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« Corporate Climate Ratings :

Assessing Divergence from Scientific Expectations »

by

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Corporate climate ratings:
Assessing divergence from scientific expectations

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Abstract

Private investment and consumption choices serve as a major driver to push companies to cut their greenhouse gas emissions and prepare for climate change. Sustainability scores, labels and rankings have helped guide these decisions since the 1990s, but are now coming under increasing scholarly criticism. In this context, we performed a systematic review of this criticism and tested the findings against current climate performance assessment tools. Our approach includes a comprehensive literature review, an inventory of climate-related scores, labels and ranking providers and their offerings, and an assessment of scores against best-in-class practices for each issue. We find the concerns raised in the scientific literature are related to the accuracy, reliability, and fairness of the tools, and whether they are effective in driving corporate action. Tool providers were found to use a diversity of business models, methodologies, and definitions of corporate climate performance. Despite some variability across tools and concerns, we find tools remain generally opaque and poorly aligned with scientific expectations. While corporate climate performance systems typically address indirect impacts and industry and size specificities; they rarely use standardized, verified inputs, and transparent, science-based weightings. Investors, corporations, and researchers can use our results to inform their choice of information providers, and regulators might take interest in the snapshot we provide on the maturity of the corporate climate performance measurement market. This paper aims to initiate improvements in the design of sustainability information systems.

Keywords: rating; score; label; climate; corporate; ESG; CSR

Highlights:

- Climate scores can lack accuracy, reliability, fairness, and impact.
- Varying definitions of climate performance result in diverse methods and perimeters.
- Scoring systems remain relatively opaque, leading to information asymmetry.
- Despite exceptions, climate scores generally misalign with academic concerns.
- Standardized, verified inputs and transparent, science-based weightings remain rare.

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1   Introduction

Global warming causes major damage to ecosystems and threatens human lives and livelihoods (Calvin et al., 2023). Climate change is increasingly attracting public scrutiny (Leiserowitz et al., 2018; Poortinga et al., 2011), in a context where 2024 was the first year to exceed 1.5°C of average global warming and global governance struggling to make headway (Calvin et al., 2023; European Commission and Copernicus and ECMWF, 2025).

In the absence of sufficient constraining regulation (Schneider and La Hoz Theuer, 2019), companies are increasingly under end-user, corporate consumer and investor pressure to manage their contribution to global warming (Alkhatib et al., 2023; Beisenbina et al., 2023). In response, corporations are disclosing an increasing amount of information and performance indicators on greenhouse gas (GHG) emissions linked to their activities (Kolk et al., 2008) either through their corporate social responsibility (CSR) reports or through voluntary reporting platforms such as the Carbon Disclosure Project (CDP) (CDP, 2024a). Even though most climate reporting is still essentially voluntary, both the EU and the US extend have recently brought in regulations that extend the perimeter and frequency of mandatory reporting. (European Commission, 2024; U.S. Securities and Exchange Commission, 2024).

However, the literature has shown that reported data points and information disclosed are unreliable. For instance, company disclosures often either vary across sources, are only partial, or are computed using different approaches and perimeters (Brander and Bjørn, 2023; Brander et al., 2023; Dragomir, 2012; Klaaßen and Stoll, 2021; Magnusson Rauf, 2023; Matthews et al., 2008), which generates strong information asymmetry. Furthermore, reported information can be extensive and can carry significant positive bias (Bingler et al., 2022). This contributes to high information processing costs, and stakeholders may be exposed to information fatigue or lack the knowledge necessary to interpret the disclosed data (Brown et al., 2009).

Stakeholders' struggles with decision-making have led to the development of scoring systems designed to evaluate and aggregate the available data. Companies can also voluntarily commission these evaluations to attract further investment or customers (Avetisyan and Hockerts, 2017; Mooij, 2017). First to capture the market were financial information providers (e.g. KLD, MSCI), closely followed in the 1990s and 2000s by new companies specializing in environmental, social and governance (ESG) data analysis and ratings (e.g. Vigeo, EIRIS) (Avetisyan and Hockerts, 2017). Since the 2000s, the market has largely consolidated (Avetisyan and Hockerts, 2017; Escrig-Olmedo et al., 2019) but there are still a number of competing ESG scoring systems around today. These organizations study public ESG data from companies to extract data points and aggregate their findings in databases of ESG performance indicators, which they ultimately roll up into certifications, labels, rankings, scores and ratings. For purposes of simplicity, here we will use the terms 'score' and 'scoring' to refer to any of these outputs, and the term 'rater' or 'actor' to refer to any score provider.

ESG scores are now widely used in finance, procurement and research as a measure of corporate social responsibility, and, more specifically, of corporate climate performance (Chatterji et al., 2016). However, these ESG ratings have been repeatedly challenged in the critical scholarship. In particular, although they claim to measure similar outputs, their results are notoriously poorly correlated (Chatterji et al., 2016) due to the lack of unified assessment perimeters and choices of indicators (Berg et al., 2019).

Some have concluded that scoring systems contribute to information fatigue and mislead corporations and end-users (Mooij, 2017; Wegener et al., 2019). The EU seems to share these concerns, as it recently adopted legislation regulating the transparency and integrity of ESG rating activities (Transparency and integrity of Environmental, Social and Governance rating activities, 2024). Furthermore, there appears to be growing dissatisfaction among rated companies and companies using the ratings to make decisions (SustainAbility, 2023). The current state of affairs could ultimately result in less investment in ESG measures as corporations lack clear incentives (Berg et al., 2019), financially penalize companies receiving mixed results across scores (Wang et al., 2024), and lead to funds and contracts misallocated to laggard corporations (Fichtner et al., 2024).

This paper aims to address these issues by inventorying the current corporate climate performance scoring systems and assessing each of them against the criticisms raised in the scientific literature. We chose to focus on climate change for two main reasons. First, climate change is an issue that, if left unaddressed, can undermine other UN sustainable development goals. Further, our market analysis showed that certain actors were specializing in corporate climate performance, which translates increasing demand around the climate topic. Our review effort found 18 different issues (around the reliability, accuracy, fairness of ESG scores and whether they have effectiveness in terms of driving environmental transition) and 41 scoring systems. We highlight significant disparities in assessment scope and approaches employed, with different scores aiming to measure distinct aspects of corporate ESG or climate performance. Furthermore, while the overall transparency of the systems was found to be satisfactory, most systems are still hazy on the indicators and weighting functions they use. On average, 35% of the scoring systems aligned with best practices, but with significant disparities across different issues. We conclude that there is no one actor in the market that is addressing all of the focal concerns yet, and we therefore call for prudence when using ESG or climate scoring results and for further market regulation.

This work contributes to the existing scientific literature by providing a more exhaustive, up-to-date, critical review of corporate climate scoring systems. Various reviews of uses and approaches of corporate ESG rating systems have been published but do not systematically assess the systems they review against the issues identified (Diez-Cañamero et al., 2020; Escrig-Olmedo et al., 2019; Patara and Dhalla, 2022; Saadaoui and Soobaroyen, 2017; Siew, 2015) or are limited to a specific type of score (Fichtner et al., 2024; Patara and Dhalla, 2022). Further, none of these reviews claims to perform a deep literature review to identify the limitations of ESG scoring.

The following methods section (2) reports the process employed for this analysis, the results section (3) presents the output of our research, and the discussion section (4) focuses on key limitations and possible interpretations of our work.

2   Method

We developed a stepwise research approach, summarized in Figure 1.

First, our literature review on ESG rating systems was conducted using Google Scholar® by running separate searches for the keywords "corporate sustainability performance", "sustainability measurement systems", "environmental performance indicators", "corporate sustainability disclosure", "corporate climate performance", "ESG scoring", "ESG rating and "corporate climate disclosure". We isolated studies centered on corporate sustainability rating systems and reviewed the articles they cited to build a database of articles, following a backward snowballing method. We discarded any research that used ESG scoring systems as a measure of corporate sustainability performance without discussing the systems, as well as non-peer-reviewed preprints, articles that we found to be of insufficient quality (e.g. missing sources, containing inconsistencies or improper syntax), and other miscellaneous materials (newspaper articles, FAQs, webinar transcripts). We stopped our search when further citation checks yielded no additional relevant studies. Given how the topic intersects with the private sector, we complemented this approach by reviewing the gray literature. We thus ran a Google search for the same keywords as above, and added 14 market reports and agency reports to our database. In total, we compiled a corpus of 70 documents, including 56 peer-reviewed articles. The articles have been published between 2006 and 2025, in a range of journals including *Journal of Cleaner Production*, *Sustainability*, *Business Strategy and the Environment* and *Journal of Business Ethics*.

Second, we examined the compiled set of documents to list scoring system providers they mention. To account for mergers and acquisitions in the ESG scoring market, we combined merged entities into a single entry. We consolidated this literature analysis and conducted an online search for further "ESG corporate rating systems", which added 6 smaller and more recent actors to our list. Based on the information available on the identified rater's websites, we then identified the scores they offer. In line with the scope of this analysis, we
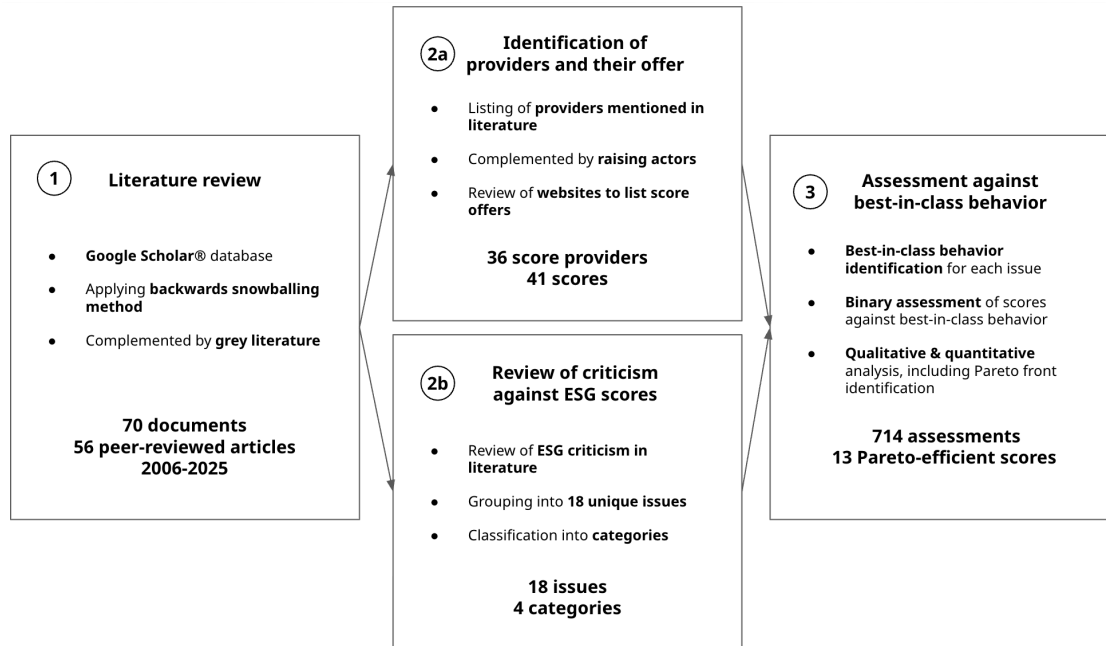
Figure 1: Visual summary of the approach of our work.

excluded scores that do not cover corporate climate performance, such as those focused exclusively on gender equality or biodiversity, and product-level scores. We identified a total of 41 scoring systems across 37 raters.

In parallel, we reviewed all 70 inventoried documents in order to identify concerns raised around ESG scoring systems. We listed individual issues that were presented as novel ideas or cited from further research, and then grouped them into categories. We then converted each criticism into a pass/fail criterion by identifying best-in-class practice for each issue among our 41 scoring systems. To do so, we browsed the publicly available information on each identified score system to determine how the system dealt with each concern. For instance, we identified "Criteria choice is justified by a materiality assessment" as best-in-class practice when it comes to the issue of scores focusing on non-material externalities. The variability in raters' responses to issues sometimes made it challenging to identify best-in-class behavior. For example, it is unclear whether differentiating weightings across industries, geographies, and company sizes is relevant for all scores, regardless of their scope. We discussed these cases in depth, and then established pass/fail criteria after reaching consensus.

