Notes: Increments of 001 at the beta signal, qualitative overlay subindustry correction factor level, issue beta signal rounded to the nearest 0.05 increment. Beta component signal = sum of beta signals for each component. Subindustry default value.

Notably, adjustments can be positive or negative (individually as well as in aggregate), signaling that a company's exposure to an issue is either below or above the subindustry average. Beta signals are not weighted; they are simply summed up.

Once the final beta calculation is done, everything is in place to determine a company's exposure to a MEI, which provides one of the two dimensions of our ESG Risk Ratings. The exposure scores on material Issue level and overall level are also the basis for the high-level descriptive exposure categories as shown Exhibit 12 and 13.

Exhibit 12 Exposure Categories at Issue Level

Category	Issue Exposure Score	Description
Low	0 to 3.99	The company's exposure to this material ESG issue is low.
Medium	4 to 7.99	The company's exposure to this material ESG issue is medium.
High	8 or above	The company's exposure to this material ESG issue is high.

Source: Morningstar Sustainalytics.

Exhibit 13 Exposure Categories at Overall Level

Category	Overall Exposure Score	Description
Low	0 to 34.99	The company's overall exposure to ESG risks is low.
Medium	35 to 54.99	The company's overall exposure to ESG risks is medium.
High	55 or above	The company's overall exposure to ESG risks is high.

Source: Morningstar Sustainalytics.

Before addressing the second dimension –management – we describe an intermediary step: the definition and application of the manageable risk factor.

Distinguishing Between Manageable and Unmanageable Risks

To achieve more realistic rating outcomes and to ensure comparability of ratings across subindustries, we distinguish between two types of risk within the ESG Risk Ratings: manageable and **Unmanageable Risks**. Unmanageable risks are those risks that are outside the boundaries of a company management's control, based on the assumption that the company continues its inherent business, i.e., it does not fundamentally change what it is doing.

To better understand the manageability of risk, we provide some illustrative examples, which refer to the following five drivers that we consider systematic:

- Inherent product characteristics
- Technological boundaries and innovation
- Human error
- Outside actors
- System complexities

Manageability of Risk – Examples

Take the example of an oil and gas company. The core products it produces; crude oil, natural gas, and refined fuels; almost always result in significant GHG emissions when used. While some portion of production can be directed toward non-combustion uses such as petrochemicals and plastics, the majority of this industry's output is typically destined for combustion. As a result, a substantial share of the company's exposure to the Carbon – Products & Services MEI is inherently unmanageable. Even with emerging mitigation options such as carbon capture and storage, only a limited portion of these downstream emissions can realistically be reduced with today's technologies.

Another example is airlines. One of their most material ESG issues is the GHG emissions of their fleet, which is covered in our rating under the Carbon – Own Operations MEI. In this case, the boundaries of manageability are set by technological constraints. Based on today's technology, an airline company cannot fully avoid the use of fossil fuels and, hence, some of these risks are considered unmanageable.

The notion of unmanageable risk is based on the world of today and of the foreseeable future. At some point in the future, technology may provide solutions to issues that are currently considered unmanageable. For example, at some point in time, it is conceivable that emission-free flights may be possible. Hence, our assessments of manageability can change over time. But they are expected to do so to varying degrees. Relative to technological innovation, for example, other drivers of manageability, such as human error and misconduct, are inherently more stable.

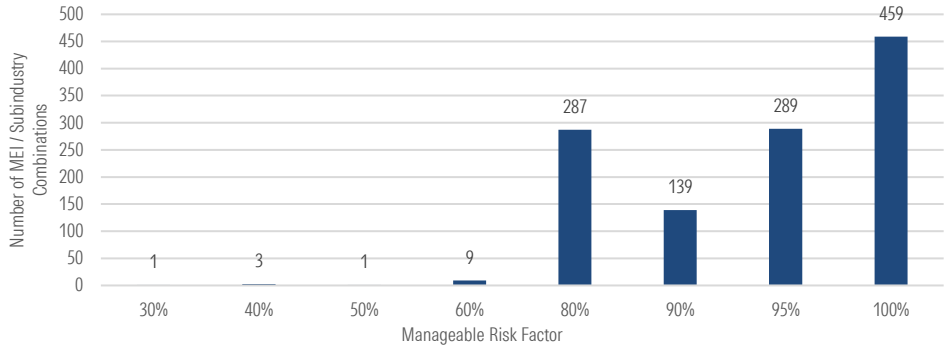
As long as people work in factories, for example, a company may have perfect health and safety policies and programs, but it will never be able to fully avoid the occurrence of accidents. The impact of human error, however, can be expected to shrink, driven by increasing digitalization. New sources of 'unmanageability' may arise instead. One example would be cybersecurity. Outside actors strive to illegally gain access to confidential information or sabotage a company's systems. Much can be done to manage these risks but, to some degree, criminal minds driven impacts remain unavoidable.

The Manageable Risk Factor

The share of risk that is manageable vs. the share of risk that is unmanageable is determined at the subindustry/MEI level by an **Issue Manageable Risk Factor (MRF)**. MRFs range from 30% to 100% and represent the share of exposure to an MEI that is deemed to be (at least theoretically) manageable by the company: the **Issue Manageable Risk**. Every MRF score that we publish is accompanied by analyst commentary that provides the rationale behind the score. MRFs are updated regularly as a part of our annual ESG Risk Ratings review. They are generated based on a structured and coordinated consultation process with our research teams.

Exhibit 14 shows how MRFs are currently distributed. The highest degree of unmanageability is for Tobacco (e.g., E&S Impact of Products and Service), where we consider only 30% of the exposure to this issue as being managed by companies. This is followed by Coal and Diversified Metals & Mining for Carbon – Products & Services, and Airlines for Carbon – Own Operations (all three of them with MRFs of 40%). In addition, Beer, Wine and Spirits only has 50% MRF for E&S Impact of Products and Service.

Exhibit 14 Distribution of Manageable Risk Factors per Subindustry and MEI



Source: Morningstar Sustainalytics. As of January 2026.

Corporate Governance and Stakeholder Governance

Corporate Governance and Stakeholder Governance are treated the same way as MEIs. They are set up with an MRF of 1 in mind, signaling that the company is theoretically able to manage 100% of its exposure related to these issues.

Systemic ESG Issues and Idiosyncratic Issues

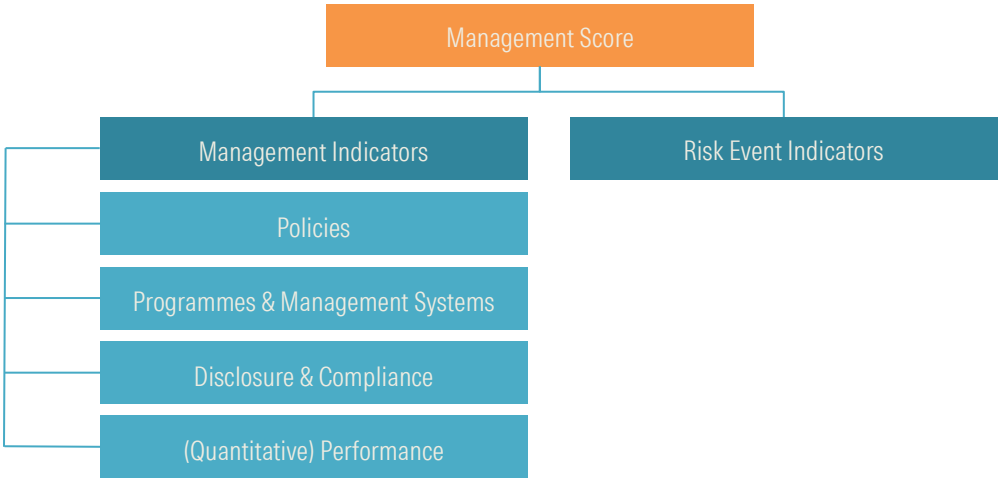
A systemic ESG issue is not driven by any company action, and its management is (almost) completely out of a company's control. It does not indicate mismanagement and therefore it is considered to have an MRF of 0. The MRF for an idiosyncratic issue is set to 1 as the underlying risk event represents a failure in the company's management.

The Management Dimension

ESG Risk Ratings' second dimension is management. It can be considered as a set of commitments, actions and outcomes that demonstrate how well a company is managing the ESG risks to which it is exposed.

As shown in Exhibit 15, a company's **Issue Management** and therefore also its **Overall Management** is derived from a set of management indicators (policies, management systems, certifications, etc.) and outcome-focused indicators. Outcome-focused indicators measure management performance either directly in quantitative terms (e.g. CO^2 emissions or CO^2 intensity), or via a company's involvement in controversies (represented by the company's risk event indicators).

Exhibit 15 Types of Indicators that Feed the Management Score



Source: Morningstar Sustainalytics

The management scores at the material issue level and overall level are also translated into descriptive high-level categories, as shown in Exhibit 16 and Exhibit 17.

Exhibit 16 Management Categories at Issue Level

Category	Issue Management	Description
Weak	0 to 24.99	The company's management of this material ESG issue is weak.
Average	25 to 49.99	The company's management of this material ESG issue is average.
Strong	50 or above	The company's management of this material ESG issue is strong.

Source: Morningstar Sustainalytics.

Exhibit 17 Management Categories at Overall Level

Category	Overall Management	Description
Weak	0 to 24.99	The company's overall management of ESG risks is weak.
Average	25 to 49.99	The company's overall management of ESG risks is average.
Strong	50 or above	The company's overall management of ESG risks is strong.

Source: Morningstar Sustainalytics.

For each material ESG issue/subindustry combination, management and risk event indicators are selected and weighed up to explain and measure how well a company manages an issue. These selections on expert assessments and, wherever relevant, industry standards, recognized best practices, and global reporting frameworks. Management indicators and risk event indicators may be applied to any issue where they are considered relevant and may therefore show up in the context of several material ESG issues, as follows.

Management Indicators provide a signal about how effectively a company is managing (a part of) its exposure to a material ESG issue through policies, programs, disclosure & compliance, or quantitative performance. Each management indicator has a set of outcome categories which correspond to a

numerical score. The score ranges between 0 (indicating no management) and 100 (indicating the best management).

Risk Event Indicators signal potential failures of a company's management, as reflected by its involvement in Risk Events. These indicators have a dilutive effect on a company's management score for the relevant MEI. The dilution mechanism works as follows: all risk event indicators have a default **Raw Score** and weight of 0. When the company is involved in a material risk event, the indicator's raw score remains at 0, but its weight is increased, thereby diluting the overall management score. The weight of the risk event indicator increases with both the severity and frequency of events, up to a threshold of 90%.

If a risk event indicator relates to an MEI that was not previously selected as material for a company, the issue becomes material if there is a Category 3, 4 or 5 risk event (see idiosyncratic issues). In the case of a Systemic Event Indicator (SEI), the issue becomes material and is treated as a systemic ESG Issue when a Category 4 or 5 systemic event occurs.

Below we provide a detailed description of management indicators and risk event indicators.

Management Indicators

Management indicators are used to measure a company's performance in managing its MEIs, including Corporate Governance and Stakeholder Governance. They provide a systematic and consistent assessment based on clearly delineated and standardized criteria. Management indicators are scored on a scale between 0 and 100. Additional information on the classes of management indicators, as well as how they are operationalized are detailed in the Sustainalytics ESG Indicator Standards Overview document.

Disabling Management Indicators

Management indicators are activated at the subindustry level for each material ESG issue. The weighting depends on the importance of the indicator for managing the issue and the specific subindustry. Some indicators might not be relevant for all companies in the subindustry as they differentiate themselves through business models or only participate in specific parts of the value chain with which the subindustry is associated. Analysts are able to account for such company specifics in the rating through **Management Indicator Disabling**. Once disabled, the indicator weight is set to zero for the company and it can only be assigned a positive weight if the indicator is re-enabled.

Take for example the management indicator Tailings Certifications, which assesses the percentage of a company's tailings storage facilities that have been externally certified according to reputable international standards. The indicator is activated for companies in the mining subindustries, such as Diversified Metals Mining or Gold. This indicator only provides a meaningful signal regarding a company's management if that company is actively engaged in ore extraction and processing, which is the source of mineral waste or tailings. Early-stage mining companies that are still in the exploration or mine development phases do not yet engage in such activities. In such cases, the indicator would be deemed not applicable and would be disabled by the sector analyst responsible for assessing the company.

The weight of the disabled indicator is distributed proportionally among the other active indicators for the subindustry/MEI combination, with stronger weighted indicators receiving more of its weight. Management indicator disabling is typically employed as part of Morningstar Sustainalytics' Enhanced Research Approach. For more details about the Enhanced Research Approach, see page 50.

Risk Event Indicators

In addition to Management Indicators, ESG management in the rating is assessed with the use of Risk Event Indicators. These indicators assign a risk event category for 41 different thematic areas, based on the evaluation of the underlying **Incidents** from a financial risk perspective. Each financially material Incident is mapped to the relevant risk event indicator according to its thematic alignment. The assessment of events considers the business risk that an event might pose to a company, aggregating this risk into financially material amounts from five risk components: operational, financial, legal, regulatory & compliance, and reputational.

This assessment also incorporates the financial health of the company affected by the incident. The final output for each risk event indicator is expressed as one of six Risk Event Categories. See the ESG Indicator Standards Overview for more details on the Risk Event Indicators and their operational considerations.

Risk Event Indicators and the Risk Ratings

Risk event indicators are assigned to material ESG issues based on their thematic relevance. Each individual MEI can be supported by multiple risk event indicators. In exceptional cases, a risk event indicator can even be active for several MEIs in the same subindustry.

Within the ESG Risk Ratings, risk event assessments enter the management score calculation via a dilution mechanism called the **risk events weight shift**, which is shown below in Exhibit 18.

Exhibit 18 Risk Events Weight Shift

Risk Event Category	Category 0	Category 1	Category 2	Category 3	Category 4	Category 5
Risk Event indicator raw score	0	0	0	0	0	0
Risk Event indicator weight shift	0%	0%	0%	25%	50%	75%

Source: Morningstar Sustainalytics.
Note: More than one risk event: addition of weight shift according to risk events category up to 90%.