We then performed a binary assessment of each scoring system against the criteria identified in the third step of our methodology, using public information available online. Scoring systems passed the criteria if the information available confirmed that they were aligned with the best practice. The scores were not assessed if public information on the approach used for the scoring was not available on the website nor made available after contacting the rating provider. If there was partial evidence the score matches best-in-class practice, but insufficient information to formally conclude, then the score were given a 'Partial' evaluation on the criterion. If the criterion did not apply to the rating due to its specific scope or structure, the assessment was noted 'Not applicable' (N/A). For instance, ratings stating that they use a double materiality approach to assess their criteria weights received a passing grade on the issue of focusing on non-material externalities; ratings that did not justify their weighting choice were not assessed; and ratings that did not rely on a weighting mechanism but only, for instance, on a set of criteria to pass, were noted 'Not applicable'. We further identified and described scores belonging to the Pareto front, i.e. scores that are not strictly dominated on all criteria by any other investigated score.

Finally, we sent the results back to rating providers to get confirmation that we had correctly identified the

scores they offer and to allow them to provide feedback on our assessment. Any additional content provided in the raters' responses was used to enrich the analysis, provided it was supported by public sources of information. An overview of the exchanges with raters is provided in Table 4 in supplementary material.

3 Results

3.1 Current raters and products

3.1.1 Identified raters

Figure 2 gives a schematic overview of the scoring process and actors involved. Figure 3 plots the identified actors grouped according to their activity, and ordered based on number of references to them in our literature review. Table 4 and 2 complete these Figures and lists the documents mentioning each actor and the sources used to characterize them. We identified 29 actors by browsing our corpus of literature, plus another 7 actors via a Google query. These raters include smaller, more regional actors like Carbone 4 and Ethifinance, newcomers such as Insight Investment, BLab, and ClimateAction100, key organizations like the Science Based Targets initiative (SBTi), which other raters incorporate into their scoring methodology, and ADEME ACT Solutions, launched by the French environmental government agency to assess corporate climate performance.

The most cited actors are historical investment consulting firms that, in some cases, acquired companies specialized in ESG data scraping and ESG scoring (e.g. MSCI and KLD or Innovest). While these conglomerates confirm the strong consolidation of scoring providers since the 1990 observed by Mooij, 2017 and Muñoz and Smoleńska, 2023, other more recent, specialized players have nevertheless joined the market. In particular, the CDP, an NGO, stood out as one of the most frequently cited raters. Other market participants include smaller financial consulting companies that claim to be more ambitious and reliable than market leaders (e.g. Ethibel, Insight investment, Carbone 4) or are focused on emerging markets (e.g. SynTao Green Finance and Wind in China), startups looking to disrupt the market by integrating artificial intelligence into ESG data collection and analysis (e.g. Sensefolio, RepTrak, RepRisk), banks building their own scoring systems (Bank Sarasin & Co, ZKB Sustainability research), and startups specialized in supply chain reporting (Ecovadis). Finally, BLab, ADEME ACT Solutions, ClimateAction100 and SBTi stand out as nonprofit, impact-driven actors.
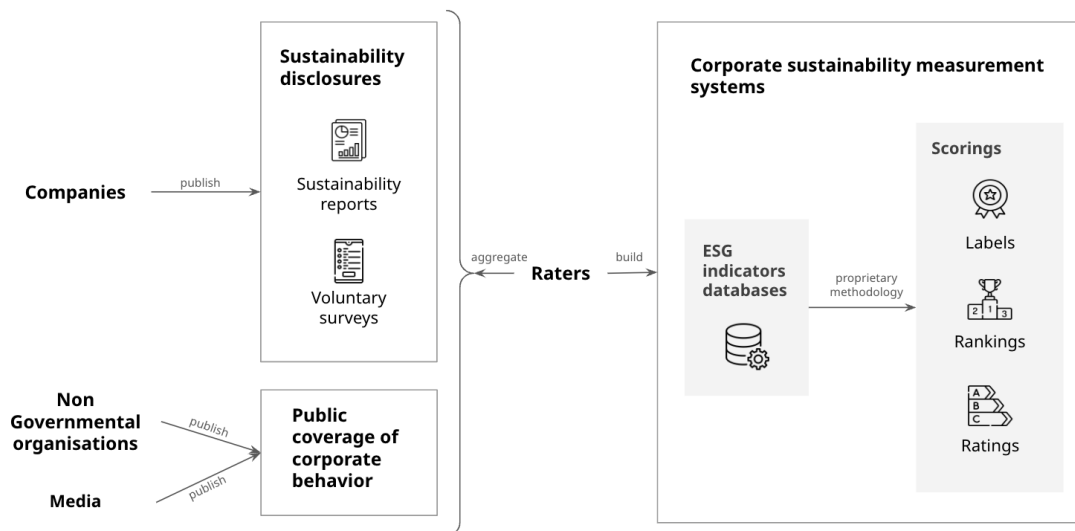

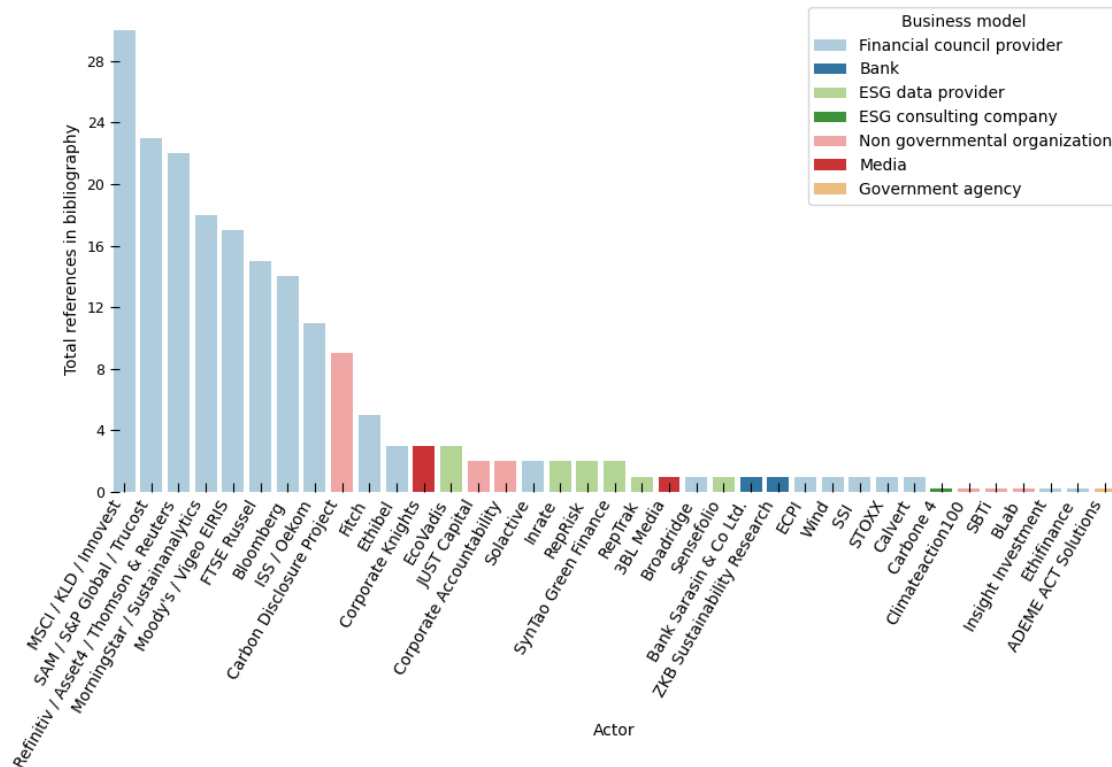**Figure 2:** Schematic overview of the ESG rating process and actors

Figure 3: Identified actors and actor conglomerates according to total number of references to them in the literature review. Colors denote their main sphere of activity, as described in the legend. Actors identified using a complementary Google query are listed on the right of the bar chart.

3.1.2 Identified scoring systems

We then identified all scores offered by the actors inventoried, considering only those systems that include criteria related to climate change. We identified 41 competing scoring systems among the 37 actors. Some providers offer up to three relevant ESG scores (e.g. MorningStar/Sustainalytics). Among our 37 initial actors, 6 actors identified had no proprietary methodology, and thus either rely on their peers' scoring systems (STOXX uses the J. Safra Sarasin ESG Rating, Wind uses SSI's approach, and Solactive uses ISS's UN SDG methodology to build its ESG indexes) or only offer custom ESG evaluations (Calvert). Furthermore, Ethibel has discontinued its rating activity and Moody's/Vigeo EIRIS is discontinuing its rating activities. Table 5 and 6 (see Supplementary material) offer an overview of the scoring systems identified, the universe of firms they cover, their data sources and the availability of their results.

The systems identified were diverse in nature: among them, 21 are ratings, 9 are scores, 4 are rankings and 2 are labels. Most of the systems identified do not specifically assess climate issues, but we rarely had to exclude a score from our assessment for not covering climate, i.e. we rarely found scores that only covered other ESG issues. Actors either source their input data passively from available public data, including corporate websites, yearly CSR reports, or other voluntary disclosures on specialized databases, government databases and media, or employ an active data collection method and ask companies or stakeholders to fill out questionnaires or build application files. The public availability of input data and scoring results depends on the provider's business model. Raters choose to either monetize the data or results to sell to financial institutions and corporations doing market research (e.g. MorningStar/Sustainalytics), or choose to monetize the verification of the data and the administrative tasks underpinning the scoring process (e.g. SBTi, BLab). Some systems appear to be used exclusively for internal operations and do not directly con-

tribute to the raters' revenues (for instance, Sarasin Bank uses their proprietary methodology to provide custom investment counselling). The universe of rated companies is generally designed to be as extensive as possible given the available data, except for financial actors that tend to focus on listed companies and ignore small and medium-sized companies (e.g. 3BL Media's 100 Best Corporate Citizens, ClimateAction100). A significant number of raters use input data gathered by other market actors (as exemplified by MSCI and Moody's latest alliance) or partially or fully rely on other actor's scoring methodology to process the data. For instance, most raters rely on SBTi's labels to validate that corporate GHG reduction targets are consistent with the Paris Agreement (e.g. CDP, Ecovadis).

We categorized the market offers into three groups according to the focus of the assessment: i.e. either risk, impact or reputation. Note that the name of the score is not a sufficient indicator of the underlying approach applied.

The largest group consists of scoring systems focused on assessing the financial risk tied to ESG issues, particularly climate change. These systems identify and assess the physical risks driven by climate change that threaten a company's operations and assets. They include the impact of extreme events such as flooding, and the repercussions of chronic issues such as droughts and coastal inundation. Some of these systems also analyze the risks and opportunities stemming from possible market, regulatory or technological changes. These scoring systems generally consider both current company or industry exposure to risks and the mitigative actions the company plans to implement. Prime examples of such ratings are the Morningstar/SustainAnalytics ESG Risk rating and SAM/S&P Global/Trucost's climate transition assessment.

The second most represented scoring type in our dataset focuses on measuring corporate socioenvironmental impact. This includes analyzing current emissions levels by studying and possibly benchmarking corporate absolute and relative emissions, but may also entail estimating their future evolution, considering past trends in corporate emissions and the allied reduction targets and action plans. These scores may also scrutinize the associated governance structure (e.g. use of carbon pricing for internal decision-making). Emissions allocated to companies may include the emissions released throughout their end-to-end value chain (scope 3 emissions) or just focus on direct emissions from corporate assets (scope 1&2). Prime examples of such ratings are the CDP's climate score and SSI's carbon neutrality rating.

The third and final smaller group of scores centers on measuring corporate ESG reputation. They survey and monitor public opinion to evaluate the degree of trust that the corporations' is acting responsibly. In particular, they focus on public ESG controversies relayed via conventional and social media, and rate their relative importance and monitor their impact over time. These ratings do not rely on corporate disclosures as input data. Prime examples of such ratings are the RepRisk and JUST Capital scores.

These groups are not mutually exclusive, as some systems consolidate different approaches into a single score (for instance, ISS/Oekom's ESG Corporate Rating investigates both the financial and impact materiality of companies).

Figure 4 charts the distribution of scores across actor business models, scoring types and assessment focuses. It shows risk-based assessments are mainly offered by financial advisory businesses and banks, while other actors generally publish impact based assessments. Reputation assessments are proprietary to specialized ESG assessment companies or NGOs. Rankings and labels are mostly distributed by media or NGOs, whereas scores and ratings are distributed evenly among ESG data providers, consults, and banks.

3.2   Review of criticism raised in the literature

Below we overview the criticisms raised against ESG rating systems in the scientific literature. Among the 70 documents reviewed in our corpus, 39 contained at least a criticism of ESG rating systems. We grouped these commentaries into four categories based on which aspect of the score they challenge, i.e. its reliability, accuracy, fairness, or effectiveness in terms of driving improved ESG performance. These categories are not mutually exclusive: for example, the financial dependency of some raters on the companies they rate affects
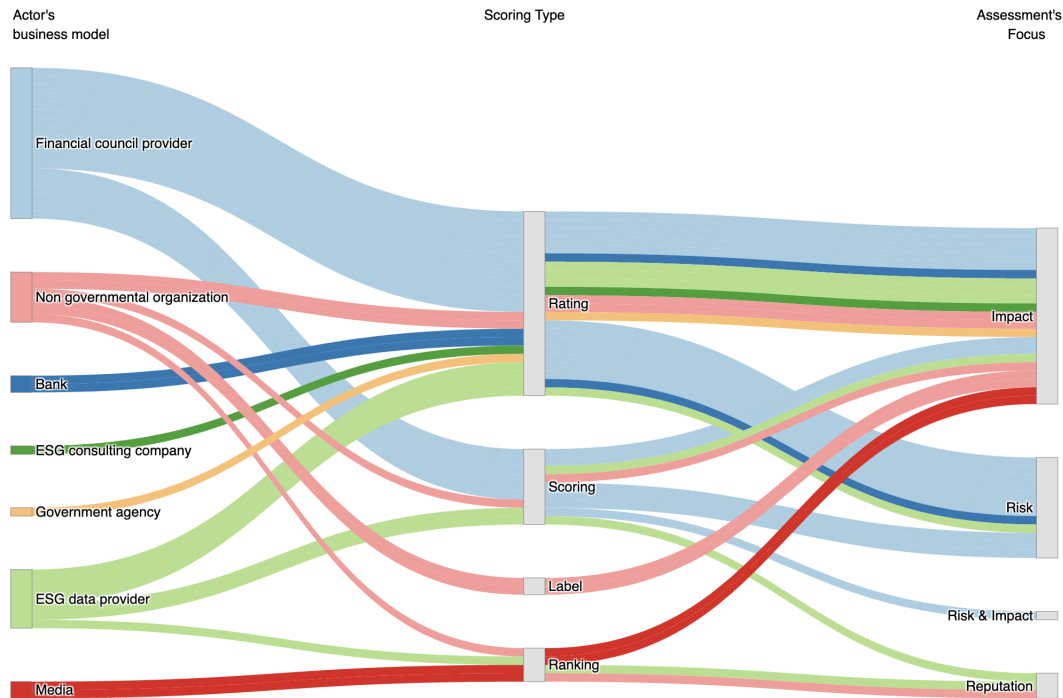
Figure 4: Distribution of scores across business model, scoring types and assessment focuses. Colors denote the actor's business models, as described in the legend of Figure 3.

their reliability and may also impact the fairness of the results. To facilitate readability, the references to the papers raising each concern can be found in Table 3 as supplementary material.

3.2.1 Reliability

The main criticism raised and discussed in the literature is the reliability of the actors involved in ESG scoring. The reliability of a score is its capacity to deliver a consistent and comparable assessment for a single company or for companies that share similar characteristics. Criticisms around reliability, with 53 total mentions, were among the two most frequent concerns.

The lack of transparency in raters' scoring approaches was the most frequently mentioned concern. This was fully expected, as this lack of transparency often hinders researchers' efforts to understand and discuss score results. This opaqueness concerns score weightings, scopes, criteria, thresholds, and hypotheses, depending on the raters considered (Windolph, 2011). While we consider that lack of system transparency mostly hinders reliability by limiting trust in the raters, we recognize that it also raises concerns over the accuracy of the scoring as it creates a barrier to auditability of results.

The financial ties between the rater and the rated companies or the lack of an independent review of results were also a major point for attention. Researchers questioned whether raters can realistically remain a reliable third party assessor when they rely on the companies they are rating for their revenue. While it be a stretch to suggest that corporations are able to directly purchase favorable ratings, we do argue that this dependency inevitably influences the scoring methodology. Companies have the option of paying for data verification following a preliminary assessment in order to secure a final grade or label (as is the case for the BCorp or SBTi labels). The grading system consequently has to be lenient enough to ensure that a sufficient number of companies receive attractive preliminary grades and request data verification.

Finally, the quality and comparability of the input data used by ESG scoring systems emerged as a growing focus for scrutiny. Scoring systems rely on public corporate disclosure content or corporate responses to rater-specific ESG questionnaires. Yet, this content has been shown to contain inaccurate, over positive or deceptive information, and is rarely verified by an independent third party (Bingler et al., 2022; Boiral, 2013; Callery and Perkins, 2021; Lyon and Montgomery, 2015). Inaccurate reporting is made more probable when corporations are not required to follow frameworks that define the scope and methodology for computing the information to disclose or allowed to provide qualitative data (Christofi et al., 2012), and even with right guidelines, companies could still provide erroneous or manipulated information Brander et al., 2023. Major concerns thus center on the lack of requirements for standardized, quantitative corporate inputs and the absence of information verification during the scoring process.

3.2.2   Accuracy

Second, criticisms frequently cast doubt over the accuracy of ESG scoring. This group of criticisms doubts the capacity of ESG scoring systems to provide correct information on corporate performance. This set accounted for 55 total mentions across the 39 critical documents studied.

First and foremost, a report by France Stratégie underlined the necessity for ESG scoring systems to have rating criteria that go beyond what is enforced by regulations (France Stratégie, 2024). Although this was not the most frequent criticism in the category, meeting it appears to be a prerequisite, as ESG efforts are most commonly defined as voluntary (Sarkar and Searcy, 2016).

Furthermore, scoring systems commonly attracted negative feedback on their criteria weighting systems. The most common concern was that the weighting and scope of performance criteria are chosen arbitrarily or, more specifically, without considering the materiality of the externalities of a company's activities.

Researchers also criticized the possibility for companies to compensate for poor results on part of the assessment with acceptable results in other subscores. Indeed, current visions of ESG call for a holistic approach, i.e. tackling issues in parallel and avoiding worsening impacts for some stakeholders while trying to enhance performance for others. This has prompted some authors to recommend integrating stakeholder input into the scoring methodology design through open consultation. Similarly, some authors have argued that rating systems fail to account for performance at value-chain level, neglecting to account for indirect impacts that corporations are dependent on, or even advocated excluding controversial sectors altogether (e.g. oil & gas, tobacco, air travel), as the proven magnitude of their negative impacts rules out commending their ESG strategy.

Lastly, part of the literature condemned the ESG scoring systems for focusing only on rating the quality of corporate management and disclosure of ESG issues and failing to assess the magnitude or predictable future trajectory of their externalities. Critics also highlighted that most scoring systems fail to embrace absolute sustainability and compare corporate performance with downscaled planetary boundaries.

3.2.3   Fairness

Third, critics have touched on the capacity of ESG scoring systems to demonstrate impartial and just treatment. In particular, scores have been repeatedly criticized for failing to properly account for company size, industry, or geography, leading to a negative bias against companies with fewer financial and human resources. Furthermore, Berg et al., 2019 found evidence of a rater bias, where companies that excel in certain criteria may face less scrutiny in other areas, as raters assume their overall performance will be equally strong.

3.2.4   Effectiveness in driving improvements

Lastly, although not widely recognized as a primary function of ESG scoring systems, their ability to drive corporate environmental transition has occasionally been questioned. More specifically, some have deplored

the fact certain methodologies do not force companies to improve in order to maintain their grade year-on-year or else do not help them meet evolving requirements.

3.3 Assessment of current corporate measurement systems

3.3.1 Identifying best-in-class practice

Table 1 offers an overview of the issues listed above and the associated minimal pass criteria used to binarily assess the raters.

The criteria reflect best-in-class practices observed among the identified scores. Scoring systems displaying best-in-class practices are identified in Figure 5.

First, note that despite our efforts, we could not assess rater bias. None of the reviewed score systems addressed or acknowledged this, and the lack of transparent data hindered finding numerical evidence.

On the topic of reliability, we found that despite the broad criticism, some systems disclosed their methodology in full, and some actors are financially independent from the corporations they assess. Similarly, some systems rely only on quantitative, standard-backed information and systematically request supporting documents evidence (e.g. bills or written policies) to ensure the veracity of the information provided by rated corporations. On the topic of accuracy, the most advanced raters either avoid weighting altogether or else apply a transparent and scientifically-justified process. We deemed both these approaches equally acceptable. For example, JUST Capital determines the weighting of the issues assessed in their annual corporate ranking based on votes from a statistically significant sample of the American public. Additionally, some scores systems completely forbid compensation of partial results by design. They make up the final score either by taking the minimum of subscores on different ESG pillars, by setting minimum requirements for companies to meet on each dimension, or by rating companies separately on each dimension. While most scores are industry-relative or assess corporate performance against arbitrary criteria, SBTi aims to compare corporate performance to the planetary boundaries on GHG emissions and is integrated as a criterion in other scores. Furthermore, some raters enlist a representative panel of stakeholders in the assessment, for instance by public consultation on the weightings used (JUST Capital) or by integrating stakeholders in the methodology review process (ISS ESG).
On the topic of fairness, the actors that have advanced most on fairness adapt their scoring to company size, industry and geography. Lastly, on the topic of effectiveness, some systems systematically raise the expectations on scored companies year-on-year and offer them extensive documentation on how to meet criteria and improve their ESG management.

Identifying best-in-class criteria proved a largely straightforward task, but we had to make some arbitrary choices in order to have operational rating criteria. First, we decided not to select a minimum list of sectors to exclude, as ratings generally do so on moral grounds. We thus accepted any list of exclusions. Second, we decided not to require scoring adapt its methodology to company size, industry and geography as it might not be relevant for all scopes of scoring. We thus narrowed the criteria down to only assess whether there was at least one of company size, industry or geography taken into account. Finally, due to the lack of transparency in the scoring systems and the variety of scopes covered, we narrowed the criteria down to check that at least one scoring criterion went beyond local legislation.

Table 1: Table summarizing criticisms of reliability and accuracy in CSR scoring systems according to gray and scientific literature, along with criteria chosen to evaluate scoring providers on each issue. Criteria correspond to best-in-class practice observed among the scoring we scrutinized. Actors demonstrating best-in-class criteria can be identified using Table 5

Group	Issue Keyword	Issue	Best in Class Criterion
Reliability	Transparency	The scoring methodology is not transparent	Methodology is available in full online
Reliability	Independency	Raters are not independent financially from rated companies	There are no financial ties between rater and rated companies
Reliability	Standardization	Input information used is subjective and not standardized	The rating systems uses quantitative, standard-backed data points
Reliability	Verification	Input information is not verified in the rating process	Input information is verified by requesting supporting documents
Accuracy	Weighting	Raters choose arbitrary weightings for the issues covered	Scoring does not require weighting or uses a transparent science-based weighting
Accuracy	Compensation	Rated companies have the possibility to compensate for low scores on some criteria	Companies cannot compensate failing on categories by performing well on others
Accuracy	Relativity	Rating is relative and does not take into account planetary boundaries	Rating compares corporate performance with planetary boundaries
Accuracy	Immateriality	Raters focus on immaterial ESG aspects	Criteria are justified by a materiality assessment

Group	Issue Keyword	Issue	Best in Class Criterion
Accuracy	Impact	Ratings are based on disclosure and impact management and not negative impact magnitude	Rating takes into account levels negative impact CSR issues and failing to assess the magnitude of externalities
Accuracy	Forward look	Ratings are based mostly on backwards looking information and do not consider future results	Rating projects future evolution of corporate performance
Accuracy	Stakeholders	Stakeholders' opinions are not properly taken into account in the rating	A representative selection of all company stakeholders are solicited in the rating process
Accuracy	Sector exclusion	Controversial sectors are not excluded from rated companies	A list of controversial sectors is excluded
Accuracy	Value chain	Raters focus on company performance rather than reflecting at the value chain level	Criteria include impacts in the company's value chain
Accuracy	Regulation	Rating criteria do not go beyond regulation	At least one criterion is more ambitious than what is mandated by regulation applicable
Fairness	Specificity	Method does not take into account company size, activity, geography resulting in bias	Approach takes into account at least company size, activity, or geography
Fairness	*	Companies with a good performance on one criterion get less sharply scrutinized on the other criteria	*Impossible to assess without access to the company input data*

Group	Issue Keyword	Issue	Best in Class Criterion
Effectiveness	Progress	Companies are not expected to make progress year-on-year in order to retain the same rating	Criteria are made progressively more ambitious every year
Effectiveness	Support	Rating process does not entail support to drive improvement at rated companies	Rated companies are offered documentation on how to meet criteria

3.3.2   Assessment of scores against best-in-class behavior

Figure 5 illustrates how scoring systems performed against the best-in-class criteria. Supplementary material includes the sources used for the assessments (Table 4), a written version of Figure 5, and detailed rationales for each assessment (7, 8, 9 and 10).