Together with management indicator scores, risk event scores get rolled up in a weighted manner to form the overall management score for a given MEI. This is accomplished by assigning a raw score of 0 to each risk event (independent of its category) and combining it with a weight that depends on the risk event category. The weight of the risk event in the scoring algorithm increases as the severity increases, acting as a discount to the other management indicators, with a cap of 90% on the issue level. In this way, we are able to distinguish severe management failures from less financially material ones. High and Severe risk events also trigger increases to issue exposure scores (see the Exceptional Event Adjustment section).

Calculating the ESG Risk Ratings

Combining Exposure and Management

The fundamental aim of our ESG Risk Ratings is to provide investors with a signal that reflects the degree to which their investments (single assets or portfolios) are exposed to unmanaged ESG risks. To this end, the final rating outcome is designed as a measure of **Unmanaged Risk**, in which the two dimensions of the rating, exposure and management, are placed side by side and compared at both the issue level and the overall level. Based on the unmanaged risk scores, companies are assigned to one of five categories of ESG risk. The **ESG Risk Categories at Issue Level** are described in Exhibit 19, and the **ESG Risk Categories at Overall Level** and their respective globes are described in Exhibit 20.

Exhibit 19 ESG Risk Categories at Issue Level

Risk Category	Issue Unmanaged Risk	Description	Risk Category
Negligible	0 to 1.99	This material ESG Issue is considered to drive negligible risk to enterprise value.	Negligible
Low	2 to 3.99	This material ESG Issue is considered to drive low risk to enterprise value.	Low
Medium	4 to 5.99	This material ESG Issue is considered to drive medium risk to enterprise value.	Medium
High	6 to 7.99	This material ESG Issue is considered to drive high risk to enterprise value.	High
Severe	8 or above	This material ESG Issue is considered to drive severe risk to enterprise value.	Severe

Source: Morningstar Sustainalytics

Exhibit 20 ESG Risk Categories at Overall Level

Risk Category	Overall Unmanaged Risk	ESG Globes Rating	Description	Risk Category
Negligible	0 to 9.99	5 Globes	ESG factors are considered to drive negligible risk to enterprise value.	Negligible
Low	10 to 19.99	4 Globes	ESG factors are considered to drive low risk to enterprise value.	Low
Medium	20 to 29.99	3 Globes	ESG factors are considered to drive medium risk to enterprise value.	Medium
High	30 to 39.99	2 Globes	ESG factors are considered to drive high risk to enterprise value.	High
Severe	40 or above	1 Globe	ESG factors are considered to drive severe risk to enterprise value.	Severe

Source: Morningstar Sustainalytics

General Principle of ESG Risk Ratings Scoring

The five categories of risk in our rating are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all covered subindustries. This means that a bank, for example, can be directly compared with an oil company or any other type of company. Following the principle of equivalence, one point of risk is one point of risk, regardless of which company or which issue it applies to. Additionally, points of risk add up across issues to create overall scores. With the ESG Risk Ratings scores, we have introduced a 'single currency' for ESG risk.

The fundamental concept of points of risk allowed us to give the ESG Risk Ratings a fully modular structure. Issue-level exposure scores can be aggregated to arrive at an **Overall Exposure Score**, for example, or to arrive at scores for combinations of issues that might be of interest to investors from a thematic perspective (e.g., carbon risk).

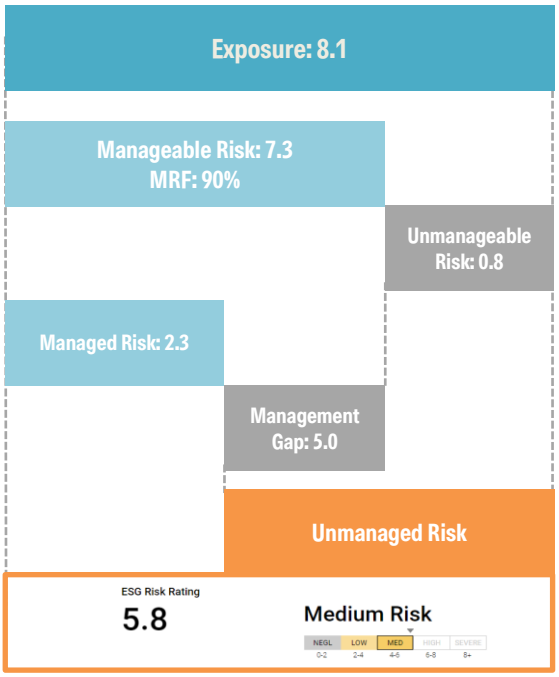
Risk Decomposition and Scoring Structure

The final ESG Risk Ratings scores are a measure of unmanaged risk, which is defined as the portion of material ESG risk that is not (yet) managed by a company. The ESG Risk Ratings scoring system for a company is best thought of as a waterfall with four levels. We start with the single-issue level and later aggregate to the overall level. Exhibit 21 explains the calculation of **Issue Unmanaged Risk** for a single material ESG issue.

Exhibit 21 Risk Decomposition – Example at Issue Level

Company: ABC Inc.

MEI: Community Relations *(Community Relations focuses on how companies engage with local communities (including indigenous peoples) through both positive initiatives and mitigation of negative impacts.)*



Company Exposure	=	Subindustry Exposure	*	Issue Beta		
	=	6	*	1.35	=	**8.1**
Manageable Risk	=	Company Exposure	*	MRF		
	=	8.1	*	90%	=	**7.3**
Unmanageable Risk	=	8.1	-	7.3	=	**0.8**
Managed Risk	=	Manageable Risk	*	Management score (as%)		
	=	7.3	*	31.9%	=	**2.3**
Management Gap	=	7.3	-	2.3	=	**5.0**
Unmanaged Risk	=	Company Exposure	-	Managed Risk		
	=	8.1	-	2.3	=	**5.8**

Source: Morningstar Sustainalytics.

The starting point at the top is a company's exposure to that issue, calculated as the product of the company's subindustry exposure and its issue beta.

At the second level, **Issue Manageable Risk (Manageable Risk)** is separated from **Issue Unmanageable Risk (Unmanageable Risk)** with the help of the manageable risk factor. In the example above, 90% of the risk associated with the ESG issue at hand is considered manageable. Multiplied with exposure, this gives us the manageable risk for this company's issue.

At the third level, the **Issue Managed Risk** (managed risk) is derived from the **Issue Manageable Risk (Manageable Risk)** by multiplying the latter with the **Issue Management (Management Score)**—interpreted as a percentage number—that is based on a set of management and risk event indicator outcomes. The part of manageable risk that is not managed is called **Issue Management Gap (Management Gap)** and is calculated by subtracting managed risk from manageable risk.

At the fourth level, **Issue Unmanaged Risk (Unmanaged Risk)** is calculated by either subtracting managed risk from exposure or by adding the management gap to the portion of risk that has been deemed unmanageable. In the example above, 5.8 points of risk out of a total of 8.1 remained unmanaged.

Arriving at the ESG Risk Ratings

The waterfall logic described in Exhibit 21 is also applicable to the overall level of the rating: overall scores can easily be derived in the same manner.

In addition, the modular structure provides a direct link between the issue level assessments and the company's overall rating. The aggregation from issue level to the overall level functions as follows.

The **Overall Subindustry Exposure Score** is determined by aggregating the material issue exposure scores. The company's overall exposure score is calculated by summing up its individual issue exposure scores. To compute the overall beta, the company's **Overall Exposure Score** is divided by the overall subindustry exposure score.

The **Overall Manageable Risk** is obtained by aggregating the issue of manageable risks. The **Overall Manageable Risk Factor** is calculated by dividing the overall manageable risk score by the overall exposure score. This factor expresses the percentage of ESG risk that the company has the capacity to manage effectively. To obtain the **Overall Unmanageable Risk**, the company's unmanageable risk scores are summed up.

For the **Overall Management** (the company's handling of ESG risks across issues), the issue management scores are weighted, using the **Issue Management Weight**, and summed up. The issue management weight is computed by dividing the issue manageable risk score by the overall manageable risk of the company. Summing up the company's issue managed risk scores determines the **Overall Managed Risk**. The **Overall Management Gap** is calculated by summing all issue management gaps.

Finally, to derive the company's ESG Risk Rating, all issue unmanaged risk scores are summed to arrive at the **Overall Unmanaged Risk**.

Methodology Description: The Core Framework

Two Frameworks: One Rating

The **Core ESG Risk Rating** is applied to entities that are in the coverage universe but are not covered by the **Comprehensive ESG Risk Rating Framework**. The most important difference between the two frameworks is that the Core Framework does not break down a company's ESG risk to the level of material ESG issues. Instead, it provides an overall risk score that is based on a reduced set of management indicators (which are a subset of the indicators in the Comprehensive Framework) and an optimization algorithm that assures alignment and comparability with the overall risk scores of companies in the Comprehensive Framework. This approach requires some adjustments to the rating's architecture. As the manageable risk factor, risk events weight shift and betas are all applied at the material ESG issue level in the Comprehensive Framework, these elements have been modified slightly so that they can be applied at the overall level for companies in the Core Framework.

The result is a top-down approach that keeps the waterfall logic with the **Risk Decomposition** untouched but is applied to the overall level only (different from the example provided).

The Exposure Dimension

The definition of exposure is identical in both frameworks: exposure is a set of ESG-related risk factors that pose financial risks for companies. However, as stated above, the Core Framework does not include issue-level assessments of exposure, rather it leverages these issues to assess risks at the subindustry level. The following two-step approach is applied to arrive at a company's overall exposure score.

The starting point for calculating a company's overall exposure score are the issue-level exposure scores for the subindustry in which the company operates. In the first step, the exposure scores of the issues are summed up, followed by considering specific cases, for example frequent disabling of issues in subindustries in the Comprehensive Framework.

In the second step, this score is adjusted by an **Overall Beta** to reflect company-specific deviations from the subindustry norm. Similarly to the Comprehensive Framework, beta indicators are leveraged to distinguish companies on the exposure dimension, but on the subindustry level instead of the issue level.

Beta Assessment

As in the Comprehensive Framework, the beta assessment is a key part of ensuring that the Core Framework accurately measures ESG risks specific to each company. Betas determine a company's exposure to ESG risk relative to its subindustry's exposure.

Structurally, like the Comprehensive Framework, in the Core Framework the markup to the average beta of 1 is calculated as the sum of beta signals (equally weighted), the qualitative overlay (applied only in exceptional cases), and the subindustry correction factor. To calculate a company's overall exposure score, the **Overall Subindustry Exposure Score** is multiplied by the company's overall beta.

Beta Signals

Exhibit 22 shows how beta signals are aggregated in the Core Framework to arrive at the final beta, using for an illustrative example of a fictive automotive company.

Exhibit 22 Beta Signals – Aggregation to Overall Beta in Core Framework – Illustrative Example for a Fictive Automotive Company

Beta Indicator	Beta Signal*	Beta Component	Beta Component Signal**
Carbon Emissions	- 0.02	Product & Production	- 0.01
Carbon Solutions Offering	+ 0.01		
Operating Performance	+ 0.03	Financials	+ 0.05
Solvency	- 0.02		
Financial Flexibility	+ 0.02		
Asset Performance	+ 0.02		
Environmental Impact of Products Risk	+ 0.03	Risk Events	+ 0.06
Carbon Impact of Products Risk	+ 0.03		
Exceptional Event Adjustment	± 0.00		
Geographic Water Risk	± 0.00	Geographic	+ 0.05
Regional Corruption	+ 0.05		
Sum of Beta Signals	**+ 0.15**		**+ 0.15**
Qualitative Overlay	- 0.05		
Subindustry Correction Factor	+ 0.01		
Baseline***	+ 1.00		
Overall Beta	**+ 1.11**		

Source: Morningstar Sustainalytics. Notes: In Core, all beta indicators are combined and applied to the overall exposure score as there is no MEI structure in the Core Framework. Although core beta indicators are a feature of the Core Framework, for demonstration purposes this exhibit only includes risk event indicators with beta signals other than zero. *Increments of 0.01 at the beta signal qualitative overlay, subindustry correction factor level, final markup rounded to the nearest 0.01 increment. **Sum of beta signals for each component. ***Subindustry default value.

Similar to the Comprehensive Framework, beta indicators in the Core Framework are translated into beta signals with the help of well-defined scoring algorithms. Scoring algorithms are indicator- and subindustry-specific and specific to the Core Framework. The latter means that for a given beta indicator, the scoring algorithm that is applied in the Core Framework is typically different from the one that is applied in the Comprehensive Framework, even for the same beta indicator, to reflect the fact that the beta signal now speaks to the overall level rather than to an individual MEI level (signals need to have smaller values in the Core Framework). A subindustry- and indicator-specific scaling factor is applied to the respective beta indicators.

Manageable Risk Factors

In contrast to the Comprehensive Framework, the Core Framework applies to a **Manageable Risk Factor (MRF)** at the overall level, rather than at the issue level. The level of **Overall Manageable Risk** for each subindustry is determined by the subindustry exposure and manageable risk factors that are used within the Comprehensive Framework. As Exhibit 23 shows, the MRF is calculated by dividing the overall manageable risk for a subindustry by the overall subindustry exposure, with the ultimate result rounded to two decimal places.

Exhibit 23 Core Framework – Overall Manageable Risk Factor Calculation – Illustrative Example: Publicly traded Tobacco Company

Baseline / Material ESG Issue	Subindustry Exposure	Manageable Risk Factor	Manageable Risk
Corporate Governance	7.0	1.00	7.0
Stakeholder Governance	2.0	1.00	2.0
Business Ethics	7.0	0.95	6.7
E&S Impact of Products and Services	9.0	0.30	2.7
Human Rights - Supply Chain	4.0	0.80	3.2
Human Capital	4.0	0.95	3.8
Land Use and Biodiversity - Supply Chain	3.0	0.80	2.4
Product Governance	5.0	0.60	3.0
Water Use - Own Operations	4.0	0.80	3.2
Water Use - Supply Chain	4.0	0.80	3.2
Sum	**49.0**	**-**	**37.2**
Overall MRF (= Manageable Risk / Subindustry Exposure)	**-**	**-**	**0.76**

Source: Morningstar Sustainalytics

As explained in step one of determining the overall subindustry exposure, adjustments to the manageable risk might be applied to a subindustry's manageable risk factor calculation, for example, if an issue is disabled frequently for a subindustry in the Comprehensive Framework.