An important opening comment is that there is only a limited amount of publicly-available information on the scoring systems. Overall, we failed to find any public information on more than 20% of the methodologies, and we failed to firmly conclude on whether the score passes the criterion in 18% of the score–criteria pairs. In particular, most raters fail to disclose clear, specific information on the nature and verification of the data inputs used and on how methodologies were updated. Indeed, we were not able to assess how raters assessed input data in 35% of the cases, how raters verified data in 47% of cases and how raters updated their methodology in 41% of the cases. In the current state of the market, it is thus unclear whether most ESG and climate scoring systems actually improve the reliability of information disclosed and proactively push companies to improve year-on-year.

Similarly, most scores failed to disclose whether corporate emissions levels or projections were compared against planetary boundaries. Others offer only relative final results (e.g. meaningful only when compared against results from comparable peers). We thus recommended refraining from using any ESG scoring to claim a company or set of companies is absolutely sustainable or improving towards absolute sustainability.

Lastly, almost all rating systems assessed here failed to disclose whether they relied on qualitative data points and how they analyzed them.

When sufficient information is available to draw conclusions, our research finds that the market is still relatively misaligned with best practices, with over 30% of assessments failing to meet our criteria. In particular, the market under-addresses the elements scrutinized by the upcoming European legislation (Transparency and integrity of Environmental, Social and Governance rating activities, 2024): according to our analysis, only 29% of the actors publicly disclose a full methodology, and only 50% of scores are issued by to an actor whose business model does not depend on rated companies for revenue.

Furthermore, scoring systems that rely on weighting systems still perform very poorly in terms of addressing criticisms on weightings used: only 17% of them have either no weighting or a transparent, science-based weighting, and while a significant 47% of them claim they have a weighting backed by a materiality analysis, it is unclear how this promise translates in practice, as only a minority of the actors disclosed how this materiality was assessed. Even when the materiality assessment process is described, it can be questioned: for instance, Refinitiv/Asset4/Thomson&Reuters claims to measure topic materiality by considering the quantity of industry specific disclosure for each data point, which might not be perfectly correlated to either the magnitude the financial risk caused by the ESG issue or the magnitude of the impact generated by the company's activity. Moreover, the definition of term 'materiality' varies significantly from actor to actor, with some focusing only on financial materiality (outside-in), while others focus on environmental and social materiality (inside-out). Only ISS/Oekom's ESG Corporate rating and S&P's global ESG score clearly claim to combine both approaches. On the same note, most methodologies claim stakeholder are involved in defining the scoring system, yet closer inspection reveals that the term often refers only to investors and the rated companies.

Only a few scoring systems address whether companies have the possibility to compensate poor performances on certain ESG dimensions, with for instance minimum requirements on certain criteria in order to attain certain ratings. This effectively means that, to our knowledge, the average current generalist ESG ratings cannot be used to ensure companies have at least an acceptable performance on all relevant aspects of socio-environmental performance. More specifically, a global ESG rating cannot be used as a guarantee of corporate climate performance. Lastly, ESG scores currently mostly miss the mark on helping rated companies fill their requirements (which only 24% of scores discuss in their methodologies) and progress year-on-year (which only 8% of the scores where this is applicable discuss).

Our analysis nevertheless shows some market progress. First, almost all the studied ESG ratings have at least a climate-related criterion that goes beyond the regulatory expectations and take into account impacts across the value chain by either scrutinizing or requesting the disclosure of indirect emissions. Similarly, a growing number of actors (48% of scores) appear to go beyond disclosure and account for levels of negative impact in their analysis. In the case of corporate climate performance, this most often translates into the benchmarking of relative emission levels against industry peers. In addition, 56% of scores we assessed integrate elements relating to the future trajectory of the company's emissions. While this is a progress, it seems that the assessments tend to only consider corporate emission reduction targets without offering a critical review of the corporate emissions reduction strategies needed to hit those targets. Lastly, more than 88% of scores differentiate their assessment method according to company size, geography or industry. Note that two of the criteria that we find a significant proportion of scores were found to pass are criteria for which we had to make an arbitrary choice, as the best practice was unclear or too hard to assess.

In addition to these overarching trends, we note that even within a group of score sharing a common focus (as defined in section 3.1.2), the scores have diversity of performance against our criteria. Similarly, we found no notable differences in overall performance according to type of actor or score format. In this context, any of these variables do not inherently guarantee high-quality scores.

All in all, no one ESG scoring system answers all the concerns raised in the literature. However, the Pareto-efficient offers are highlighted in orange in Figure 5. Since the ratings perform quite differently across criteria, we found 13 Pareto-efficient scores. A few notable ones include the BCorp label (the best-performing score across our criteria), Carbone 4's score of compatibility with the Paris Agreements (only uses standardized, quantitative data and takes into account levels of negative impact) and JUST Capital's annual JUST capital corporation ranking (which is among the few scores involving a representative panel of stakeholders to assess corporations). We suggest prioritizing Pareto-efficient actors or recomputing the Pareto frontier on a subset of systems with desired characteristics (e.g. score focus or data availability) when choosing a data provider.

4   Discussion

Building on our findings, this section discusses the key limitations and potential interpretations of our work. It also highlights elements of discussions with raters.

4.1   Limitations

First, all our results are based on publicly-available declarative information published by raters. The rater's practices may be poorly defined and it remains unclear to what extent they are applied. For instance, a few systems claim their criteria weightings are based on a double materiality assessment to ensure they reflect the magnitude of impact on all stakeholders. This may be far from accurate, given the massive resources required to properly assess the materiality of thousands of criteria across a multitude of stakeholders and industries. Note too that other criteria lack specificity. For instance, it remains unclear what qualifies as a 'sufficient' supporting document to guarantee the veracity of information provided, as they raters do not publicly go into further detail on this point.

Second, not every concern was relevant to all scoring types and focus areas. In particular, issues related to weighting, compensation of poor performance or choice of criteria are not applicable to labels that do not rely on an underlying scoring system such as MSCI/KLD/Innovest's Implied Temperature Rise rating. Similarly, other issues pertaining to compensation across performance of various ESG dimensions are not applicable to single-criteria evaluations, and data verification concerns do not apply to ESG reputation ratings as they do not rely on corporate disclosure. Finally, some assessments measure corporate performance against an absolute threshold (e.g. remaining carbon budget to meet the Paris Agreement objectives). These scoring systems cannot be expected to be made more ambitious year-on-year. We attribute the mismatch between concerns and scores to the diversity of scoring perimeters, focuses, and formats (see section 3.1.2).

Furthermore, we question the relevance of some criticism addressed to ESG scoring systems and showcase tradeoffs between criticisms. Indeed, most scores fail to exclude a list of controversial sectors from their assessment pool, but in some cases it proves justified. Some scores set out with have a particularly punitive approach that leads them to focus on companies in the most controversial industries (e.g. the Corporate Accountability's Corporate Hall of Shame), whereas others voluntarily choose to focus on controversial sectors as they are seen as key sectors for transitioning to a net-zero global economy (Climate Action 100's Net Zero Company Benchmark). Regarding tradeoffs, scores that integrate stakeholder opinions in their ratings often fail on other criteria related to the materiality or ambition of their assessment (e.g. Just Capital, The Global 100 list). We explain this finding by the difficulty identifying relevant stakeholders and the fact that the general public generally under-estimates global socio-environmental issues. Finally, ratings that directly depend on the rated companies for revenue (e.g. S&P Climate Transition Assessment) typically outperform their peers in providing support to foster corporate ESG improvements. We conclude that, although direct financial dependency undermines the rater's reliability, it can help improve the way rated companies are supported in their efforts to lower their impact.

Lastly, we emphasize that best-in-class practice does not always align with the ideal practices that raters could demonstrate. A major concern is weighting. For instance, alignment with planetary boundaries and negative impact levels feature substantially in the final results. However, here we only assessed whether they were included as rating criteria. Likewise, we could expect raters factor in any company characteristic that affects corporate ESG performance rather than only factoring in size, industry or geography.
Further conceptualization is needed before we can define absolute requirements for scores.

4.2   Challenges from ESG Raters

We presented our initial analysis to market actors to ensure that we had correctly represented their methodology. This section provides an overview of the rater's counterarguments and justifications given for the methodological limitations we had underlined.

The market actors we exchanged with offered relevant documentation and talking points and thus appeared to be aware and sensitive to concerns raised by the academic community. Some actors showed proactivity and signed an industry code of conduct ESG Data and Ratings Working Group (DRWG), 2023 that notably sets standards on financial independence and transparency.

Actors justified their lack of transparency as a precaution against plagiarism ESG Data and Ratings Working Group (DRWG), 2023. This argument warrants skepticism, given that some of the most well-known and ambitious products on the market (e.g. the CDP Climate Score) have fully transparent methodologies. We posit that collecting input data is complex enough to deter copying methodologies.

Some actors acknowledged the poor quality of declarative ESG data (for instance, RepRisk explicitly developed their methodology to avoid this issue). However, most raters stated that the collection of specific and verified data is an arduous process that goes against their efforts to expand the score's company universe. On the same note, some actors discussed the relevance of mandating using only quantitatively data when quantitative corporate disclosure is known to carry bias and uncertainty.

Actors typically defended their choices of scope, weighting, and ambition as being solely driven by client needs. However, we also attribute this diversity of weighting choices to the difficulty involved in performing an industry-specific materiality analysis across hundreds of criteria. Furthermore, given the similarity of input data sources, ESG scoring results should be similar if the weightings of the criteria were science-based and rigorously applied. This would create a degree of redundancy that would threaten the actors financially, since their market shares currently overlap. (SustainAbility, 2023) We thus argue that the varying scopes, weightings and ambitions also result from the need for different market actors to differentiate their results.

The ambition of scores can also limit their capacity to discriminate between companies. Indeed, ambitious ESG scores tend to rate companies poorly, and, most importantly, similarly. We theorize ambitious

scores can thus only be niche, dedicated to inform companies of their shortcomings but unlikely to become a massified decision-making product. We consider this inherent dependency on average corporate practices limits the alignment between scientific expectations and ESG scores.

5   Conclusion

This research contributes to the emergence of accessible and trustworthy corporate climate data. We identified the current corporate climate performance scoring systems, reviewed the literature to extract quality criteria on the scores, and assessed the scores against these quality criteria.

While the market has experienced a range of mergers and acquisitions, there is still a significant range of options for corporations and financial actors to choose from to support their decision-making. The available scores span a variety of focuses. Some measure the magnitude and management of climate and low-carbon transition risks, others focus on GHG management, and some assess public perceptions of corporate action. All in all, the ratings market warrants regulatory standardization of assessment approaches in order to avoid errors and manipulations.

The scholarship raises a number of issues on the reliability, accuracy, and fairness of climate performance scores and whether they are effective in driving corporate improvement actions. The issues raised seem overlooked by raters as they do not typically focus on them in their marketing strategy, and the upcoming European legislation (Transparency and integrity of Environmental, Social and Governance rating activities, 2024) does not address all of them. However, they question whether current scoring systems effectively help to direct investment efforts and contracts towards actors working to transition to a low-carbon economy.

For each of these concerns, we identify best-in-class rater practice, that is, the most relevant rater practice for addressing the issue. In some cases, best-in-class practice is still insufficient to fully address the concern. For instance, we find further progress is probably needed on ensuring that impact metrics are as scrutinized as data disclosure.

Our assessment of the scoring systems against these best-in-class practices found heterogeneous results. On one hand, scores often fall short of best practice in terms of transparency, data input quality, potential to compensate for poor subscores, and justification of the weighting systems. On the other hand, the scores are relatively aligned with best practices when considering whether they assess corporate performance at value-chain level, consider company-specific factors, and go beyond regulatory requirements. We also identified trade-offs between criteria, and discussed the relevance of certain scientific expectations. All and all, we find that no one score addresses every concern raised in the literature, and we recommend an in-depth study of the methodologies employed before choosing an ESG scoring provider.

This study has certain limitations that warrant further research. First and foremost, we focused on ESG scoring systems that cover climate change. While climate change is a major issue, a similar review on other environmental and social impacts would constructively inform the literature. Further, we acknowledge that another focus, albeit on the same generic ESG scores, could change the outcome of our assessment, as our analysis was centered on climate-related methodology. It could also be useful to replicate our climate-centered analysis, as it only provides a static snapshot of a dynamic market and academic discussion. In particular, we may have missed scores published by early-stage startups or local companies, and we are certain that other assessment criteria will emerge as the scholarship matures.

Second, we relied exclusively on publicly available data to make our assessments. This effectively penalizes data-opaque actors across all criteria and makes this study vulnerable to false declarations from raters. Further research is needed to estimate rater practice empirically rather than relying on voluntary disclosure.

Third, for practical purposes, our assessment is binary and does not reflect all the nuances in the ap-

proaches employed by the raters. To get a fuller picture, we thus encourage readers to read the descriptions of rater practices that fuelled our study available as supplementary material (Tables 7, 8, 9, and 10). For similar reasons, our assessment is relative and only compares scores against best-in-class practice, and in a minority of cases, we had to arbitrarily chose a level of ambition. Our results therefore do not prescribe ideal system practices, and are partially dependent on the choices we made. Ultimately, we urge further academic discussion on the desired behavior of these systems, as they could significantly influence the future economy and our ability to achieve a low-carbon society.

Actor	Scoring name	Number of passing criteria
3BL Media	100 Best Corporate Citizens	3
ADEME ACT Solutions	ACT rating	9
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	3
BLab	B Corp Label (2025 standard)	12
Bloomberg	ESG Score	7
Bloomberg	UN SDG Impact materiality	8
Bloomberg	Various	0
Carbon Disclosure Project	CDP Climate Score	7
Carbone 4	Compatibility score with the Paris Agreement	10
Carbone 4	Carbon Impact Analytics	0
Climateaction100	Net Zero Company Benchmark	9
Corporate Accountability	Corporate Hall of Shame	2
Corporate Knights	The Global 100 list	7
EcoVadis	Ecovadis Medals and Badges	6
ECPI	Carbon rating	7
ECPI	ESG Rating	0
Ethifinance	Unavailable	0
Fitch	ESG Vulnerability score	0
FTSE Russel	FTSE ESG Scores	7
Inrate	ESG impact ratings	6
Insight Investment	Prime climate risk ratings	6
Insight Investment	Prime ESG ratings	7
ISS / Oekom	ESG Corporate Rating	6
ISS / Oekom	Carbon Risk Rating	0
JUST Capital	Annual JUST capital corporation ranking	11
Moody's / Vigeo EIRIS	ESG risk score	0
Moody's / Vigeo EIRIS	Climate risk score	0
MorningStar / Sustainanalytics	Low Carbon Transition Rating	6
MorningStar / Sustainanalytics	ESG Risk rating	3
MorningStar / Sustainanalytics	Physical risk rating	6
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	6
MSCI / KLD / Innovest	MSCI ESG Rating	4
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	2
RepRisk	RepRisk Index	3
RepTrak	ESG Perception & Global RepTrak 100	2
SAM / S&P Global / Trucost	S&P Global ESG Score	7
SAM / S&P Global / Trucost	Climate Transition Assessment	7
SBTi	Science Based Targets labels	8
Sensefolio	Sensefolio ESG framework	0
SSI	ESG Rating	4
SSI	Carbon neutrality rating	5
SynTao Green Finance	SynTao ESG Rating	3
ZKB Sustainability Research	Swisscanto Sustainability rating	5

Criterion columns: Transparency, Independency, Standardisation, Verification, Weighting, Compensation, Relativity, Immateriality, Impact, Forward look, Stakeholders, Sector exclusion, Value chain, Regulation, Specificity, Progress, Support.

Passing percentage (when issue is applicable): Transparency 29%, Independency 50%, Standardisation 12%, Verification 10%, Weighting 19%, Compensation 10%, Relativity 36%, Immateriality 47%, Impact 48%, Forward look 56%, Stakeholders 10%, Sector exclusion 16%, Value chain 62%, Regulation 94%, Specificity 88%, Progress 8%, Support 24%.

Legend:
- Green: The scoring passes the critierion
- Red: The scoring does not pass the critierion
- Yellow: There's partial evidence the scoring passes the criterion
- Blue: The criticism doesn't apply to the rating
- White: There is no public information available
- Orange: Pareto efficient actors

Figure 5: Result of the assessment of the identified scoring systems against best-in-class criteria. Criteria are further described in Table 1. The details of how ratings perform against the criteria are available in Tables 7, 8, 9 and 10 Appendix. To ensure readability, the same content is available with on a table format with written information in the Appendix (Tables 11, 12, 13, 14).

References

3BL. (2024a). *100 best corporate citizens 2024 methodology*. 3BL. Retrieved August 22, 2024, from https://go.3blmedia.com/l/37792/2024-08-02/5y9ggf/37792/1722609873DpTAVUGj/100_Best_Corporate_Citizens_Methodology_2024.pdf

3BL. (2024b). *FAQs*. Retrieved August 22, 2024, from https://100best.3blmedia.com/faq/

Aboukrat, M., Baranna, R., Crépel, A., Daunay, J., Dugast, C., & Jancovici, J.-M. (2022). *Proposal for a new climat indicator - compatibility of solutions with the paris agreement*. Carbone 4. Paris. Retrieved September 19, 2024, from https://www.carbone4.com/files/Publication_2022_NZI_Nouvel_Indicateur_Climat_compressee.pdf

ADEME. (2025, February 28). *The ACT initiative* [The ACT initiative - about us]. Retrieved February 28, 2025, from https://actinitiative.org/en/about-us/

Alkhatib, S., Kecskés, P., & Keller, V. (2023). Green marketing in the digital age: A systematic literature review. *Sustainability*, *15*(16), 12369. https://doi.org/10.3390/su151612369

Arvidsson, S., & Dumay, J. (2022). Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business Strategy and the Environment*, *31*(3), 1091–1110. https://doi.org/10.1002/bse.2937

Avetisyan, E., & Hockerts, K. (2017). The Consolidation of the ESG Rating Industry as an Enactment of Institutional Retrogression: Consolidation of the ESG Rating Industry. *Business Strategy and the Environment*, *26*(3), 316–330. https://doi.org/10.1002/bse.1919

B Lab. (2024a). *B impact assessment*. Retrieved August 22, 2024, from https://www.bcorporation.net/en-us/programs-and-tools/b-impact-assessment

B Lab. (2024b). *B lab global site*. Retrieved August 26, 2024, from https://www.bcorporation.net/en-us

B Lab. (2024c). *Pricing*. Retrieved August 22, 2024, from https://bcorporation.eu/become-a-b-corp/pricing/

Beisenbina, M., Fabregat-Aibar, L., Barberà-Mariné, M.-G., & Sorrosal-Forradellas, M.-T. (2023). The burgeoning field of sustainable investment: Past, present and future. *Sustainable Development*, *31*(2), 649–667. https://doi.org/10.1002/sd.2422

Berg, F., Kölbel, J. F., & Rigobon, R. (2019). Aggregate confusion: The divergence of ESG ratings. Retrieved May 17, 2024, from https://papers.ssrn.com/abstract=3438533

Bernardini, E., Fanari, M., Foscolo, E., & Ruggiero, F. (2024). Environmental data and scores: Lost in translation. *Corporate Social Responsibility and Environmental Management*, *31*(5), 4796–4818. https://doi.org/10.1002/csr.2829

Billio, M., Costola, M., Hristova, I., Latino, C., & Pelizzon, L. (2021). Inside the ESG ratings: (Dis)agreement and performance. *Corporate Social Responsibility and Environmental Management*, *28*(5), 1426–1445. https://doi.org/10.1002/csr.2177

Bingler, J. A., Kraus, M., Leippold, M., & Webersinke, N. (2022). Cheap talk and cherry-picking: What ClimateBert has to say on corporate climate risk disclosures. *Finance Research Letters*, *47*, 102776. https://doi.org/10.1016/j.frl.2022.102776

Bloomberg Professional Services. (2024a, June). *Bloomberg Sustainable Finance Solutions, UN SDG Impact Materiality, Outline to Bloomberg's Approach*. Bloomberg.

Bloomberg Professional Services. (2024b, November). *Environmental, Social and Governance (ESG) Scores, Methodology*. Bloomberg.

Bloomberg Professional Services. (2024c, December). Bloomberg - Entreprise ESG Data Catalog. Retrieved December 20, 2024, from https://www.bloomberg.com/professional/products/data/enterprise-catalog/esg/#overview

Boiral, O. (2013). Sustainability reports as simulacra? a counter-account of a and a+ GRI reports. *Accounting, Auditing & Accountability Journal*, *26*(7), 1036–1071. https://doi.org/10.1108/AAAJ-04-2012-00998

Bourne, E., Schlich, B.-L., & Dodsworth, C. (2024). Made to Measure: Indicator Construction and Measurement Scales in ESG Score Design. *The Journal of Impact and ESG Investing*, *5*(1), 148–175. https://doi.org/10.3905/jesg.2024.1.108

Brander, M., & Bjørn, A. (2023). Principles for accurate GHG inventories and options for market-based accounting. *The International Journal of Life Cycle Assessment*, *28*(10), 1248–1260. https://doi.org/10.1007/s11367-023-02203-8

Brander, M., Hoepner, A. G. F., Rogelj, J., Saini, T., & Schneider, F. (2023). Corporate carbon disclosure: A critical review. https://doi.org/10.2139/ssrn.4429430

Brown, H. S., De Jong, M., & Levy, D. L. (2009). Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. *Journal of Cleaner Production*, *17*(6), 571–580. https://doi.org/10.1016/j.jclepro.2008.12.009

Callery, P. J., & Perkins, J. (2021). Detecting false accounts in intermediated voluntary disclosure. *Academy of Management Discoveries*, *7*(1), 40–56. https://doi.org/10.5465/amd.2018.0229

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., . . . Péan, C. (2023, July). *IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland.* (tech. rep.). Intergovernmental Panel on Climate Change (IPCC). https://doi.org/10.59327/IPCC/AR6-9789291691647

Capizzi, V., Gioia, E., Giudici, G., & Tenca, F. (2021). The divergence of esg ratings: An analysis of italian listed companies. *Journal of Financial Management, Markets and Institutions*, *09*(02), 2150006. https://doi.org/10.1142/S2282717X21500067

CDP. (2024a). *CDP corporate data.* Retrieved August 26, 2024, from https://www.cdp.net/en/data/corporate-data

CDP. (2024b). *CDP europe income and expenditure - CDP.* Retrieved September 17, 2024, from https://www.cdp.net/en/info/finance/europe

CDP. (2024c). *CDP scores explained - CDP.* Retrieved September 17, 2024, from https://www.cdp.net/en/scores/cdp-scores-explained

Chatterji, A., Durand, R., Levine, D. I., & Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal*, *37*(8), 1597–1614. https://doi.org/10.1002/smj.2407

Chatterji, A., & Levine, D. (2006). Breaking down the wall of codes: Evaluating non-financial performance measurement. *California Management Review*, *48*(2), 29–51. https://doi.org/10.2307/41166337

Chen, Z. (2025). Developing a Global ESG Rating System: Challenges, Strategies, and Future Prospects. *Financial Economics Research*, *2*(1), 1–10. https://doi.org/10.70267/jacs1v36

Christensen, D. M., Serafeim, G., & Sikochi, A. (2022). Why is corporate virtue in the eye of the beholder? the case of ESG ratings. *The Accounting Review*, *97*(1), 147–175. https://doi.org/10.2308/TAR-2019-0506

Christofi, A., Christofi, P., & Sisaye, S. (2012). Corporate sustainability: Historical development and reporting practices. *Management Research Review*, *35*(2), 157–172. https://doi.org/10.1108/01409171211195170