Management Dimension

Like the Comprehensive Framework, the second dimension in the Core Framework is Management, which is defined identically in both frameworks. It speaks to how well a company is mitigating its ESG exposure through suitable policies and initiatives and how these efforts are reflected in the actual ESG performance of a company.

The management score is determined by aggregating the weighted individual management and risk event indicator scores and a **Constant** value. Indicator selection, weights, and the constant value are determined at the subindustry level by a regression model, which aims to minimize the difference between the known company management scores (as determined by the Comprehensive Framework) and the predicted company management scores (as determined by the Core Framework). Other differences in the management calculations in the Core Framework include the application of weights for risk events, as further explained below.

The Constant

Because the Core Framework relies on a focused indicator set, the rating includes a constant value that is added to the management scores to improve the predictive power of the model. The constant value represents the contribution to the management score that would be expected from indicators that are not in the Core Framework's focused indicator set but are used in the Comprehensive Framework. The constant is set at the subindustry level. It varies because the ability to explain the scores from the reduced indicator set varies between subindustries or industries.

In addition, the constant may differ between private and publicly traded companies because their respective indicator sets may differ. The value of the constant can change at the company level as a result of risk events and in accordance with our ESG Risk Ratings' risk events weight shift, whereby some of the weight of the constant and the management indicators is shifted to the risk event indicator(s).

Risk Event Indicators

As within the Comprehensive Framework, risk event indicators in the Core Framework always receive a raw score of 0. The differentiation takes effect via the weight of the respective event indicator in the management score calculation. This weight increases with the severity of a risk event, diluting the contributions of all management indicator scores.

However, the Core Framework applies risk event indicator weights at the overall level, rather than at the issue level. This necessitates an adjustment to the weights we assigned to each risk event category in the Comprehensive Framework. The Core Framework risk event indicator weights are described in Exhibit 24.

Exhibit 24 Risk Events Weight Shift in the Core Framework

Risk Event Category	Category 0	Category 1	Category 2	Category 3	Category 4	Category 5
Risk event indicator raw score	0	0	0	0	0	0
Risk event indicator weight shift	0%	0%	0%	25%	50%	75%

Source: Morningstar Sustainalytics

Systemic ESG Issues and Idiosyncratic Issues

The logic of systemic event issues and idiosyncratic issues is also applied to the Core Framework but is implemented differently compared to the Comprehensive Framework because the Core Framework follows a top-down approach in assessing company exposure at the subindustry level.

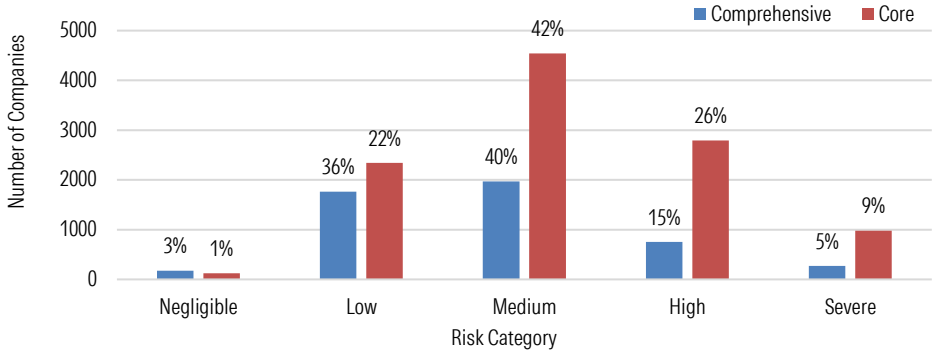
In the Core Framework, the associated event-based beta indicator is applied to the company's exposure dimension, and, on the management dimension, the respective event indicator receives a score and weight assigned according to the above explained weight shift and dilution logic. A qualitative overlay may be used to fine tune the exposure adjustments of the event, based on the analyst's assessment.

Unmanaged Risk

As mentioned above, the waterfall logic of the ESG Risk Ratings applies to both frameworks. Risks can be decomposed and reassembled in the same manner. This is also true for how exposure and management scores are pulled together to form the unmanaged risk score (i.e., the final rating) for a company. Unmanaged risk scores generated within the Core Framework are fully comparable with those generated within the Comprehensive Framework. Hence, the same thresholds for assigning companies to our five risk categories (negligible, low, medium, high, severe) are applied.

The empirical score distributions of the two frameworks differ in shape, as shown in Exhibit 25 below. This occurs because the Core companies tend to be smaller and tend to have lower levels of disclosure. This creates uncertainty for stakeholders, which can be interpreted as risk and, hence, explains why the distribution of the Core companies across risk categories presents a tilt towards 'high' and 'severe'.

Exhibit 25 Risk Categories – Comparison between Comprehensive and Core Distributions*



Source: Morningstar Sustainalytics. As of December 2023.

Calculating the ESG Risk Ratings in the Core Framework

Optimization Approach

The Core Framework uses a focused set of indicators to generate outcomes that are consistent and comparable with those that are generated based on the Comprehensive Framework. To arrive at this focused set of indicators, we used advanced regression modelling techniques that provide an optimized selection of indicators and indicator weights for each subindustry.

Indicator Selection

Indicators have not been selected for inclusion in the model individually, but rather as a set accomplishing the strongest correlation between a company's predicted management score and its known management score. This is our preferred approach, instead of choosing individual indicators that have a strong correlation with the overall score, as often it is a combination of indicators that creates correlation.

In addition, certain indicators might be only relevant for publicly traded companies, so we further differentiate the subindustry-based combination of indicators between publicly traded companies and Core companies.

The above optimization procedure has been performed based on our Standard Ratings universe, which comprises all companies to which our Comprehensive Framework is applied. The parameters of the **Core Model** are reviewed on a regular basis and indicator weights are recalibrated, if necessary. Our general process for optimizing weights is described in the following section.

Weight Optimization

The weights of indicators in our Core model are optimized for each subindustry using an iterative optimization approach. Weight combinations are tested to find the weights that minimize the deviation between the 'predicted' management scores from the reduced Core model and in the 'known' management scores from the full **Comprehensive Model**.

In most cases, this optimization is performed not on individual subindustries, but on groupings of similar subindustries to obtain a reasonable sample size. The weight optimization may include certain constraints, like a maximum indicator weight or removal of certain indicators, if these are frequently disabled in the Comprehensive Framework.

Methodology Context

This section provides details on the considerations applied in the creation of the methodology as well as information that supports its understanding.

The ESG Risk Ratings measure the degree to which a company's enterprise value is at risk due to ESG factors. The ratings assess ESG corporate risks solely from a financial materiality perspective to inform investor decision-making. No other materiality perspectives are considered.

The philosophy of the rating was in part developed based on learnings from the paper "Corporate Sustainability: First Evidence on Materiality" by Khan, Serafeim and Yoon (2015). This paper provided evidence that companies with good performance on managing exposure to material ESG issues outperform those with poor performance on these issues, in terms of future stock market performance and profitability margins. Notably, an underlying premise of the ESG Risk Ratings is that the world is transitioning to a more sustainable economy and that the effective management of ESG risks should, therefore, (all other things being equal) be associated with superior long-term enterprise value.

Consideration of the 'E', 'S' and 'G' Dimensions

The ESG Risk Ratings are based on a material ESG issue approach, rather than on a strict distinction between the environmental, social, and governance factors. For each company, ESG risks are measured by evaluating a set of material ESG issues based on both the company's exposure to and management of those issues, aggregating the 'E', 'S' and 'G' dimensions. MEIs do not always assess distinct environmental, social, or governance factors, but they can encompass a combination of related topics. As shown Exhibit 26, the same MEI can cover more than one 'E', 'S' or 'G' dimension.

Exhibit 26 Coverage of 'E', S' and 'G' Dimensions by Material ESG Issue (MEI)

Environmental	Social	Governance
Carbon - Own Operations	Access To Basic Services	Corporate Governance
Carbon - Products and Services	Business Ethics	Stakeholder Governance
Community Relations	Carbon - Own Operations	Bribery and Corruption
E&S Impact of Products and Services	Carbon - Products and Services	Business Ethics
Emissions, Effluents and Waste	Data Privacy and Cybersecurity	E&S Impact of Products and Services
ESG Integration – Financials	Emissions, Effluents and Waste	ESG Integration – Financials
Land Use and Biodiversity	ESG Integration – Financials	Product Governance
Land Use and Biodiversity - Supply Chain	Human Capital	
Occupational Health and Safety	Human Rights	
Product Governance	Human Rights - Supply Chain	
Raw Material Use	Occupational Health and Safety	
Resource Use - Supply Chain	Product Governance	
Stakeholder Governance	Raw Material Use	
Water Use - Own Operations	Resilience	
Water Use - Supply Chain		

Source: Morningstar Sustainalytics

The weighting of the 'E', S' and 'G' dimensions within the rating is different for each company, since they are calculated based upon the level of material exposure companies face from different ESG issues. Hence, a company that has high exposure to environmental factors, like pollution and biodiversity, with low exposure to social and governance factors, will have a relatively high environmental weight. Exhibit 27 illustrates the coverage of some specific E, S and G factors by material ESG issue.

Exhibit 27 Coverage of ESG Factors by Material ESG issue

E/S/G	ESG Factor	Material ESG Issue (MEI)
E	Climate Change Mitigation	Carbon – Own Operations Carbon – Products & Services ESG Integration – Financials
E	Water and Marine Resources	Water Use – Own Operations Water Use – Supply Chain Land Use & Biodiversity Land Use & Biodiversity – Supply Chain
E	Resource Use and the Circular Economy	Water Use – Own Operations Water Use – Supply Chain Land Use & Biodiversity Land Use & Biodiversity – Supply Chain E&S Impact of Products & Services
E	Pollution	Emissions, Effluents & Waste
E	Biodiversity and Ecosystems	Land Use & Biodiversity Land Use & Biodiversity – Supply Chain
S	Diversity, Equity and Inclusion in the Workplace	Human Capital
S	Working Conditions	Human Capital Occupational Health & Safety
S	Human Rights	Human Rights Human Rights – Supply Chain
G	Governance Bodies	Corporate Governance
G	Internal Control and Risk Management Systems	Corporate Governance Business Ethics
G	Business Ethics and Corporate Culture Systems	Business Ethics Stakeholder Governance

Source: Morningstar Sustainalytics

For issues that cannot be mapped to a single E, S or G dimension, the exposure is split between the relevant factors based on the E, S or G designation and relative weight of the management indicators within the issue. All management indicators map to only one E, S or G dimension. Environmental issues contribute an average of 27% of an ESG Risk Rating score, with a range between 1% and 70%, depending on the company being assessed. Social issues contribute an average of 35% of the rating score, with a range between 6% and 61%, depending on the company being assessed. Governance issues contribute an average of 39% of the rating score, with a range between 20% and 72%, depending on the company being assessed.

Coverage of Environmental Topics

The following environmental topics are included in Material ESG Issues: Carbon - Own Operations, Carbon - Products and Services, Community Relations, E&S Impact of Products and Services, Emissions, Effluents and Waste, ESG Integration - Financials, Land Use and Biodiversity, Land Use and Biodiversity - Supply Chain, Occupational Health and Safety, Product Governance, Raw Material Use, Resource Use - Supply Chain, Stakeholder Governance, Water Use - Own Operations, Water Use - Supply Chain.

Based on the materiality of the issue, some rated items' evaluations include assessments of targets and objectives of the Paris Agreement. This is achieved through a management indicator, E.1.7.0 - GHG Reduction Programme. This indicator evaluates whether the company has GHG reduction targets, including interim targets, whether those targets are science-based and several other measures surrounding the implementation of those targets. Since climate issues represent a single component of the broader ESG assessment, the contribution of this indicator and the targets of the Paris Agreement are rather limited, with a contribution to the management score that ranges between 0% and 4.2%.

The ESG Risk Rating is not calibrated to – and does not systematically measure – the percentage of taxonomy-aligned revenues, capital expenditure or operating expenditure disclosed under the EU taxonomy for sustainable activities. As a result, there is no predefined or targeted level of correlation between the environmental component of the ESG Risk Rating and the company's reported EU taxonomy alignment. For some issuers, a higher level of taxonomy-aligned activities may coincide with lower unmanaged environmental risk.

Disclosures made under the EU taxonomy, as well as other international environmental agreements and frameworks (such as the Paris Agreement and related climate and biodiversity initiatives), may be used as contextual or supporting inputs for specific indicators, where relevant and available. However, the environmental dimension of the ESG Risk Rating is derived from Morningstar Sustainalytics' own risk-based methodology and may therefore deviate from the degree of EU taxonomy-alignment or from the minimum requirements and classifications set out in those frameworks. These deviations reflect differences in scope (e.g., coverage of additional environmental risks beyond taxonomy-eligible activities), focus (financially material risk versus activity-based alignment), and the integration of controversies and forward-looking risk considerations.

Coverage of Social and Governance Topics

The following social topics are included in Material ESG Issues: Access To Basic Services, Business Ethics, Carbon - Own Operations, Carbon - Products and Services, Data Privacy and Cybersecurity, Emissions, Effluents and Waste, ESG Integration - Financials, Human Capital, Human Rights, Human Rights - Supply Chain, Occupational Health and Safety, Product Governance, Raw Material Use, Resilience.

The following governance topics are included in Material ESG Issues: Corporate Governance, Stakeholder Governance, Bribery and Corruption, Business Ethics, E&S Impact of Products and Services, ESG Integration - Financials, Product Governance.

To ensure the robustness of the assessment of a company's performance in managing social and governance issues, many of our management indicators consider companies' alignment with relevant

international agreements, standards, and initiatives. Exhibit 28 shows some of the international frameworks considered in the assessment of management indicators.