Climate Action 100. (2023, October). *Climate action 100+ net zero company benchmark disclosure framework assessment methodology v2.0 - 2023.* Climate Action 100. Retrieved September 19, 2024, from https://www.climateaction100.org/wp-content/uploads/2023/10/CA100-Benchmark-2.0-Disclosure-Framework-Methodology-Confidential-October-2023.pdf

Climate Action 100. (2024). *Methodologies.* Retrieved September 19, 2024, from https://www.climateaction100.org/net-zero-company-benchmark/methodology/

Climate Action 100+. (2024). *About climate action 100+.* Retrieved September 19, 2024, from https://www.climateaction100.org/about/

Corporate Accountability. (2024a). *Annual report 2023.* Retrieved September 17, 2024, from https://corporateaccountability.org/annualreport2023/

Corporate Accountability. (2024b). *Vote in this year's corporate hall of shame!* Retrieved September 17, 2024, from https://corporateaccountability.org/chosfy25/

Corporate Knights Inc. (2024a). *The 2025 global 100 : Overview of corporate knights rating methodology.* Corporate Knights Inc. Retrieved September 20, 2024, from https://www.corporateknights.com/wp-content/uploads/2024/07/2025-Global-100-Methodology.pdf

Corporate Knights Inc. (2024b, January 17). *The 100 most sustainable companies of 2024.* Retrieved September 20, 2024, from https://www.corporateknights.com/rankings/global-100-rankings/2024-global-100-rankings/the-20th-annual-global-100/

Deb, R., & Behra, A. (2024). Composite or Component-wise ESG Reporting: A Tangle. *Metamorphosis: A Journal of Management Research.* https://doi.org/10.1177/09726225241264618

Delmas, M., & Blass, V. D. (2010). Measuring corporate environmental performance: The trade-offs of sustainability ratings. *Business Strategy and the Environment*, *19*(4), 245–260. https://doi.org/10.1002/bse.676

Diez-Cañamero, B., Bishara, T., Otegi-Olaso, J. R., Minguez, R., & Fernández, J. M. (2020). Measurement of corporate social responsibility: A review of corporate sustainability indexes, rankings and ratings. *Sustainability*, *12*(5), 2153. https://doi.org/10.3390/su12052153

Direction générale du Trésor. (2021, February 18). *Rapport sur les labels RSE – accompagner les entreprises et donner confiance à leurs parties prenantes.* Retrieved May 16, 2024, from https://www.tresor.economie.gouv.fr/Articles/2021/02/18/rapport-sur-les-labels-rse-accompagner-les-entreprises-et-donner-confiance-a-leurs-parties-prenantes

Dobrick, J., Klein, C., & Zwergel, B. (2023). Size bias in refinitiv ESG data. *Finance Research Letters*, *55*, 104014. https://doi.org/10.1016/j.frl.2023.104014

Doyle, T. (2018, August 7). *Ratings that don't rate: The subjective world of ESG ratings agencies.* Retrieved August 5, 2024, from https://corpgov.law.harvard.edu/2018/08/07/ratings-that-dont-rate-the-subjective-world-of-esg-ratings-agencies/

Dragomir, V. D. (2012). The disclosure of industrial greenhouse gas emissions: A critical assessment of corporate sustainability reports. *Journal of Cleaner Production*, *29-30*, 222–237. https://doi.org/10.1016/j.jclepro.2012.01.024

Drempetic, S., Klein, C., & Zwergel, B. (2020). The influence of firm size on the ESG score: Corporate sustainability ratings under review. *Journal of Business Ethics*, *167*(2), 333–360. https://doi.org/10.1007/s10551-019-04164-1

Ecovadis. (2024a). *Documents & links – EcoVadis help center.* Retrieved September 20, 2024, from https://support.ecovadis.com/hc/en-us/sections/115000159887-Documents-Links

Ecovadis. (2024b). *EcoVadis carbon methodology overview and principles.* Retrieved September 26, 2024, from https://resources.ecovadis.com/ecovadis-solution-materials/ecovadis-carbon-methodology-overview-principles

Ecovadis. (2024c). *EcoVadis CSR rating methodology: Scoring principles.* Retrieved September 20, 2024, from https://resources.ecovadis.com/ecovadis-solution-materials/csr-rating-methodology-scoring-principles

Ecovadis. (2024d). *Plans and pricing.* Retrieved September 23, 2024, from https://ecovadis.com/plans-pricing/

Ecovadis. (2024e, February 17). *What is the carbon rating methodology? how is the carbon rating result calculated?* Retrieved September 26, 2024, from https://support.ecovadis.com/hc/en-us/articles/17031370145554-What-is-the-Carbon-Rating-methodology-How-is-the-Carbon-Rating-result-calculated

Ecovadis. (2024f, July 18). *Understanding EcoVadis medals and badges.* Retrieved September 20, 2024, from https://support.ecovadis.com/hc/en-us/articles/210460227-Understanding-EcoVadis-Medals-and-Badges

Edouard, F., & Esther, S. (2023, December). *ACT - assessing low-carbon transition generic v2.0.* ADEME. Retrieved February 28, 2025, from https://actinitiative.org//wp-content/uploads/pdf/act_generic_methodology_v2.0.pdf

Environmental Resources Management. (2021). *Study on sustainability-related ratings, data and research.* Retrieved August 5, 2024, from https://data.europa.eu/doi/10.2874/14850

Escrig-Olmedo, E., Fernández-Izquierdo, M. Á., Ferrero-Ferrero, I., Rivera-Lirio, J. M., & Muñoz-Torres, M. J. (2019). Rating the raters: Evaluating how ESG rating agencies integrate sustainability principles. *Sustainability*, *11*(3), 915. https://doi.org/10.3390/su11030915

Escrig-Olmedo, E., Muñoz-Torres, M., & Fernandez-Izquierdo, M. (2010). Socially responsible investing: Sustainability indices, ESG rating and information provider agencies. *International Journal of Sustainable Economy*, *2*, 442–461. https://doi.org/10.1504/IJSE.2010.035490

Escrig-Olmedo, E., Muñoz-Torres, M. J., Fernández-Izquierdo, M. Á., & Rivera-Lirio, J. M. (2014). Lights and shadows on sustainability rating scoring. *Review of Managerial Science*, *8*(4), 559–574. https://doi.org/10.1007/s11846-013-0118-0

ESG Data and Ratings Working Group (DRWG). (2023, December). *Code of conduct for ESG Ratings and Data Products Providers.* IRSG and ICMA. Retrieved December 9, 2024, from https://www.icmagroup.org/assets/DRWG-Code-of-Conduct-for-ESG-Ratings-and-Data-Products-Providers-v3.pdf

European Commission. (2024, June). Corporate sustainability reporting - European Commission. Retrieved June 24, 2024, from https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

European Commission and Copernicus and ECMWF. (2025, October). *Global Climate Highlights 2024 - The 2024 annual climate summary.* European Union. Retrieved October 1, 2025, from https://climate.copernicus.eu/global-climate-highlights-2024

Fichtner, J., Jaspert, R., & Petry, J. (2024). Mind the ESG capital allocation gap: The role of index providers, standard-setting, and "green" indices for the creation of sustainability impact. *Regulation & Governance*, *18*(2), 479–498. https://doi.org/10.1111/rego.12530

FitchRatings. (2020, October 8). *Utilities - long term ESG vulnerability scores.* FitchRatings. Retrieved September 24, 2024, from https://www.fitchratings.com/research/corporate-finance/utilities-long-term-esg-vulnerability-scores-08-10-2020

FitchRatings. (2021, April 13). *ESG in credit – GHG and air quality issues.* FitchRatings. Retrieved September 24, 2024, from https://www.fitchratings.com/research/infrastructure-project-finance/esg-in-credit-ghg-air-quality-issues-13-04-2021?FR_Web-Validation=true&mkt_tok=NzMyLUNLSC03NjcAAAGVwmEgO xe9m8modO2Qt9Hyv7jpRxIkN55uKOeASWZsPFkgw8c-uMuktyFsSGX-EVwx-MRdeDd3S5gzNwM5tjRWd-XXfMWEaaOOImRysxYuDA

Fonseca, A., McAllister, M. L., & Fitzpatrick, P. (2014). Sustainability reporting among mining corporations: A constructive critique of the GRI approach. *Journal of Cleaner Production*, *84*, 70–83. https://doi.org/10.1016/j.jclepro.2012.11.050

France Stratégie. (2024). *Labels RSE. Propositions pour des labels RSE sectoriels destinés aux TPE, PME et ETI.* Retrieved May 17, 2024, from https://www.strategie.gouv.fr/publications/labels-rse-propositions-labels-rse-sectoriels-destines-aux-tpe-pme-eti

FTSE Russell. (2023). *ESG scores and data model - integrating ESG into investments.* FTSE Russell. Retrieved September 24, 2024, from https://www.lseg.com/content/dam/ftse-russell/en_us/documents/other/ftse-esg-scores-overview-2023.pdf

FTSE Russell. (2024, June). *FTSE russell ESG data model methodology.* FTSE Russell. Retrieved September 24, 2024, from https://www.lseg.com/content/dam/ftse-russell/en_us/documents/policy-documents/ftse-russell-esg-data-model-methodology.pdf

Gibson Brandon, R., Krueger, P., & Schmidt, P. S. (2021). ESG rating disagreement and stock returns. *Financial Analysts Journal*, *77*(4), 104–127. https://doi.org/10.1080/0015198X.2021.1963186

González-Pozo, R., Arenas-Parra, M., Quiroga-García, R., & Bilbao-Terol, A. (2024). A proposal for refining the ESG methodology used by rating agencies. *International Transactions in Operational Research.* https://doi.org/10.1111/itor.13550

Gupta, J., R, S., & Li, X. (2025). Are Developing Country Firms Getting the Short End of the ESG Stick? https://doi.org/10.2139/ssrn.4918163

Gyönyörová, L., Stachoň, M., & Stašek, D. (2023). ESG ratings: Relevant information or misleading clue? Evidence from the S&P Global 1200. *Journal of Sustainable Finance & Investment*, *13*(2), 1075–1109. https://doi.org/10.1080/20430795.2021.1922062

Inrate. (2024a). *Frequently asked questions on inrate.* Retrieved September 24, 2024, from https://inrate.com/faqs/

Inrate. (2024b). *Methodology.* Retrieved September 24, 2024, from https://inrate.com/methodology/

Insights Investment. (2024a). *Prime climate risk ratings | insight investment.* Retrieved September 25, 2024, from https://www.insightinvestment.com/investing-responsibly/insight-prime/prime-climate-risk-ratings/

Insights Investment. (2024b). *Prime corporate ESG ratings | insight investment.* Retrieved September 25, 2024, from https://www.insightinvestment.com/investing-responsibly/insight-prime/prime-corporate-esg-ratings/

Insights Investment. (2024c, April). *Prime insight's corporate ESG ratings*. Insight Investment. Retrieved September 25, 2024, from https://www.insightinvestment.com/globalassets/documents/responsible-investment/responsible-investment-reports/prime-insights-corporate-esg-ratings.pdf

Insights Investment. (2024d, May). *Introducing insight's prime climate risk ratings*. Retrieved September 25, 2024, from https://www.insightinvestment.com/globalassets/documents/responsible-investment/responsible-investment-reports/uk-eu-introducing-insights-prime-climate-risk-ratings.pdf

ISS ESG. (2023, September). *ESG corporate rating - methodology and research process - iss esg report*. Retrieved September 25, 2024, from https://www.issgovernance.com/file/products/iss-esg-corporate-rating-methodology.pdf

ISS ESG. (2024a, September). *Carbon risk rating - ISS ESG brochure*. Retrieved September 25, 2024, from https://www.issgovernance.com/file/products/brochure-esg-carbon-risk-rating.pdf?utm_campaign=ESG%20Climate%20Solutions%20Global&utm_medium=email&_hsenc=p2ANqtz--KAQagffhaWPNcCK2-8jpLBETD9Y-NKhQvTAh8CwJ_f3GnWlLIHROeNK5mwJ1XxcYSMJ0FXWH0jkoVq7zrv4u_hsmi=222370182&utm_content=222370182&utm_source=hs_automation

ISS ESG. (2024b, September). *Climate & nature solutions product guide*. Retrieved September 25, 2024, from https://www.issgovernance.com/file/products/brochure-esg-product-guide-climate-solutions.pdf?utm_medium=email&_hsenc=p2ANqtz-_jW9_q3QoMQsDu34e47MHuWLY2or6dU91mW-p3gFj3sXpGcJhdM0TbdNHN7CPmwMj7mz_jOOSrl2HVeMxeU3fyP7pe-61u8zWuNSRATW9vvl0zxoM&_hsmi=319848293&utm_content=319848293&utm_source=hs_automation

ISS ESG. (2024c, September). *ESG ratings & rankings product guide - ISS ESG*. Retrieved September 25, 2024, from https://www.issgovernance.com/file/products/brochure-esg-product-guide-ratings-and-rankings.pdf?utm_medium=email&_hsenc=p2ANqtz-_vrtqFrQgIGY4SNXE0wj-Z_lfdo_GNNzJGhPPRmQXzABZRGbSSSKH6s-vln4YGDGV_x3yTEURT19r2eucMZ42WyoOcNok3pnw0N0PlX_Oz71l27aA&_hsmi=319850714&utm_content=319850714&utm_source=hs_automation

Jankalová, M., & Jankal, R. (2017). The assessment of corporate social responsibility: Approaches analysis. *Entrepreneurship and Sustainability Issues*, *4*(4), 441–459. https://doi.org/10.9770/jesi.2017.4.4(4)

JUST Capital. (2024a). *FAQ*. Retrieved September 25, 2024, from https://justcapital.com/about/faq/

JUST Capital. (2024b, February). *JUST capital ranking methodology*. JUST Capital. Retrieved September 25, 2024, from https://com-justcapital-web-v2.s3.amazonaws.com/pdf/JUST_Capital_2024_Rankings_Methodology_01112024.pdf

Klaaßen, L., & Stoll, C. (2021). Harmonizing corporate carbon footprints. *Nature Communications*, *12*(1), 6149. https://doi.org/10.1038/s41467-021-26349-x

Kolk, A., Levy, D., & Pinkse, J. (2008). Corporate Responses in an Emerging Climate Regime: The Institutionalization and Commensuration of Carbon Disclosure. *European Accounting Review*, *17*(4), 719–745. https://doi.org/10.1080/09638180802489121

Kotsantonis, S., & Serafeim, G. (2019). Four things no one will tell you about ESG data. *Journal of Applied Corporate Finance*, *31*(2), 50–58. https://doi.org/10.1111/jacf.12346

Leiserowitz, A., Mailbach, E., Rosenthal, S., Kotcher, J., Ballew, M., Goldberd, M., & Gustafson, A. (2018, December). *Climate Change in the American Mind: December 2018* (tech. rep.). Yale University and George Mason University. New Haven. Retrieved May 23, 2024, from https://climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-december-2018/

Li, J., & Xu, X. (2024). Can ESG rating reduce corporate carbon emissions? – An empirical study from Chinese listed companies. *Journal of Cleaner Production*, *434*, 140226. https://doi.org/10.1016/j.jclepro.2023.140226

LSEG. (2023, December). *Environmental, social and governance scores from LSEG*. London Stock Exchange Group. London. Retrieved August 27, 2024, from https://www.lseg.com/content/dam/data-analytics/en_us/documents/methodology/lseg-esg-scores-methodology.pdf

Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, *28*(2), 223–249. https://doi.org/10.1177/1086026615575332

Mackenzie, C., Rees, W., & Rodionova, T. (2013). Do responsible investment indices improve corporate social responsibility? FTSE4good's impact on environmental management. *Corporate Governance: An International Review*, *21*(5), 495–512. https://doi.org/10.1111/corg.12039

Magnusson Rauf, L. (2023). *Beyond the Surface: A Comprehensive Look into Swedish Companies'; Scope 3 Greenhouse Gas Emission Assessments* [Master's thesis, Upsalla universitet]. Retrieved August 24, 2023, from https://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-503995

Matthews, H. S., Hendrickson, C. T., & Weber, C. L. (2008). The Importance of Carbon Footprint Estimation Boundaries. *Environmental Science & Technology*, *42*(16), 5839–5842. https://doi.org/10.1021/es703112w

Moneva, J. M., Archel, P., & Correa, C. (2006). GRI and the camouflaging of corporate unsustainability. *Accounting Forum*, *30*(2), 121–137. https://doi.org/10.1016/j.accfor.2006.02.001

Mooij, S. (2017). The ESG initiative industry; vice or virtue in the adoption of responsible investment? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2960869

Morningstar / Sustainalytics. (2023). *Physical climate risk metrics - methodology abstract*. Morningstar / Sustainalytics. Retrieved August 22, 2024, from https://connect.sustainalytics.com/hubfs/INV/Climate%20Solutions/Physical%20Risk%20MVP/Sustainalytics%20Physical%20Climate%20Risk%20Metrics%20Brochure.pdf

Morningstar / Sustainalytics. (2024a). *ESG risk rating license*. Morningstar / Sustainalytics. Retrieved August 22, 2024, from https://connect.sustainalytics.com/hubfs/SCS/SFS%20-%20ESG%20Risk%20Ratings/ESG%20Risk%20Rating%20License%202.0.pdf

Morningstar / Sustainalytics. (2024b, February). *Low carbon transition rating version 1.3*. Morningstar / Sustainalytics. Retrieved August 22, 2024, from https://connect.sustainalytics.com/hubfs/INV/Climate%20Solutions/Low%20Carbon%20Transition%20Ratings/Sustainalytics%20-%20Low%20Carbon%20Transition%20Rating%20-%20Methodology%20Abstract.pdf

Morningstar / Sustainalytics. (2024c, June). *The ESG risk ratings - methodology abstract version 3.1*. Morningstar/Sustainalytics. Retrieved August 22, 2024, from https://connect.sustainalytics.com/hubfs/INV/ESG%20Risk%20Ratings/ESG%20Risk%20Ratings%20Methodology%20Abstract.pdf

MSCI ESG Research. (2020). *MSCI ESG fixed income solutions*. MSCI. Retrieved September 3, 2024, from https://www.msci.com/documents/1296102/20673217/ESG-FixedIncomeSolutions-cfs-en.pdf/4b35931f-b8a7-a0a2-d5f3-8d69c23d2b21

MSCI ESG Research. (2021, September). *Implied temperature rise methodology*. MSCI. Retrieved September 3, 2024, from https://www.msci.com/documents/1296102/27422075/Implied-Temperature-Rise-Methodology-Summary.pdf

MSCI ESG Research. (2023, February). *MSCI ESG general FAQs for corporate issuers*. MSCI. Retrieved August 22, 2024, from https://www.msci.com/documents/1296102/10259127/FAQ-For-Corporate-Issuers.pdf

MSCI ESG Research. (2024a). *ESG ratings & climate search tool*. Retrieved September 25, 2024, from https://www.msci.com/our-solutions/esg-investing/esg-ratings-climate-search-tool

MSCI ESG Research. (2024b, April). *ESG ratings methodology*. MSCI. Retrieved September 3, 2024, from https://www.msci.com/documents/1296102/34424357/MSCI+ESG+Ratings+Methodology.pdf

MSCI ESG Research. (2024c, April). *ESG ratings process*. MSCI. Retrieved September 25, 2024, from https://www.msci.com/documents/1296102/34424357/MSCI+ESG+Ratings+Methodology+-+Process.pdf/820e4152-4804-fe33-0a67-8ee4c6a8fd7d?t=1666300410683

Muñoz, D. R., & Smoleńska, A. (2023, August 4). The governance of ESG ratings and benchmarks (infomediaries) as gatekeepers: Exit, voice and coercion. https://doi.org/10.2139/ssrn.4531520

Nikolaou, I. E., & Tsalis, T. (2018). A framework to evaluate eco- and social-labels for designing a sustainability consumption label to measure strong sustainability impact of firms/products. *Journal of Cleaner Production*, *182*, 105–113. https://doi.org/10.1016/j.jclepro.2018.02.042

OECD. (2020, September). *ESG Investing: Environmental Pillar Scoring and Reporting*. https://doi.org/10.1787/80680dc8-en

OECD. (2022, June). *ESG ratings and climate transition: An assessment of the alignment of E pillar scores and metrics* (OECD Business and Finance Policy Papers No. 06). https://doi.org/10.1787/2fa21143-en

Patara, S., & Dhalla, R. (2022). Sustainability reporting tools: Examining the merits of sustainability rankings. *Journal of Cleaner Production*, *366*, 132960. https://doi.org/10.1016/j.jclepro.2022.132960

Peng, X., Li, J., Tang, Q., Lan, Y.-C., & Cui, X. (2024). Do environmental scores become multinational corporations' strategic "greenwashing" tool for window-dressing carbon reduction? A cross-cultural

analysis. *Business Strategy and the Environment*, *33*(3), 2084–2115. https://doi.org/10.1002/bse.3586

Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011). Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change*, *21*(3), 1015–1024. https://doi.org/10.1016/j.gloenvcha.2011.03.001

RepRisk. (2023, December). RepRisk | Checklist for Singapore Code of Conduct for ESG Rating and Data Product Providers. Retrieved December 9, 2024, from https://www.reprisk.com/media/pages/static/3734730848-1733728270/annex-d-self-attestation-checklist-for-code-of-conduct-for-esg-rating-and-data-product-providers_reprisk.pdf

RepRisk. (2024a). *RepRisk | RepRisk methodology overview*. Retrieved August 27, 2024, from https://www.reprisk.com/news-research/resources/methodology

RepRisk. (2024b, December). RepRisk | RepRisk ESG Score configurator. Retrieved August 27, 2024, from https://www.reprisk.com/lab/jn/esg-score.html

RepRisk. (2024c, December). RepRisk | Transparency Commitment Charter. Retrieved September 12, 2024, from https://www.reprisk.com/lab/jn/esg-score.html

Reptrak. (2024). *Global reptrak 100 2024 report*. Reptrak. Retrieved August 27, 2024, from https://ri.reptrak.com/hubfs/2024%20Global%20RepTrak%20100/The%202024%20Global%20RepTrak%20100%20Report.pdf

Rossi, C., Byrne, J. G., & Christiaen, C. (2024). Breaking the ESG rating divergence: An open geospatial framework for environmental scores. *Journal of Environmental Management*, *349*, 119477. https://doi.org/10.1016/j.jenvman.2023.119477

Saadaoui, K., & Soobaroyen, T. (2017). An analysis of the methodologies adopted by CSR rating agencies. *Sustainability Accounting, Management and Policy Journal*, *9*(1), 43–62. https://doi.org/10.1108/SAMPJ-06-2016-0031

Sarasin, J. (2024). *Sustainable investment policy*. J.Safra Sarasin. Switzerland. Retrieved August 22, 2024, from https://www.jsafrasarasin.com/en/expertise/sustainable-investments.html

Sarkar, S., & Searcy, C. (2016). Zeitgeist or chameleon? a quantitative analysis of CSR definitions. *Journal of Cleaner Production*, *135*, 1423–1435. https://doi.org/10.1016/j.jclepro.2016.06.157

Schneider, L., & La Hoz Theuer, S. (2019). Environmental integrity of international carbon market mechanisms under the paris agreement. *Climate Policy*, *19*(3), 386–400. https://doi.org/10.1080/14693062.2018.1521332

Science Based Targets initiative. (2023). *SBTi Monitoring Report 2022* (tech. rep.). Retrieved June 11, 2024, from https://sciencebasedtargets.org/resources/files/SBTiMonitoringReport2022.pdf

Science Based Targets initiative. (2024a). *About us*. Retrieved August 26, 2024, from https://sciencebasedtargets.org/about-us

Science Based Targets initiative. (2024b). *How we are funded - science based targets initiative*. Retrieved May 17, 2024, from https://sciencebasedtargets.org/about-us/funders

Science Based Targets initiative. (2024c). Target dashboard - Science Based Targets Initiative. Retrieved June 11, 2024, from https://sciencebasedtargets.org/target-dashboard

Science Based Targets initiative. (2024d, March). SBTi Corporate Net-Zero Standard. Retrieved June 11, 2024, from https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf

Shanghai Huazheng Index Information Service Co. (2024a). *About us*. Retrieved August 27, 2024, from https://www-chindices-com.translate.goog/about.html?_x_tr_sl=zh-CN&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=sc#company_info

Shanghai Huazheng Index Information Service Co. (2024b). *Sino-securities index ESG ratings methodology v2.0*. SSI. Retrieved September 25, 2024, from https://www.chindices.com/files/Sino-Securities%20Index%20ESG%20Ratings%20Methodology.pdf