Exhibit 28 International Frameworks considered in management assessment

Indicator name	International Standards/ Agreements / Initiatives
Discrimination Policy Indigenous Rights Policy Scope of Social Supplier Standards Working Hours Policy Human Rights Policy	International Labor Organization (ILO)
Food Retail Initiatives	The Global Food Safety Initiative Organic Trade Association The Roundtable on Responsible Soy The Roundtable on Responsible Palm Oil The Roundtable on Cacao The Marine Stewardship Council for Certified Fish
Cybersecurity Programme	ISO 27001 standards
Data Privacy Policy	Payment Card Industry Data Security Standard Secure Socket Layer Transport Layer Security
Technology Product Security Programme	Payment Card Industry Data Security Standard ISO/IEC 15408 (Common Criteria) Federal Risk and Authorization Management Program Cloud Security Alliance Federal Information Processing Standards Service Organization Control 2
Access to Medicine Programme	World Health Organization London Declaration on Neglected Tropical Diseases
Neglected Diseases R&D	Drugs for Neglected Diseases Initiative Global Alliance for TB Drug Development Medicines for Malaria Venture
Transparency on Payments to Governments – Extractives	Extractive Industries Transparency Initiative
ESG Reporting Standards	IFRS Sustainability Disclosure Standards Sustainability Accounting Standards Board
Animal Testing Policy	Laboratory Animal Care International Leaping Bunny Programme

Source: Morningstar Sustainalytics

E/S/G Cluster Scores

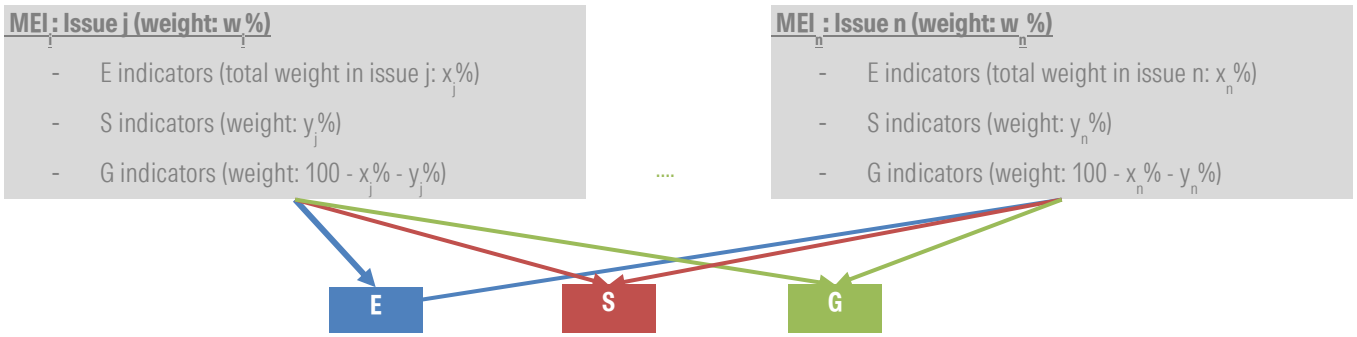
For instances in which the 'E', the 'S' and the 'G' dimensions should be analyzed separately, we introduced the **E/S/G Cluster** scores for the ESG Risk Ratings. Notably, the clusters do not play any role in the ESG Risk Ratings architecture and scoring model. Below we explain how the E/S/G cluster scores are calculated and how they are empirically distributed.

The E/S/G Cluster Scoring Model

We calculate E/S/G cluster scores as linear combinations of company-specific MEI unmanaged risk scores, exposure scores, and management scores. They add up to the final ESG Risk Ratings scores at the overall level, ensuring that the ESG Risk Ratings remain a closed and fully consistent system. The interpretation of the **Cluster Unmanaged Risk** scores is the same as it would be for a single MEI or for the overall level, i.e. they are measuring to what degree the company's economic value is at risk, driven by environmental, social or governance factors.

Exhibit 29 shows how we create E/S/G cluster scores based on individual indicator weights within the different material ESG issues.

Exhibit 29 E/S/G Cluster Scores as Linear Combinations of MEI Scores



Source: Morningstar Sustainalytics

The three cluster scores can be added to arrive at the overall unmanaged risk score for a company. Weights for calculating risk scores are adjusted by respective manageable risk factors. The E/S/G cluster methodology preserves the modular architecture of the rating.

Categories

As described in the Methodology Description section, based on the unmanaged risk scores, companies are assigned to one of five categories of ESG risk. The ESG Risk Categories at Overall Level and their respective globes are described in Exhibit 30.

Exhibit 30 ESG Risk Categories at Overall Level

Risk Category	Overall Unmanaged Risk	ESG Globes Rating	Description	Risk Category
Negligible	0 to 9.99	5 Globes	ESG factors are considered to drive negligible risk to enterprise value.	Negligible
Low	10 to 19.99	4 Globes	ESG factors are considered to drive low risk to enterprise value.	Low
Medium	20 to 29.99	3 Globes	ESG factors are considered to drive medium risk to enterprise value.	Medium
High	30 to 39.99	2 Globes	ESG factors are considered to drive high risk to enterprise value.	High
Severe	40 or above	1 Globe	ESG factors are considered to drive severe risk to enterprise value.	Severe

Source: Morningstar Sustainalytics

General Principle of ESG Risk Ratings Scoring

The five categories of risk in our rating are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all covered subindustries. This means that a bank, for example, can be directly compared with an oil company or any other type of company. Following the principle of equivalence, one point of risk is one point of risk, regardless of which company or which issue it applies to. Additionally, points of risk add up across issues to create overall scores. With the ESG Risk Ratings scores, we have introduced a 'single currency' for ESG risk.

The fundamental concept of points of risk gives the ESG Risk Ratings a fully modular structure. Issue-level exposure scores can be aggregated to arrive at an overall exposure score, for example, or to arrive at scores for combinations of issues that might be of interest for investors from a thematic perspective (e.g., carbon risk).

Benchmarking

In addition to providing company level assessments, Morningstar Sustainalytics also provides data that can help support comparisons of each company within the ESG Risk Ratings universe, industry, and subindustry at the issue and overall level. Key metrics are:

- **Average ESG Risk Ratings score**: The average issue or overall score of the ESG Risk Ratings for all relevant companies (in relation to the chosen company) that have a rating. It can be compared with the company ESG Risk Ratings score at the issue or overall level to consider whether the company is scoring better or worse than average, compared to its subindustry, industry, or the universe.
- **Percentile**: The percentile rank of the chosen company's overall score of the ESG Risk Ratings, compared to all relevant companies that have a rating. It is calculated by dividing the company's rank by its coverage count. A lower percentile indicates the company has a relatively lower risk due to ESG factors.
- **Rank**: The rank of the chosen company's overall score of ESG Risk Ratings compared to all relevant companies that have a rating. A lower rank indicates the company has a relatively lower risk due to ESG factors.

Data Sources

Overview of Data Sources

Data for the ESG Risk Ratings is sourced primarily from companies, including their annual reports, corporate sustainability reports, and data collected from their website. All corporate information is sourced from publicly available documents or from third party data providers. We do not use non-public, confidential or privileged information in our research.

Morningstar Sustainalytics does not rely exclusively on the sustainability reporting standards developed under the EU taxonomy and the Sustainable Finance Disclosure Regulation (SFDR). Where such disclosures are publicly available and relevant to the assessment of a specific indicator or Material ESG Issue, they may be used as one source of information within our broader data collection process. Similarly, information reported under the European Sustainability Reporting Standards (ESRS), including companies' climate transition plans, may be incorporated into the analysis when it provides substantiated, decision-useful evidence of a company's management systems, governance structures, or preparedness for climate-related and sustainability-related risks. Any such information is reviewed alongside other public disclosures, company-reported documents, and third-party sources to ensure consistency with Morningstar Sustainalytics' analytical standards and indicator-specific requirements.

In addition to the internal collected data obtained from company reporting, Morningstar Sustainalytics also receives data from the following sources that may be integrated into some of the assessments supporting the ratings: Morningstar Equity Data team (financial information), government reporting, industry associations, NGOs, media and regulators. These data sources can be used either systematically (e.g., each company incorporates data from the same source) or in an ad hoc manner (e.g., different data sources used for the same indicator across different rated items). In either case, the data are subject to guidelines concerning their appropriateness to ensure that the data meet content requirements (the data are matched to what we are trying to collect) and are timely and accurate enough to be used in decision-making.

Data Models and Use of Estimates

The rating is supported by two models for the data used:

- **Metric-based indicator scoring model**: A key assumption of this model is that better performance on a given metric relative to the rated item's peers signals stronger management of risks.
- **Criteria-based indicator assessment model:** These indicators have criteria that are typically connected to best international practices in terms of reporting requirements and guidelines. A key assumption of this model is that following best practice, as indicated by meeting the criteria of the indicator, is indicative of stronger risk management.

For some indicators that use the metric-based indicator scoring model, Morningstar Sustainalytics applies subindustry or industry benchmarks to calculate the output (e.g., NOx emissions, carbon intensity). These indicators assess a company's ESG performance or risk by comparing its reported

metric for a given fiscal year against the relevant subindustry or industry benchmark, primarily using a percentile-based approach.

In limited cases where data is unavailable, we use metric estimates based on computation engines that use multiple inputs to estimate a quantitative output (e.g., GHG emissions).

Use of Artificial Intelligence (AI)

The data collection process is supported by machine learning–based tools, designed to identify keywords and text in documents that may meet the criteria of a management indicator or provide values for a metric-based indicator. There are two main risks with this approach:

- The tool may falsely identify that a criterion is met when it is not (low precision).
- The tool may fail to detect when a criterion is actually met (low recall).

These risks are mitigated by the fact that most data points used in the rating are also reviewed by a human analyst. The AI tools are intended to support, not replace, the analyst's role in verifying whether criteria are met and in determining metric values through document review.

Data quality Assurance Procedures

Morningstar Sustainalytics research and data analysts ensure that all information meets internal standards for accuracy, completeness, and timeliness. Sources must comply with internal standards for credibility and authenticity. Depending on the information type, quality assurance procedures may include:

- Verifying that corporate policies and procedures apply to a sufficient proportion of a company's operations.
- Third-party verification of corporate disclosures.
- Analyst peer reviews.
- Fact checking by researched companies.
- Validation rules to identify inconsistencies, significant score changes, or unexpected outcomes.
- For quantitative data, minimum thresholds for data completeness and benchmarking.
- Rule-based checks for accuracy and completeness that are built into data platforms.

Clients can provide factual feedback to address any potential errors, in line with the ESG Risk Ratings methodology, by contacting the Issuer Relations & Investor Support Team.

Third-party data

Morningstar Sustainalytics incorporates third-party data in a limited number of assessments. In most cases, this data consists of reported information (e.g., financial data such as revenues). In some instances, third-party sources may provide aggregated assessments that incorporate expert judgment or modeled outputs (e.g., country-level water risk assessments).
To ensure appropriate use of such data, Morningstar Sustainalytics applies the following safeguards:

- Relevance and reasonability review: Third-party data is evaluated to confirm that it is suitable for the specific indicator or assessment and aligns with the intended analytical purpose.
- Credibility and transparency: Only data from reputable and recognized providers is used. When third-party data contributes to an assessment, it is cited as the source of information.
- No endorsement or reliance on proprietary judgments: Morningstar Sustainalytics does not adopt or endorse the conclusions of third-party providers. Instead, such data is treated as one input among several, subject to internal review and applied within the parameters of the ESG Risk Ratings methodology.

This approach ensures that third-party data enhances the robustness of the rating while maintaining analytical independence and mitigating risks associated with external data inputs.

Frequency of Data Updates

Ratings inputs are regularly updated to account for updated reporting and a changing operating environment for companies. This includes reviewing all available sources, such as corporate reporting, update management indicators, beta indicators, reviewing the applicability and materiality of ESG issues, manageable risk factors, exposure scores, and risk event indicators. This regular update is usually conducted once a year.

In addition to the regular update, underlying indicators may be updated at other points during the year due to research alignment with company reporting cycles or the timing of the availability of peer or universe research that is required to score relative performance indicators. Moreover, additional underlying indicators, particularly risk event indicators, may be updated outside of the regular update cycle if there is an incident considered material enough to warrant such an update.

Due to different research cycles, the data contained within the rating may reflect various reporting periods. Intensity metric indicators are updated on a separate schedule from other management indicators. For example, GHG emissions data that is used for the carbon intensity indicator could reflect reporting for FY2024, while the management indicator for Renewable Energy Use for the same company could reflect data from a FY2025 report. Although we attempt to match research cycles as much as possible, the potential mismatch reflects a desire to provide the most up to date information to our clients, regardless of the fiscal year of reporting.

When a financially material risk event occurs at a company, it is incorporated into the rating as soon as possible. The process for incorporating risk event information is to identify the event (through daily screening of news sources), assess the event, perform quality control checks (e.g. approval by peers or oversight committee) and publish the risk event rating. This process usually takes between three to -10 days after the event has occurred.

Major New Information

Major new information that could affect the rating typically stems from corporate actions such as mergers, acquisitions, or a change in the business model of the rated item.

If a company is acquired, the research for that company's standalone rating stops, but its rating will be available one quarter after the acquisition. After that, the rating will no longer be provided or that company will be part of an assessment connected to the acquiring company.

When a company makes a significant acquisition, it will maintain its current rating until new information is identified and can be incorporated. Corporate actions are integrated into a company's rating as soon as possible after being recognized by our corporate data provider. In extreme cases, this could take up to one year, depending on when the acquisition happened in relation to the annual update cycle.

Additional Details on Data Sources

Comprehensive Framework

Additional details on each data source contributing to the rating are provided in Exhibits 31 and 32, which list the data sources used for each component of the ESG Risk Rating, with further details on the criteria used to select that data source and what techniques are used when the data provided by the source is incomplete (does not cover the full universe of companies evaluated). Morningstar Sustainalytics considers the information available to it for the purpose of providing ESG Risk Ratings to be of satisfactory quality.

Exhibit 31 Data Sources for the Comprehensive Framework

Component	Parameter	Input Data Used	Selection Criteria	Incomplete Data Techniques
Material ESG Issues (MEIs)	**Subindustry Exposure Score**	Morningstar Sustainalytics considers a range of relevant data points including Morningstar Sustainalytics' Controversy Research, structured internal and external quantitative data (e.g., NOx, SOx, Carbon emissions) and third-party research and materiality frameworks (e.g., WWF Water Risk Filter, SASB)	In house data/ research – N/A Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
	Issue Beta	Morningstar Sustainalytics Beta Indicators Indicators are assessed based on in-house data/ research and third-party data/ research (e.g., World Bank Worldwide Governance Indicators, World Resources Institute Aqueduct)	**Indicator selection:** Indicators are selected based on their thematic relevance for different subindustries and MEIs **Source selection:** In house data/ research – N/A Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
	Management Score	Morningstar Sustainalytics ESG Management indicators Indicators are assessed based on in-house data/ research, researched companies' disclosures (e.g., Annual Reports, Sustainability Reports, Codes of Conduct, and other corporate policies and procedures, websites), information provided by researched companies directly to Sustainalytics, as well as information from third parties such as civil society, governments, industry associations, investors, media, and regulators	**Indicator selection:** Indicators are selected based on both their thematic relevance for different subindustries and MEIs, and Sustainalytics Research & Methodology experts' determination of what management is needed for mitigating risk exposure **Source selection:** In house data/ research – N/A Researched companies' disclosures – authenticity, credibility Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
Baseline Issues (Corporate Governance &	**Subindustry Exposure Score**	Companies' ownership structure – public vs private	In-house data/ research – N/A	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by

Stakeholder Governance)				Research & Methodology experts in case reported data is not available
	Issue Beta	Morningstar Sustainalytics Beta indicators Indicators are assessed based on in-house data/ research	**Indicator selection**: Indicators are selected based on their relevance for each Baseline Issue - Source selection: In house data/ research – N/A	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
	Management Score	Morningstar Sustainalytics ESG Management indicators Indicators are assessed based on in-house data/ research, researched companies' disclosures (e.g., Annual Reports, Sustainability Reports, Codes of Conduct, and other corporate policies and procedures, websites), information provided by researched companies directly to Sustainalytics, as well as information from third parties such as civil society, governments, industry associations, investors, media, and regulators	**Indicator selection**: Indicators are selected based on both their relevance for each Baseline Issue and Sustainalytics Research & Methodology experts' determination of what management is needed for mitigating risk exposure **Source selection**: In house data/ research – N/A Researched companies' disclosures – authenticity, credibility Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
Systemic ESG Issues		Morningstar Sustainalytics Systemic Events	Systemic events with Category 4 or 5, i.e., sea change events that are unpredictable in nature and affect large sets of companies at the same time and across a multitude of ESG issues	No estimation or extrapolation required
Idiosyncratic Issues		Morningstar Sustainalytics Controversy Research (Risk Events scores)	Risk events with category 3, 4 or 5 not associated by default with the subindustry, i.e., Risk Events that are atypical for the typical company in its respective subindustry	No estimation or extrapolation required

Source: Morningstar Sustainalytics

Core Framework

The Core Framework does not break down a company's ESG Risk Rating to the level of model components – MEIs, baseline issues, systemic and idiosyncratic issues. While most of the input data and selection criteria mentioned above are applicable to the Core Framework at the company overall level, there is one notable difference regarding ESG management indicators' selection: while for the Comprehensive Framework indicators are manually selected based on their thematic relevance, the selection in Core is automated, based on a regression model.

Exhibit 32 Data Sources for the Core Framework

Parameter	Input Data Used	Selection Criteria	Incomplete Data Techniques
Subindustry Exposure Score	Morningstar Sustainalytics considers a range of relevant data points including Sustainalytics' Events research, structured internal and external quantitative data (e.g., NOx, SOx, Carbon emissions) and third-party research and materiality frameworks (e.g., WWF Water Risk Filter, SASB). In the Core Framework, the Subindustry Exposure Score is the sum of all MEI-level scores activated in the Comprehensive Framework for a given subindustry	In house data/ research – N/A Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available

Company Beta	**Morningstar Sustainalytics Beta Indicators** Indicators are assessed based on in-house data/ research and third-party data/ research (e.g., World Bank Worldwide Governance Indicators, World Resources Institute Aqueduct)	- **Indicator selection:** Beta indicators selected for inclusion in the Comprehensive Framework are automatically included in the Core Framework, with few exceptions - Source selection: In house data/ research – N/A Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available
Company Management Score	**Morningstar Sustainalytics ESG Management indicators** Indicators are assessed based on in-house data/ research, researched companies' disclosures (e.g., Annual Reports, Sustainability Reports, Codes of Conduct, and other corporate policies and procedures, websites), information provided by researched companies directly to Sustainalytics, as well as information from third parties such as civil society, governments, industry associations, investors, media, and regulators	- **Indicator selection:** ESG Management indicators are selected from the pool of indicators active for a given subindustry in the Comprehensive Framework based on regression modelling techniques which ensure that Core outcomes are consistent and comparable with Comprehensive ones - Source selection: In house data/ research – N/A Researched companies' disclosures – authenticity, credibility Third party data/ research – quality, comprehensiveness	Morningstar Sustainalytics employs proprietary estimation models and uses qualitative assessments by Research & Methodology experts in case reported data is not available

Source: Morningstar Sustainalytics

Research Approach

Morningstar Sustainalytics conducts its ESG research using a structured process that combines regular research updates with continuous monitoring of ESG events. Regular research updates are driven by the collection and analysis of data from publicly available information, including corporate reports and regulatory filings, global media and news sources, as well as third-party research from NGOs and industry organizations. This information is used by specialized sector analysts to conduct exposure and management assessments based on the beta and management indicators selected for a given subindustry. For each material ESG issue/subindustry combination, management, beta and risk event indicators are selected based on expert assessments and, wherever relevant, industry standards, recognized best practices, and global reporting frameworks.

In addition to the default indicators defined for a specific subindustry, analysts assess company-level exposure vis-a-vis each MEI and have the option to apply a qualitative overlay, which is added to all the other beta components to arrive at the final issue beta. Potential reasons for qualitative overlays include (1) situations in which company-specific factors are not reflected in the beta signals coming from beta indicators or (2) situations in which the beta signals, either individually or collectively, do not yet reflect recent developments. The application of qualitative overlays is guided by methodological principles and processes that ensure that the overlays are appropriate and applied consistently for similar cases. Each qualitative overlay carries a rationale explaining the reasons behind it.

The computation of the final ESG Risk Ratings score is done automatically, considering all the components assessed by sector analysts. All company assessments undergo multiple layers of quality control before publication. This includes peer reviews and quality assurance checks designed to validate the accuracy and consistency of the research. Finally, all ratings are subject to formal approval by a Ratings Committee before publication.

In parallel with the regular update cycle, Morningstar Sustainalytics performs daily monitoring of media and news to identify significant ESG incidents and emerging risk events. Potential incidents are subject to an incident analysis and event assessment process, followed by quality and peer review. All event changes are subject to formal approval by a Ratings Committee before publication.

Enhanced Research

Morningstar Sustainalytics applies an Enhanced Research Approach to a defined subset of companies assessed under the Comprehensive Framework. Eligibility for Enhanced Research is primarily driven by a company's inclusion in designated financial indices.

Under this approach, analysts conduct additional, targeted review beyond the standard research approach. While qualitative overlays, indicator disabling, and other research tools may also be applied to non-enhanced research companies when analytically appropriate, Enhanced Research involves a more systematic and in depth application of these methods. This may include:

- Applying qualitative overlays to exposure assessments.
- Disabling management indicators or MEIs when evidence demonstrates they are not reflective of the company's actual risk profile.

- Soliciting issuer feedback prior to each major update. Note: This refers to ongoing updates. Engagement is conducted for all companies regardless of framework or research approach for the first-issuance of a rating.

Enhanced Research is typically applied to large and mid-cap companies in developed markets, large cap companies in emerging markets, and issuers across the corporate bond universe. Analysts may extend this approach to additional companies based on factors such as reporting quality, organizational complexity, or other considerations relevant to developing an accurate ESG risk profile.

Companies assessed using the Enhanced Research Approach are clearly flagged so that clients can readily identify them.

Engagement

In accordance with regulatory requirements, at least two full working days prior to the first issuance of an ESG Risk Rating, the Issuer Relations team notifies the company and/or any relevant issuer of the intention to issue the rating. Upon request, the team also provides any information required under applicable law. This notification allows the company and/or relevant issuer to review the underlying information and identify any potential factual inaccuracies.

For companies in the Comprehensive Framework for which the Enhanced Research Approach has been applied, the Issuer Relations team also provides such notifications prior to subsequent rating updates. The notifications can also be provided for companies in the Core Framework or for which the Enhanced Research Approach has not been applied, if requested by the issuer in advance. If the company submits feedback that, in the judgment of ESG Sector Research team, warrants a change to the ESG Risk Rating in accordance with the applicable Methodologies, the rating is resubmitted to the Rating Committee for further consideration.

Timeframe

ESG Risk Ratings are considered current and valid from their date of publication until one of the following occurs:

- **A new ESG Risk Rating is published**. When a company rating is published, the latest published version immediately replaces the prior version. The older rating remains available only as a historical reference.
- **No new rating has been published for at least 24 months (730 days)**. The 24-month validity period reflects the relatively stable nature of ESG performance. In the short term, significant changes to ratings typically arise from corporate actions or controversies rather than updates to other management indicators and beta indicators. Sustainalytics maintains dedicated, ongoing monitoring processes for corporate actions and controversies (separate from the less frequent full profile update cycle) to ensure that corporate actions and controversies are reflected in ratings shortly after they occur.
- **The company is no longer included in the Sustainalytics ESG Risk Ratings Product Universe**. If an issuer is removed from the universe, the previously delivered rating may still exist in historical datasets. However, once the company is no longer monitored for corporate actions and controversies, the continued validity of its rating cannot be assured.
- **Sustainalytics informs stakeholders that the rating has been withdrawn**. In rare situations, Sustainalytics may inform stakeholders that a rating has been withdrawn due to a material error, an exceptional situation that requires re-evaluation of the rating or an internal processing or quality control error. In these cases, Sustainalytics may note that the rating has been withdrawn and that the last published rating is no longer valid.

Governance, Review and Market Consultation

Review

Morningstar Sustainalytics conducts structured internal reviews of the ESG Risk Ratings methodology to ensure that the methodology continues to meet the criteria established in the Methodology Development & Modification Policy. Reviews are scheduled to take place within one calendar year of the previous review but are also required whenever there is a material modification to a methodology.

Governance

Any material and non-material modifications to the ESG Risk Ratings methodology can only be implemented following formal approval by the ESG Methodology Review Group. This group is comprised of senior subject matter experts from the Research & Methodology Team.

Market Consultation

Market consultation for the ESG Risk Ratings methodology may be conducted during any modification of this methodology. These consultations are subject to the External Consultation Global Procedure.

Initial Solution Consultation
During early-stage development, clients may be consulted to assess whether preliminary methodological approaches align with intended use cases. This consultation is open to all clients that have signaled that they are interested in providing input on Morningstar Sustainalytics methodologies.

Final Prototype Consultation
For rating methodologies, external consultation is required during the final prototype phase in the form of general market feedback. This consultation is publicly available on the Morningstar Sustainalytics website and feedback can be provided by any person or organization.

Revisions

The ESG Risk Rating Review

Our rating model and its components are designed for continuity. However, we recognize that ESG risks and our understanding of them are constantly evolving due to various factors including changes in regulation, societal perception, political sentiment, company operating structures, new scientific paradigms and the emergence of new business models. Additionally, the increasing adoption of sustainability standards by companies leads to a greater volume and quality of ESG information. To address this dynamic nature, we conduct an annual review of our ESG Risk Ratings model, known as the ESG Risk Ratings Review (ESG RR Review). This review is conducted at the subindustry level, focusing on the selection and scoring of material ESG issues (MEIs), the selection and weighting of indicators that are linked to these MEIs and the degree to which the identified risks can potentially be managed by companies (represented by our manageable risk factors). This process allows us to strengthen the assessment of model parameters, thus preserving the relevance and forward-looking feature of our ratings.

Enhancement of Methodology Model Components

In addition to MEIs, we periodically review the subcomponents of the methodology to ensure it remains relevant and incorporates the latest updates to covered norms and standards. The process may be triggered by updates to the covered standards or norms and may result in strengthening our model components, MEIs and indicators. This process comprises changes such as the development of new MEIs or indicators (e.g. the creation of MEI.22 Raw Material Use in 2024) or structural enhancements to existing MEIs or indicators (e.g. expanding the scope of MEI.6 Data Privacy and Cybersecurity to capture risks related to critical infrastructure or removing the impact component from event indicators).

Squads responsible for designing the methodology conduct structured desk-based research, including reviews of relevant academic literature, standards, and authoritative guidelines. The credibility and relevance of the issuing bodies and authors are assessed before determining whether the evidence should inform the methodology. Where feasible, science-based evidence is incorporated into the ratings and explicitly referenced in the methodology of documentation.

Typically, these updates take place on an annual basis. To ensure the accuracy and consistency of the methodology revisions, we conduct several impact analyses prior to implementation. These analyses assess how the changes will affect ESG Risk Rating scores and help determine whether they are delivering the desired outcomes. All changes are reviewed and approved by the ESG Methodology Review Group.

In addition, as part of the design phase for material methodological changes, Morningstar Sustainalytics engages with relevant external stakeholders to gather feedback on the proposed changes. This engagement typically takes place through review sessions or interviews, during which stakeholders are invited to provide feedback on the product prototype. Stakeholder feedback is considered in determining how proposed changes should be reflected in the final methodological solution, while ensuring consistency with Sustainalytics' analytical standards and internal governance processes.

Roling out Methodological Changes

Clients are given advance notice of upcoming changes that occur due to the ESG RR Review and structural changes, such as the addition of new data points, to support the integration of the ratings in our clients' research and investment analysis. Assessment changes and structural enhancements, as well as the research of corresponding new data points, are rolled out on a company-by-company basis in combination with the regular profile update.

Appendix

Descriptions of Material ESG Issues

MEI.0.CG Corporate Governance	Corporate Governance encompasses the mechanisms, processes, and policies by which a company is managed and overseen to ensure its ability to mitigate risks, increase long-term value creation and safeguard its reputation. It focuses on whether a company is run in a transparent and accountable way and whether its leadership acts in the best interests of stakeholders. Effective corporate governance ensures that a strong board provides strategic direction, oversees management and protects shareholder rights. It also involves structures that safeguard ownership interests, align management incentives with long-term value creation, and foster reliable financial reporting to maintain investor confidence. Poor corporate governance practices at high-profile companies have resulted in value destruction through record fines, bankruptcies, or the dilution of existing shareholder equity. A company's ownership structure, especially the concentration of ownership among major shareholders and its listing status, are primary drivers of Corporate Governance risk.
MEI.0.SG Stakeholder Governance	Stakeholder Governance encompasses the mechanisms, processes and policies used by a company to manage its extra-financial risks and broader stakeholder relationships beyond focusing solely on shareholders. It focuses on how companies manage their key environmental and social impacts through policies, programs, and adherence to certain standards, and how they report on these practices. Public and private companies across all industries are increasingly expected to demonstrate how they have considered their business impact on a broad range of stakeholders, beyond focusing solely on the needs of shareholders. Inadequate stakeholder governance structures expose companies to heightened scrutiny, and demand for transparency and action.
MEI.1 Access to Basic Services	Access to Basic Services refers to a company's ability to ensure access to health care products and services and manage risks related to cost effectiveness and price transparency. As healthcare costs continue to rise globally, public payors are increasingly pursuing regulatory interventions that focus on increasing price transparency and ensuring cost effectiveness. Companies that ensure their products have a strong value proposition are more likely to meet public payor expectations for cost-effectiveness in addition to patient needs. On the other hand, companies that rely on price gauging to drive revenue growth or fail to price products and services in line with patient value may face increased regulatory and operational risks. Access to Basic Services risks typically depend on how medically important a company's products and services are, their cost-effectiveness, history of pricing and alignment with patient value, and the state of regulatory oversight of pricing in an Exposure company's main markets.
MEI.4 Business Ethics	Business Ethics encompasses business practices that may be legal or illegal and result in financial benefit to an individual specifically or a company while having a negative impact on society or other company stakeholders. It focuses on how companies manage risks related to unethical business conduct, such as anti-competitive practices, bribery and corruption, money laundering, fraud or intellectual property rights violations. As regulators and authorities are placing more scrutiny on companies' compliance systems, unethical conduct can result in substantial financial penalties and legal fees if a company is caught violating regulations. Public exposure of unethical behavior can damage a company's reputation, trigger boycotts and erode sales. Internally, it can lead to a demoralized workforce and high turnover. Business Ethics risk is driven primarily by the nature of a company's activities, the state of its corporate culture, the location of its operations and the structure of the market in which it operates.
MEI.5 Community Relations	Community Relations focuses on how companies engage with local communities by assessing how they involve local communities in business decisions, minimizing adverse impacts on their wellbeing and foster sustainable community development over the long term. While companies can be drivers of economic growth, their activities may also have a negative impact on local communities through pollution, unequal economic benefits, and cultural disruption. Such adverse impacts may trigger community opposition, which can pose a significant financial risk to companies, through production

	disruptions or project cancellations. Furthermore, neglecting responsible environmental and social management exposes companies to substantial financial penalties, compensation costs, and long-term restoration liabilities. Community Relations risk is driven primarily by the nature of a company's activities and the location of its operations.
MEI.6 Data Privacy and Cybersecurity	Data Privacy and Cybersecurity cover a company's data governance practices, including collection, use, management, and protection of data, to ensure compliance with regulations, safeguard against breaches and address ethical concerns on data use. While customers' personally identifiable data collection empowers personalized services and innovation, organizations must navigate a complex landscape of increased risk and responsibility to safeguard customer information, encompassing data breaches, regulatory scrutiny, and potential ethical concerns around data monetization. Data Privacy and Cybersecurity risk is driven by three main aspects: the processing of customers' personal information, the vulnerability of a company's infrastructure to potential cyberattacks or data breach, and whether a company operates in a critical infrastructure industry.
MEI.7 Emissions, Effluents and Waste	Emissions Effluents and Waste encompass a company's practices to minimize non-greenhouse gas emissions, waste, and wastewater discharges across its operations, as well as its preparedness and response measures for potential pollution emergencies. Public health concerns and stricter regulations are driving increased scrutiny of companies that rely on potentially polluting materials. Companies that fail to manage pollution effectively face financial and reputational risks. Improper waste disposal or accidents can lead to clean-up costs, fines, operational disruptions and even shutdowns. Additionally, negative publicity from environmental scandals can damage companies' reputations, impacting consumer trust and profitability. Emissions, Effluents and Waste risk is primarily driven by the types of pollutants a company releases as part of its own operations and the level of damage they inflict.
MEI.8 Carbon – Own Operations	Carbon – Own Operations encompasses the management of risks linked to a company's energy use and greenhouse gas (GHG) emissions within its operational control, excluding emissions during the use phase/end-of-life cycle of its products. The issue underscores a company's commitment to lowering GHG emissions and energy use through direct strategic actions, innovative technology integration, and clear target setting. There has been increasing public scrutiny and political drive to curb global GHG emissions, in line with the goals of the Paris Agreement. Companies, therefore, should adapt their business models to mitigate the long-term risks associated with transitioning to a low-carbon future. Companies that do not adequately comply may face negative repercussions, including stranded assets, fines, penalties or reputational damage. Carbon – Own Operations risks can manifest across four key domains: regulations and carbon taxes, disclosure, lack of certification and lack of investment in carbon-reducing technologies.
MEI.8.PS Carbon – Products and Services	Carbon – Products and Services encompass a company's management of energy efficiency and greenhouse gas (GHG) emissions of its products and services during their use phase, excluding carbon risks related to financial services. The issue emphasizes the measures taken by a company to increase the energy and/or fuel efficiency of its products or services. In the accelerating shift towards a low-carbon economy, companies that lag in carbon risk management and adopt a low-carbon business model face significant challenges. These include potential misalignment with evolving regulatory frameworks, increased regulatory scrutiny, declining sales due to consumer preferences, and exposure to litigation and financial penalties. Carbon – Products and Services risk is driven by three key aspects: the regulatory environment, the carbon footprint of products and services, and customer demand.
MEI.9 E&S Impact of Products and Services	Environmental and Social (E&S) Impact of Products and Services capture how a company manages the environmental and social impacts stemming from its products and services, from design choices to disposal, addressing both inherent risks (e.g. tobacco) and those created by use (e.g. packaging waste). Heightened sustainability regulations and surging consumer demand for eco-friendly offerings create a double-edged sword for businesses. Non-compliance with regulations can incur significant fines and reputational damage, while neglecting the consumer shift can threaten market share and long-term viability. E&S Impact of Products and Services risks are driven mainly by the regulatory environment, the level of consumer demand for sustainable products and services, and the choices made at the design stage regarding product or service life cycle impact (use, materials, disposal).

MEI.12 Human Rights	Human Rights encompasses a company's management of and respect for fundamental human rights within its own operations and includes proactive measures to prevent, mitigate and remediate adverse human rights impacts. Human rights, which include civil and political rights, economic, social and cultural rights, and child and forced labor, has been a long-standing issue for companies across all industries. Stringent regulations are increasingly being implemented worldwide, mandating companies to actively address these issues. Companies that fail to demonstrate ethical operations and respect for human rights throughout their business practices can risk erosion of their market share, encounter talent acquisition struggles, and face increased scrutiny from investors, consumers, civil society and other crucial stakeholders. Factors such as a company's operating environment (e.g. weak labor laws) and the nature of the work (e.g. manual labor) significantly influence the risk of human rights violations.
MEI.12.SC Human Rights – Supply Chain	Human Rights – Supply Chain encompasses a company's management of fundamental human rights issues occurring within its supply chain and includes proactive measures to prevent, mitigate and remediate adverse human rights impacts. The issue emphasizes the measures taken by a company to respect civil and political rights as well as economic, social, and cultural rights, including freedom from child and forced labor within its supply chain. While companies tend to have less control of second and lower tier suppliers, stricter regulations and consumer demand are prompting firms to be more accountable for and transparent about their supply chains. The primary drivers of human rights risks within a company's supply chain stem from the chain's structure and geographic reach, alongside the nature of the outsourced work.
MEI.13 Human Capital	Human Capital encompasses a company's management of its human resources, from acquiring and retaining top talent, to providing advancement opportunities in a diverse and equal work environment and adopting an inclusionary corporate culture. It also captures a company's management of its labor relations, including upholding freedom of association and non-discrimination practices, alongside adherence to working hours and minimum wage regulations. Effective Human Capital management safeguards companies against legal ramifications stemming from employee rights violations, mitigate financial losses due to demotivation and decreased productivity, and prevents operational disruptions caused by a disengaged workforce. Human Capital risk is driven primarily by a company's labor structure, which is based on its labor and skill intensity, the propensity for work stoppages and level of diversity within the workforce.
MEI.14 Land Use and Biodiversity	Land Use and Biodiversity focus on how a company manages land use in its own operations and how it minimizes potentially adverse impacts of that use on the functioning of ecosystems and biodiversity. The impact humans and businesses have had on natural capital is reaching unprecedented and unsustainable levels. Companies rely on the use of land, on the availability of natural resources, and on the functioning of ecosystems to continuously provide those resources as inputs in their operations. If natural systems fail or become unstable, companies' ability to depend on land and natural resources regularly and at stable prices can be jeopardized, potentially leading to business disruptions, as well as operational, legal, regulatory, and financial risks. Land Use and Biodiversity risks are driven by a company's type of business and how heavily it relies on land, wildlife, and natural ecosystems.
MEI.14.SC Land Use and Biodiversity – Supply Chain	Land Use and Biodiversity – Supply Chain focuses on how a company handles relationships with its suppliers regarding their management of land use and the potentially adverse impacts of that use on the functioning of ecosystems and biodiversity. Many companies rely on their suppliers to provide them with goods and services derived from land use, which depend on the availability of natural resources and the functioning of ecosystems to continuously supply these resources as inputs into their value chain. If these systems fail or become unstable, companies may face greater volatility in their supply chains as the physical availability or price stability of these inputs is jeopardized, potentially leading to business disruptions. Land Use and Biodiversity – Supply Chain risks are driven by a company's type of business and how heavily it relies on land, wildlife and natural ecosystems as inputs in its supply chain. Even industries whose operations do not directly use land or rely on wildlife may face such risks in their supply chain if their suppliers' operations do.
MEI.16 Occupational Health and Safety	Occupational Health and Safety refer to a company's ability to ensure its workforce is safe and healthy and to mitigate the risk of occupational hazards such as employee injuries or fatalities. A company's

	workforce is often its greatest asset. Investing in workforce health and safety can help mitigate the risk of workplace accidents and fatalities and their associated operational costs, delays and stoppages, as well as potential regulatory and legal risks. At the same time, a positive record on workforce safety may help a company position itself as an attractive employer, particularly in industries that require specific skillsets or face workforce shortages. Occupational Health and Safety risks are typically higher in industries with a higher prevalence of health hazards, as indicated by fatality and injury rates.
MEI.17 ESG Integration – Financials	ESG Integration – Financials covers the integration of environmental, social and governance criteria into financial and real estate decision-making as investors aim to lower their risk, maximize returns, and find profitable investment opportunities. Companies that structurally ignore ESG risks in their investing and financing decisions, such as those associated with climate change, human rights violations, or weak corporate governance, may face a multitude of adverse consequences. These include the risk of assets becoming stranded or losing their value in the wake of physical or transition risks, resulting in financial losses and missed opportunities. Additionally, greenwashing claims expose companies to legal, financial, and reputational risks. ESG Integration risk is primarily driven by two factors: the characteristics of a company's portfolio or assets, and the evolving regulatory and enforcement landscape surrounding ESG issues.
MEI.18 Product Governance	Product Governance encompasses a company's management of the entire lifecycle of its products and services to prevent and mitigate risks and consequences for its customers and end users. Customers have certain expectations about the quality and usability of the products and services they purchase. If companies do not adequately manage the product development lifecycle, and this leads to low quality products, product malfunctions, or products and services that are not suitable or fit for customers' intended purposes, companies can face various negative repercussions. Product Governance risks can manifest across four key domains: product and service characteristics, operational environment, product and service impacts, and marketing and communication.
MEI.19 Resilience	Resilience focuses on the ability of financial institutions to withstand negative shocks arising from changes in economic conditions. It measures financial stability and the management of related risks with an emphasis on capital requirements. Following the financial crisis in 2008, the interconnectedness of financial institutions became apparent, to the extent that the failure of one bank could trigger financially distressed conditions in general, and even the failure of another bank. Since that period, regulators globally have instituted enhanced reporting and capital requirements to reduce the likelihood of similar systemic financial crises occurring again. Banks that have more concentrated portfolios, whether in terms of their sector, geography, or on a specific product or service, may be more likely to face shocks if there are sudden changes in the market environment.
MEI.21 Water Use - Own Operations	Water Use – Own Operations focuses on how a company directly uses water in its production and operations, and how it manages contextual, localized water risks that could affect other water users in the same watershed, especially at sites most at risk. Exacerbating freshwater scarcity presents a material risk to operational continuity. Companies may face production disruptions, rising water costs, necessary investments in water treatment systems, and regulatory fines for exceeding water usage allowances. To navigate this growing challenge and ensure long-term profitability, sustainable water management strategies are essential. Risks associated with water use arise from a company's operational dependence on water for the production of goods or services, the geographical availability of water, and competing demands for water as a shared resource.
MEI.21.SC Water Use - Supply Chain	Water Use – Supply Chain focuses on how effectively a company incorporates and manages water-related risks within its supply chain. Exacerbating freshwater scarcity presents a material risk to operational continuity. Companies may face production disruptions at their suppliers' facilities, leading to shortages of materials or finished goods for their own production. Additionally rising water-related costs across the value chain may have an impact on companies' bottom line. Risks relating to the use of water in the supply chain arise from suppliers' operational dependence on water for the production of materials or finished products, the geographical availability of water at suppliers' operating sites and competing demands for water as a shared resource.
MEI.22 Raw Material Use	Raw Materials Use encompasses a company's management of raw material inputs (excluding energy and petroleum-based products) in the production process. It includes the selection, use and efficiency

	of raw material inputs. It focuses on measures taken to ensure long-term profitability amid increased raw material demand and supply challenges, as the low-carbon transition is expected to drive exponential growth in demand for a number of critical raw materials. A company's sustainable raw materials management strategy is key to navigating this growing challenge. Raw Material Use risks are primarily determined by a company's required raw material inputs and the nature of its activities. Raw materials can face higher risk based on three main aspects: physical scarcity, unequal endowment of raw materials across countries paired with geopolitical risk, and structural excess demand intensity.

Glossary of Terms

Definitions of key terms or acronyms used in the methodology and the product.

Baseline Issues	Refers to Corporate Governance and Stakeholder Governance as the foundational block in the ESG Risk Ratings.
Beta	Assesses the degree to which a company's exposure deviates from its subindustry exposure. For companies in the Comprehensive Framework, betas are set at the issue level (see Issue Beta). For Core companies, they are set at the overall level (see Overall Beta).
Beta Activation Matrix	Technical representation of the selection or set of Beta Indicators per subindustry and issue, using binary values {1, 0} with 1 indicating the indicator is selected and 0 it is not selected. A Beta indicator may be applied to any issue for which it is considered relevant and may therefore appear across multiple material ESG issues.
Beta Component	The five main thematic areas that Sustainalytics considers when adjusting a company's Exposure to material ESG issues by using Betas: Product & Production, Financials, Risk Events, Geographic, and Governance. The sum of Beta Signals that belong to a beta component is called component outcome (or score). Beta components provide just another layer of analysis, but do not play any specific role in scoring.
Beta Indicator	Beta indicators provide a systematic and consistent assessment of clearly delineated and standardized criteria at individual company level. Beta indicators comprise a set of Outcome Categories with the outcome of the assessment forming the Beta Signal. Forms the lowest level of defined scoring within the Exposure dimension of the ESG Risk Ratings.
Beta Signal	Provides the outcome (score) of the associated Beta Indicator that typically ranges between -1 and +1. The scoring algorithm applied to a beta indicator (and therefore the beta signal) can be MEI- and subindustry-specific. Individual beta signals add up and, together with the qualitative overlay, the subindustry correction factor, the beta default value of 1 form the final Issue Beta.
Category	Refers to Risk Event Indicator Category.
Cluster	Refers to E/S/G Cluster.
Comprehensive Framework (Comprehensive)	The research framework that forms the methodological foundation of the ESG Risk Ratings. It comprises all features, is very granular in nature, and provides additional qualitative analyst insights. The related Scoring Model is called Comprehensive Model.
Comprehensive Model	Quantitative Scoring Model that describes how the scores are aggregated to form the final ESG Risk Ratings result for companies in the Comprehensive Framework.
Constant	A constant value that is used in the Core Model. It is added to the management scores to improve the predictive power of the Core model and represents the contribution to the management score that would be expected from indicators that are not in the Core Framework's focused indicator set but are used in the Comprehensive Framework.
Core Framework (Core)	A simplified research framework that has been created to extend the coverage universe of the ESG Risk Ratings. It is derived from the full ESG Risk Ratings model and uses a reduced indicator set and structure to approximate the Comprehensive Framework's outcomes. The related Scoring Model is called Core Model.
Core Model	A quantitative scoring model that describes how the scores are aggregated to form the final ESG Risk Ratings result for companies in the Core Framework.
Disclosure & Compliance Indicators	A type of Management Indicator that assesses both the extent to which a company reports information on its ESG risks and impacts, practices, and performance, and the degree to which it aligns with relevant external standards, norms, or voluntary frameworks. This category captures a company's willingness to provide stakeholders with clear, comparable information and its adherence to internationally recognized best practices

E/S/G Cluster	Structural element that allows to analyze and report on results from the ESG Risk Ratings referring to 'E' (Environment), 'S' (Social) or 'G' (Governance) separately. E/S/G cluster scores are only available for companies in the Comprehensive Framework.
E/S/G Cluster Score	Refers to the Unmanaged Risk of the respective E/S/G cluster. It is expressed as a score that is calculated by summing up shares of Issue Unmanaged Risk scores. These shares are derived from the aggregated weight of management and Risk Event Indicators that speak to the respective E, S, or G cluster within those issues. Note: The Overall Unmanaged Risk score calculated by adding up the cluster unmanaged risk scores is equivalent to the overall unmanaged risk score that is calculated adding up MEI level scores.
ESG Risk Categories at Issue Level	A company's ESG Risk Ratings score on the issue Level is assigned to one of five ESG risk categories in the ESG Risk Ratings: Negligible risk (issue unmanaged risk score between 0 and 1.99 points): This material ESG Issue is considered to drive negligible risk to enterprise value. Low risk (issue unmanaged risk score between 2 and 3.99 points): This material ESG Issue is considered to drive low risk to enterprise value. Medium risk (issue unmanaged risk between 4 and 5.99 points): This material ESG Issue is considered to drive medium risk to enterprise value. High risk (issue unmanaged risk between 6 and 7.99 points): This material ESG Issue is considered to drive high risk to enterprise value. Severe risk (issue unmanaged risk 8 points or above): This material ESG Issue is considered to drive severe risk to enterprise value. Note: Because ESG risks materialize at an unknown time in the future and depend on a variety of unpredictable conditions, no predictions on financial or share price impacts, or on the time horizon of such impacts, are intended or implied by these risk categories.
ESG Risk Categories at Overall Level	A company's ESG Risk Ratings score on Overall Level is assigned to one of five ESG risk categories in the ESG Risk Ratings: Negligible risk (overall unmanaged risk score between 0 and 9.99 points): ESG factors are considered to drive negligible risk to enterprise value. Visually, it is represented by 5 globes. Low risk (overall unmanaged risk score between 10 and 19.99 points): ESG factors are considered to drive low risk to enterprise value. Visually represented by 4 globes. Medium risk (overall unmanaged risk score between 20 and 29.99 points): ESG factors are considered to drive medium risk to enterprise value. Visually represented by 3 globes. High risk (overall unmanaged risk score between 30 and 39.99 points): ESG factors are considered to drive high risk to enterprise value. Visually represented by 2 globes. Severe risk (overall unmanaged risk score 40 points and above): ESG factors are considered to drive severe risk to enterprise value. Visually represented by 1 globe. Note: Because ESG risks materialize at an unknown time in the future and depend on a variety of unpredictable conditions, no predictions on financial or share price impacts, or on the time horizon of such impacts, are intended or implied by these risk categories.
Morningstar Sustainalytics' ESG Risk Ratings	Morningstar Sustainalytics' rating framework that measures the extent to which enterprise value is at risk, driven by environmental, social and governance (ESG) factors. The rating takes a two-dimensional approach. The exposure dimension measures a company's exposure to ESG risks, while the management dimension assesses a company's handling of these ESG risks. A company's ESG Risk Ratings applies the concept of Risk Decomposition to derive the level of Unmanaged Risk for a company and is comprised of a quantitative score and a related ESG Risk Category on Overall Level. The quantitative score represents units of unmanaged ESG risk with lower scores representing less unmanaged risk. Unmanaged Risk is measured on an open-ended scale starting at zero (no risk) and, for 95% of cases, a maximum score below 50. It is calculated as the difference between a company's overall Exposure score and its overall Managed Risk score. For companies in the Comprehensive Framework, it can alternatively be calculated summing up the company's Issue Unmanaged Risk scores.

ESG Risk Ratings Review (ESG RR Review)	An annual review of the subindustry level assessments and model components of the ESG Risk Ratings to ensure that the ratings reflect the dynamics in the underlying macro-factors, which drive the significance of exposure to material ESG issues on enterprise value. Typically, these factors are socio-economic, geopolitical or technology-driven in nature and include hard aspects (e.g. changes in regulation) and soft ones (e.g. shifts in societal perception and political sentiment).
ESG Risk Score	Refers to ESG Risk Ratings score.
Exceptional Event Adjustment	A special Beta Indicator that has been designed to reflect the additional order of magnitude in exposure that is implied by the occurrence of category 4 or 5 risk events to reflect the exceptionality of these events. According to the scoring algorithm, a risk event category 4 triggers an increase of exposure of 1 score or (at least) to a level of 6, a risk event category 5 triggers an increase of exposure of 2 scores or (at least) to a level of 8.
Exposure – ESG Risk	An assessment dimension that reflects the extent to which a company is sensitive to material ESG risks.
Idiosyncratic Issue	An issue that was not deemed material at the subindustry level but becomes a Material ESG Issue for a company based on the occurrence of a Category 3, 4 or 5 risk events. In the Comprehensive Framework, Idiosyncratic issues are represented only by the respective risk event indicator and receive an exposure score according to a specific predetermined scheme. In the Core Framework, Idiosyncratic Issues are represented by a Beta Indicator and Risk Event Indicator.
Incident	Incident represents a singular negative issue that a company is involved in.
Indicator Score (Indicator Raw Score, Raw Score)	The score that corresponds to the respective Outcome Category selected by the analyst during indicator research and applies to different types of indicators, e.g. Management Indicators, Event Indicators and Beta Indicators.
Issue Beta (Beta, β)	A factor that assesses the degree to which a company's exposure deviates from its subindustry's exposure on a material ESG issue. It is used to derive a company-specific Issue Exposure score for a material ESG issue. It ranges from 0 to 10, with 0 indicating no exposure, 1 indicating the subindustry average (as represented by the subindustry exposure score), and 2 indicating exposure that is twice the subindustry average. Betas above 2 are extreme cases and very rare. The Beta is calculated as the sum of beta signals, qualitative overlay, and subindustry correction factor plus the beta default value of 1.
Issue Disabling (MEI Disabling)	Part of the regular update of a company assessment where the analyst exercises professional judgement to decide if the issue is applicable to a company or if it should be disabled (technically equal to setting an Issue Beta to 0).
Issue Exposure Score – ESG Risk	A numerical value that represents the extent to which a company is sensitive to a single material ESG issue. It is displayed on an open-ended scale starting at 0. Zero indicates that the issue is not material to the company, while values of 8 and above indicate highly material issues.
Issue Manageable Risk	Refers to the part of Issue Exposure that can potentially be influenced and managed by a company through suitable policies, programs and initiatives. It is determined by the Issue Manageable Risk Factor and expressed as a score ranging between 0 (indicating no manageable risk) and the issue exposure score.
Issue Manageable Risk Factor (MRF)	A factor that assesses how much of a company's Issue Exposure is (theoretically) manageable by the company. The issue manageable risk factor is predetermined at the subindustry level. The factor ranges between 0% and 100%, with a low percentage indicating that a high level of the issue risk is considered unmanageable and 100% indicating that the issue risk is considered fully manageable. Note: Fully manageable does not mean that Sustainalytics believes there are no challenges or difficulties to managing the issue – rather, fully manageable indicates that there are no evident physical or structural barriers that make it impossible to fully manage the issue.
Issue Managed Risk	Refers to the part of the Issue Manageable Risk that the company has demonstrated to manage through suitable policies and programs or initiatives as determined by the Issue Management and expressed as a score that ranges between 0 and the manageable risk score.

Issue Management (Management, Management Score)	Measures a company's handling of a single material ESG issue and is used to calculate the Issue Managed Risk. It is expressed as a score that is calculated as the sum of all indicators weighted scores in an issue and ranges from 0 to 100, with 0 indicating no (evidence of) management of the issue and 100 very strong management of the issue.
Issue Management Gap	The difference between what the company has managed through suitable policies and programs or initiatives (Issue Managed Risk) and what is (theoretically) possible for the company to manage (Issue Manageable Risk).
Issue Management Weight	To arrive at the Overall Management score, we must weigh each Issue Management score by the issue management weight. The issue management weight is calculated by dividing the Issue Manageable Risk score by the Overall Manageable Risk score.
Issue Unmanageable Risk	Referring to the amount of issue exposure that is deemed "unmanageable" and which cannot be mitigated by the company through management initiatives, it is expressed as a score that's calculated by subtracting the Issue Manageable Risk score from the Issue Exposure score. The score ranges from 0 to the issue exposure score, with 0 indicating that the issue risk is fully manageable, and a score equaling the issue exposure score indicating that none of the issue risk is manageable.
Issue Unmanaged Risk	The portion of the issue exposure that a company either cannot manage (because it is unmanageable) or has not yet addressed through management initiatives (as demonstrated in relevant policies and programs and proven track record). It is expressed as a score that's calculated by subtracting the Issue Managed Risk score from the Issue Exposure score and ranges from 0 (indicating no unmanaged risk) to the issue exposure score.
Manageable Risk	Refers to Issue Manageable Risk and Overall Manageable Risk.
Manageable Risk Factor	Refers to Issue Manageable Risk Factor and Overall Manageable Risk Factor.
Managed Risk	Refers to Issue Managed Risk and Overall Managed Risk.
Management	One of the two dimensions of the ESG Risk Ratings, this dimension measures a company's handling of Material ESG Issues through policies, programs, quantitative performance, and involvement in controversies, as well as its management of Corporate Governance. Its outcome is expressed in the Overall Management score. Also used as short form for Issue Management score.
Management Gap	Refers to Issue Management Gap and Overall Management Gap.
Management Indicator	An indicator that provides a signal about how effectively a company is managing (a part of) its exposure to a material ESG issue through policies, programs, or quantitative performance, for example. Management indicators comprise a set of Outcome Categories with one being selected to determine the final Indicator Score. The score ranges between 0 (indicating no management) and 100 (indicating best practice). Together with the Risk Event Indicators, management indicators are used to form the Management score of a company.
Management Indicator Disabling	Part of the regular update of a company assessment where the analyst exercises professional judgment to decide if the management indicator is applicable to a company or if it should be disabled. A feature only active in the Comprehensive Framework.
Material ESG Issues	A core building block of the ESG Risk Ratings. An ESG issue is considered to be material within the rating if it is likely to have a significant effect on the enterprise value of a typical company within a given subindustry and its presence or absence in financial reporting is likely to influence the decisions made by a reasonable investor. Material ESG issues were determined at a subindustry level through a structured consultation process with analysts but can be disabled for a company if the issue is not relevant to the company's business. Note: There are no specific predictions about financial impacts at the company level implied by the presence or absence of an issue as a material ESG issue.
Outcome Category	Refers to one out of several possible indicator outcomes. Sustainalytics indicators provide a systematic and consistent assessment of clearly delineated and standardized criteria at individual company level that are assessed by the analysts. The outcome category consists of a standardized text and an outcome

	score. For management indicator and Risk Event Indicators, that score that is mapped to the finally selected outcome category is also called Indicator Score, for beta indicators it forms the Beta Signal.
Overall Beta	A factor that assesses the degree to which a company's overall exposure deviates from its subindustry's overall exposure. For companies in the Comprehensive Framework, it is calculated by dividing the company's Overall Exposure by the Overall Subindustry Exposure. For Core companies, it is calculated by summing up the beta signals, the Qualitative Overlay and the Subindustry Correction Factor plus the default beta value of 1.
Overall Exposure Score – ESG Risk	A numerical value that represents the extent to which a company is sensitive to material ESG risks. It is displayed on an open-ended scale starting at 0. Zero indicates no exposure, while values of 40 and above indicate high exposure. For companies in Sustainalytics' Comprehensive Framework, the score is calculated by summing up the Issue Exposure Scores (including any Idiosyncratic Issues or Systemic ESG Issues). For companies in the Core Framework, the score is calculated by multiplying the Overall Subindustry Exposure Score with the Overall Beta for the company.
Overall Manageable Risk	Refers to the material ESG risk that can be influenced and managed through suitable policies, programs and initiatives. It is expressed as a score that is calculated by multiplying the Overall Exposure score by the Overall Manageable Risk Factor. For companies in Comprehensive Framework, it can also be calculated as the sum of the manageable risks at the issue level. The score ranges from 0 to the company's overall exposure score with 0 indicating that no risk is manageable and the score equaling the company's overall exposure score indicating that the company's exposure is fully manageable.
Overall Manageable Risk Factor (Overall MRF)	Referring to the overall percentage of risk that can be managed by a company. It is calculated as a weighted average of the Issue Manageable Risk Factors, or alternatively by dividing the Overall Manageable Risk score by the Overall Exposure score. The Overall MRF ranges between 0% and 100%, with a low percentage indicating that a high level of material ESG risks is considered unmanageable and 100%, indicating that these risks are considered fully manageable.
Overall Managed Risk	Refers to material ESG risk that has been managed by the company through suitable policies, programs, or initiatives. It is calculated by multiplying the Overall Manageable Risk score by the Overall Management score and dividing by 100, or alternatively by subtracting the Overall Unmanageable Risk score and the Management Gap score from the Exposure score. For Comprehensive companies, it can also be calculated by summing up of the company's Issue Managed Risk scores. The score ranges from 0 to a company's overall exposure score, with 0 indicating that none of the company's ESG risks have been managed, and a score equal to the company's exposure score indicating that the company's ESG risks are fully managed.
Overall Management	Relates to the management dimension and measures a company's handling of ESG risks across issues. It is expressed as a score that ranges from 0 to 100, with 0 indicating no (evidence of) management and 100 very strong management. For Comprehensive companies, it is calculated by summing up all weighted Issue Management scores (see also Issue Management Weight). For Core companies, it is calculated as weighted sum of the Indicator Raw Scores (including management and Risk Event Indicators) plus the Constant.
Overall Management Gap	Represents the total amount of risk which the company could be managing but which it is not yet managing. It is expressed as a score that is calculated by subtracting the Overall Managed Risk score from the Overall Manageable Risk score. The score ranges from 0 to a company's overall manageable risk score, with 0 indicating that all of a company's manageable risk has been managed, and a score equaling a company's overall manageable risk score indicating that none of the company's manageable risk has been managed.
Overall Subindustry Exposure Score – ESG Risk	A numerical value that represents the extent to which a subindustry is sensitive to all its material ESG issues. It is calculated by summing up the Subindustry Issue Exposure scores. The score can be used to represent a company's overall exposure to material ESG issues in its respective subindustry.
Overall Unmanageable Risk	Refers to material ESG risk inherent from the intrinsic nature of products or services of a company and/or the nature of a company's business, which cannot be managed by the company if the company continues to offer the same type of products or services and remains in the same line of business. It is expressed as a score and calculated by subtracting the Overall Manageable Risk score from the Overall Exposure score. For Comprehensive companies, alternatively, it is derived by summing up the company's

	issue unmanageable risk scores. The score ranges from 0 to the overall exposure score of the company, with 0 indicating that all of the company's ESG risks are fully manageable and a score equal to overall exposure indicating that no ESG risks are manageable.
Overall Unmanaged Risk (ESG Risk)	Refers to a company's overall score in the ESG Risk Ratings that measures the extent to which enterprise value is at risk driven by ESG factors. It is assessed as that part of exposure that a company does not manage based on available information regarding policies, programs, quantitative performance, and risk event track record. The overall unmanaged risk score is measured on an open-ended scale starting at zero (no risk) and, for 95% of cases, a maximum score below 50.
Policy Indicators	A type of Management Indicator that measures the strength and quality of an issuer's policy commitment to addressing a material ESG issue.
Programme & Management Systems Indicators	A type of Management Indicator that evaluates a company's operational systems for managing its material ESG issues. These indicators are aligned with and reflective of recognized management systems, such as the ISO 9001 quality standard or the ISO 14001 environmental management standard.
Qualitative Overlay	A special Beta Indicator that is optional and applied by an analyst to arrive at the final Issue Beta for a company. Potential reasons for qualitative overlay include, for example, (1) situations in which company-specific factors are not reflected in the beta signals or (2) situations in which the beta signals, either individually or collectively, do not yet reflect recent developments (e.g. M&A activity). Overlays can be done at the MEI-level only, not at the overall level. Analysts must provide a written rationale to explain their overlay.
(Quantitative) Performance Indicators	A type of Management Indicator that measures the effectiveness of policies, programs and management systems and are tracked yearly to show a trend over time.
Risk Decomposition	Describes the logic that distinguishes different types of risk that contribute to Exposure to derive Unmanaged Risk scores and is applied on the overall level (Comprehensive and Core model) as well as on the issue level (Comprehensive model only). The ESG Risk Ratings differentiate Unmanageable Risks, which cannot be addressed through company initiatives, from Manageable Risks, which can be addressed. Manageable risks are assessed as either managed by companies through suitable policies and programs, etc. (Managed Risk), or as not managed by companies (Management Gap). Unmanageable risk and management gap can be added up to arrive at the unmanaged risk of a company at the issue- or overall level.
Risk Event	The aggregation of controversy-driven risk across all incident chains associated with the same event indicator.
Risk Events Weight Shift	The dilution mechanism of Management Indicators that is applied in the Management dimension of the ESG Risk Ratings and triggered by Risk Events. This is accomplished by assigning a raw score of 0 to each risk event (independent of its category) and combining it with a weight that depends on the Risk Event Category. The weight of the risk event in the scoring algorithm increases as the severity increases, acting as a discount to the other management indicators. The aggregated weight of all risk events for a company is capped at 90%.
Standard Ratings Plus Universe	Refers to the coverage universe of the ESG Risk Ratings to which the Comprehensive or the Core Framework is applied to.
Scoring Model	Refers to the quantitative model behind a rating. The scoring model uses a scoring algorithm that combines indicator scores and model parameters (such as indicator weights) to arrive at the final rating outcome. For the ESG Risk Ratings, we distinguish between the Comprehensive Model that's applied for companies in the Comprehensive Framework and the Core Model that is used for companies in the Core Framework.
Subindustry Correction Factor (SCF)	A technical correction factor that is applied to assure that the average Issue Beta within a subindustry is one.
Subindustry Exposure – ESG Risk (Subindustry Exposure Score)	Refers to Issue Subindustry Issue Exposure Score – ESG Risk and Overall Subindustry Exposure Score – ESG Risk.
Subindustry Issue Exposure Score – ESG Risk	A numerical value that represents the extent to which a subindustry is sensitive to a single material ESG issue. The score ranges from 2 to 10, with 2 indicating a low level of exposure and 10 indicating a high level of exposure.

Sustainalytics Subindustry (Subindustry)	Sustainalytics subindustries are defined as part of Morningstar Sustainalytics' own classification system; the number of subindustries in the Sustainalytics subindustry classification system is 135.
Systemic ESG Issue	A Systemic ESG Issue represents the issue which arises by a Systemic Event considered material for a set of companies. The systemic ESG issue materializes with a Systemic Event Indicator assessment of category 4 or category 5.
Systemic Event	A 'sea change' event that is somehow unpredictable in nature and that is affecting larger groups of companies at the same time and across a multitude of ESG issues. Contrary to 'conventional' events that may imply idiosyncratic issues, systemic events are not driven by any company action, and their management is (almost) completely out of a company's control.
Systemic Event Indicator (SEI)	An event indicator that provides a signal about the severity of the Systemic Event for a company with regards to its exposure to (systemic) ESG risks. A category 4 or category 5 systemic event materializes as a Systemic ESG Issue in the ESG Risk Ratings.
Unmanageable Risk	Refers to Issue Unmanageable Risk and Overall Unmanageable Risk.
Unmanaged Risk	Refers to Issue Unmanaged Risk and Overall Unmanaged Risk.

Endnotes

[1] Text that is highlighted in bold grey indicates a term that is explained in the Glossary of Terms in the Appendix.

[2] For more information on the our universe definitions, please refer to the "Universe Coverage Information" document in the Morningstar Sustainalytics' Knowledge Base platform (only available to clients).

[3] Garz, Karoui, Pop, Flaherty (2022), "Systemic Events in the ESG Risk Ratings".

[4] Factual feedback to address any potential errors can be communicated by contacting the Issuer Relations & Investor Support Team at issuer.relations@morningstar.com.

Change Log

Version	Iteration	Effective Date	Approval	Description	Rationale
1.0	1	September 2018	ESG Research & Methodology, ESG Products	Methodology launched.	-
2.0	1	January 2020	ESG Research & Methodology, ESG Products	▸ Implementation of the new Exposure framework. ▸ Implementation of E/S/G Cluster Ratings.	▸ Improving the exposure assessment and increasing the rating's transparency by displaying the underlying beta indicators to analysts and clients. ▸ Increasing the transparency on risks driven by environmental, social and governance factors, separately.
2.0 (formerly 2.1)	2	January 2021	ESG Research & Methodology, ESG Products	▸ Update in section related to the ESG Risk Rating Review. ▸ No change in ESG Risk Ratings model.	▸ Increasing transparency on the methodological revision process.
3.0	1	April 2024	ESG Research & Methodology	▸ Implementation of the new Corporate Governance & Stakeholder Governance methodology. ▸ Implementation of new Material ESG Issues (MEIs): Water-Own Operations, Water Use-Supply Chain and Raw Material Use, Removal of the following MEIs: Resource Use, Resource Use-Supply Chain and Bribery and Corruption. The issues captured by the retired MEIs are covered by existing or new MEIs. ▸ Implementation of Systemic ESG Issue, Systemic Events and Systemic Event Indicator.	▸ Aligning the assessment of the Corporate Governance pillar with the other Material ESG Issues. ▸ Enhancing the assessment of issues related to water and scarce raw materials. ▸ Start capturing unpredictable events that affects large sets of companies at the same time and across a multitude of ESG issues. Triggered by the conflict in Ukraine.
3.0 (formerly 3.1)	2	June 2024	ESG Research & Methodology	▸ Created a new section on Data Sources and Quality Assurance. No change in ESG Risk Ratings model.	▸ Increase transparency on data inputs and processes.
3.0 (formerly 3.1.1)	3	December 2024	ESG Research & Methodology	▸ Updated section on Data Sources and Quality Assurance. No change in ESG Risk Ratings model.	▸ Compliance with UK Code of Conduct.
3.1 (formerly 3.2)	1	September 2025	ESG Research & Methodology	▸ Implementation of the new Events framework: Replacement of Event indicators by Risk Event indicators; Removal of score impact from Category 1 and 2 Events; Consideration of Category 3 Risk Events as triggers for Idiosyncratic Issues. ▸ Those changes resulted in a minor decrease in scores, with limited number of high delta cases.	▸ Increasing the ESG Risk Ratings focus on financially material events.

3.1	2	April 2026	Methodology Review Group	▶ Restructured existing text. ▶ Provided more detailed information on considerations applied in the creation of the methodology (Methodology Context), data sources and methodology revisions. ▶ Newly added sections: Methodological Approach; Scope & Limitations; Methodology Context; Categories; Benchmarking; Data Sources; Research Approach; Engagement; Governance, Review and Market Consultation; Revisions.	▶ Compliance with Regulation EU 2024/3005.
3.1	3	July 2026	Methodology Review Group	▶ Restructured existing text. ▶ Newly added section: Enhanced Research.	▶ Expanding the scope of the Comprehensive framework.

About Morningstar Sustainalytics

Morningstar Sustainalytics is a leading ESG research, ratings, and data firm that supports investors around the world with the development and implementation of responsible investment strategies. For 30 years, the firm has been at the forefront of developing high-quality, innovative solutions to meet the evolving needs of global investors. Today, Morningstar Sustainalytics works with hundreds of the world's leading asset managers and pension funds who incorporate ESG and corporate governance information and assessments into their investment processes. The firm also works with hundreds of companies and their financial intermediaries to help them consider ESG Risk in policies, practices, and capital projects. For more information, visit www.sustainalytics.com.