Shanghai Huazheng Index Information Service Co. (2024c, May). *Sino-Securities Index ESG Ratings Methodology V2.1* (tech. rep.). SSI. Retrieved September 12, 2024, from https://www.chindices.com/files/Sino-Securities+Index+ESG+Ratings+Methodology+V2.1.pdf

Shanghai Huazheng Index Information Service Co. translated by ChatGPT 4.0. (2024). *Translation of SSI's public methodology from mandarin chinese*. Retrieved August 27, 2024, from https://docs.google.com/document/u/0/d/1aHNhxwgibmR5C9qCozmicKIwW8rV0ZhSqCKhpXYKZIQ/edit?usp=embed_facebook

Siew, R. Y. J. (2015). A review of corporate sustainability reporting tools (SRTs). *Journal of Environmental Management*, *164*, 180–195. https://doi.org/10.1016/j.jenvman.2015.09.010

Sipiczki, A. (2022). *A critical look at the ESG market.* https://cdn.ceps.eu/wp-content/uploads/2022/04/PI2022-15_A-critical-look-at-the-ESG-market.pdf

Solactive AG German Index Engineering. (2024). *Explanation of how key elements of the benchmark methodology reflect environmental, social, and governance (ESG) factors.* Solactive AG German Index Engineering. Frankfurt am Main Germany. Retrieved August 27, 2024, from https://www.solactive.com/wp-content/uploads/solactiveip/en/ESG_Methodology_Statement_DE000SL0CAY0.pdf

S&P Global Inc. (2023, July). *Analytical Approach: Shades Of Green Assessments* (tech. rep.). S&P Global Inc. Retrieved December 9, 2024, from https://www.spglobal.com/ratings/en/research/articles/230727-analytical-approach-shades-of-green-assessments-12770725

S&P Global Inc. (2024a). *CSA handbook 2024 corporate sustainability assessment.* Retrieved August 27, 2024, from https://portal.s1.spglobal.com/survey/documents/CSA_Handbook.pdf

S&P Global Inc. (2024b). *Developing industry materiality matrices for the s&p global ESG scores.* Retrieved August 27, 2024, from https://www.spglobal.com/esg/insights/blog/developing-industry-materiality-matrices-for-the-sp-global-esg-scores

S&P Global Inc. (2024c). *S&p global ESG score.* Retrieved August 27, 2024, from https://www.spglobal.com/esg/solutions/esg-scores-data

S&P Global Inc. (2024d, March). *FAQ: Applying Our Integrated Analytical Approach For Climate Transition Assessments* (tech. rep.). S&P Global Inc. Retrieved December 9, 2024, from https://www.spglobal.com/ratings/en/research/articles/240718-faq-applying-our-integrated-analytical-approach-for-climate-transition-assessments-13169463

S&P Global Inc. (2024e, March). *S&p global ESG scores methodology.* S&P Global Inc. Retrieved August 27, 2024, from https://portal.s1.spglobal.com/survey/documents/spglobal_esg_scores_methodology.pdf

S&P Global Inc. (2024f, July). *Analytical Approach: Climate transition rating* (tech. rep.). S&P Global Inc. Retrieved December 9, 2024, from https://www.spglobal.com/ratings/en/research/articles/240718-analytical-approach-climate-transition-assessments-13157327

S&P Global Inc. (2024g, July). *Climate transition assessment featuring shades of green.* Retrieved September 3, 2024, from https://marketing.spglobal.com/CTA-Brochure

SustainAbility. (2023). *Rate the raters - latest reports.* Retrieved August 9, 2023, from https://www.sustainability.com/globalassets/sustainability.com/thinking/pdfs/2023/rate-the-raters-report-april-2023.pdf

Syntao Finance. (2024). *ESG rating methodology.* Retrieved August 22, 2024, from https://en.syntaogf.com/pages/methodology

Transparency and integrity of Environmental, Social and Governance rating activities (2024, April 24). Retrieved August 7, 2024, from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ%3AL_202403005

U.S. Securities and Exchange Commission. (2024, May). The enhancement and standardization of climate-related disclosures for investors. https://www.sec.gov/rules/final/2024/33-11275.pdf

Veenstra, E. M., & Ellemers, N. (2020). ESG Indicators as Organizational Performance Goals: Do Rating Agencies Encourage a Holistic Approach? *Sustainability*, *12*(24), 10228. https://doi.org/10.3390/su122410228

Wang, H., Jiao, S., Ge, C., & Sun, G. (2024). Corporate ESG rating divergence and excess stock returns. *Energy Economics*, *129*, 107276. https://doi.org/10.1016/j.eneco.2023.107276

Wegener, M., Labelle, R., & Jerman, L. (2019). Unpacking carbon accounting numbers: A study of the commensurability and comparability of corporate greenhouse gas emission disclosures. *Journal of Cleaner Production*, *211*, 652–664. https://doi.org/10.1016/j.jclepro.2018.11.156

Windolph, S. E. (2011). Assessing corporate sustainability through ratings: Challenges and their causes. *Journal of Environmental Sustainability*, *1*(1). https://doi.org/10.14448/jes.01.0005

Zha, G., Guo, T., Lee, C. L., & Tang, Q. (2020). Does corporate green ranking reflect carbon-mitigation performance? *Journal of Cleaner Production*, *277*, 123601. https://doi.org/10.1016/j.jclepro.2020.123601

Zürcher Kantonalbank / Swisscanto. (2024, February). *Swisscanto sustainability rating (white paper)*. Zürcher Kantonalbank. Zürich. Retrieved August 22, 2024, from https://www.zkb.ch/media/zkb/dokumente/asset-management/Brosch%C3%BCre_Sustainability_Rating_ESG-Integration_CH_EN.pdf

Supplementary material

Table 2: List of rating providers identified by our literature review. Raters are grouped according to the latest outcomes of mergers and acquisitions.

Actor	Mentioned by	Total mentions
MSCI / KLD / Innovest	Berg et al., 2019; Bernardini et al., 2024; Billio et al., 2021; Bourne et al., 2024; Capizzi et al., 2021; Chatterji and Levine, 2006; Chatterji et al., 2016; Chen, 2025; Christensen et al., 2022; Delmas and Blass, 2010; Diez-Cañamero et al., 2020; Doyle, 2018; Environmental Resources Management, 2021; Escrig-Olmedo et al., 2014, 2019; Fichtner et al., 2024; Gibson Brandon et al., 2021; González-Pozo et al., 2024; Gupta et al., 2025; Jankalová and Jankal, 2017; Mooij, 2017; OECD, 2020, 2022; Saadaoui and Soobaroyen, 2017; Siew, 2015; Sipiczki, 2022; SustainAbility, 2023; Veenstra and Ellemers, 2020; Windolph, 2011	30
SAM / S&P Global / Trucost	Berg et al., 2019; Bernardini et al., 2024; Billio et al., 2021; Bourne et al., 2024; Capizzi et al., 2021; Chatterji and Levine, 2006; Chatterji et al., 2016; Christofi et al., 2012; Delmas and Blass, 2010; Diez-Cañamero et al., 2020; Environmental Resources Management, 2021; Escrig-Olmedo et al., 2010, 2014, 2019; Jankalová and Jankal, 2017; Mooij, 2017; OECD, 2022; Rossi et al., 2024; Saadaoui and Soobaroyen, 2017; Siew, 2015; Sipiczki, 2022; SustainAbility, 2023; Windolph, 2011	23
Refinitiv / Asset4 / Thomson & Reuters / LSEG	Berg et al., 2019; Bernardini et al., 2024; Bourne et al., 2024; Capizzi et al., 2021; Chatterji and Levine, 2006; Chen, 2025; Christensen et al., 2022; Dobrick et al., 2023; Drempetic et al., 2020; Escrig-Olmedo et al., 2014, 2019; Gibson Brandon et al., 2021; González-Pozo et al., 2024; Gupta et al., 2025; Mooij, 2017; Muñoz and Smoleńska, 2023; OECD, 2020; Peng et al., 2024; Rossi et al., 2024; SustainAbility, 2023; Veenstra and Ellemers, 2020	22
MorningStar / Sustainanalytics	Arvidsson and Dumay, 2022; Berg et al., 2019; Bernardini et al., 2024; Billio et al., 2021; Capizzi et al., 2021; Christensen et al., 2022; Diez-Cañamero et al., 2020; Doyle, 2018; Environmental Resources Management, 2021; Escrig-Olmedo et al., 2014; Fichtner et al., 2024; Gibson Brandon et al., 2021; Gupta et al., 2025; Muñoz and Smoleńska, 2023; Rossi et al., 2024; Sipiczki, 2022; SustainAbility, 2023	18

Actor	Mentioned by	Total mentions
Moody's / Vigeo EIRIS	Berg et al., 2019; Billio et al., 2021; Capizzi et al., 2021; Chen, 2025; Diez-Cañamero et al., 2020; Environmental Resources Management, 2021; Escrig-Olmedo et al., 2010, 2014, 2019; González-Pozo et al., 2024; Gyönyörová et al., 2023; Mooij, 2017; Saadaoui and Soobaroyen, 2017; Siew, 2015; SustainAbility, 2023; Veenstra and Ellemers, 2020; Windolph, 2011	17
London Stock Exchange / FTSE Russel	Bourne et al., 2024; Chatterji and Levine, 2006; Chatterji et al., 2016; Diez-Cañamero et al., 2020; Escrig-Olmedo et al., 2010, 2014, 2019; Gibson Brandon et al., 2021; Jankalová and Jankal, 2017; Mackenzie et al., 2013; Muñoz and Smoleńska, 2023; Saadaoui and Soobaroyen, 2017; Siew, 2015; SustainAbility, 2023; Wang et al., 2024; Windolph, 2011	15
Bloomberg	Bernardini et al., 2024; Capizzi et al., 2021; Escrig-Olmedo et al., 2014; Fichtner et al., 2024; Gibson Brandon et al., 2021; Gupta et al., 2025; Muñoz and Smoleńska, 2023; OECD, 2020, 2022; Siew, 2015; Sipiczki, 2022; SustainAbility, 2023; Veenstra and Ellemers, 2020; Wang et al., 2024	14
ISS / Oekom	Bernardini et al., 2024; Diez-Cañamero et al., 2020; Doyle, 2018; Environmental Resources Management, 2021; Escrig-Olmedo et al., 2010, 2014, 2019; Muñoz and Smoleńska, 2023; Sipiczki, 2022; SustainAbility, 2023; Windolph, 2011	11
Carbon Disclosure Project	Bernardini et al., 2024; Brander et al., 2023; Callery and Perkins, 2021; Environmental Resources Management, 2021; Siew, 2015; Sipiczki, 2022; SustainAbility, 2023; Windolph, 2011; Zha et al., 2020	9
Fitch	Billio et al., 2021; Bourne et al., 2024; Environmental Resources Management, 2021; Muñoz and Smoleńska, 2023; SustainAbility, 2023	5
Corporate Knights	Diez-Cañamero et al., 2020; Patara and Dhalla, 2022; Windolph, 2011	3
EcoVadis	Diez-Cañamero et al., 2020; Muñoz and Smoleńska, 2023; SustainAbility, 2023	3
Ethibel	Diez-Cañamero et al., 2020; Jankalová and Jankal, 2017; Windolph, 2011	3
Corporate Accountability	Escrig-Olmedo et al., 2014, 2019	2
Inrate	Capizzi et al., 2021; Gibson Brandon et al., 2021	2
JUST Capital	Patara and Dhalla, 2022; SustainAbility, 2023	2
RepRisk	Doyle, 2018; SustainAbility, 2023	2
Solactive	Diez-Cañamero et al., 2020; Jankalová and Jankal, 2017	2
SynTao Green Finance	Li and Xu, 2024; Wang et al., 2024	2

Actor	Mentioned by	Total mentions
3BL Media	Patara and Dhalla, 2022	1
Bank Sarasin & Co Ltd.	Windolph, 2011	1
Broadridge	Fichtner et al., 2024	1
Calvert	Chatterji and Levine, 2006	1
ECPI	Diez-Cañamero et al., 2020	1
RepTrak	Diez-Cañamero et al., 2020	1
Sensefolio	Muñoz and Smoleńska, 2023	1
Sino-securities index (SSI)	Wang et al., 2024	1
STOXX	Mooij, 2017	1
Wind	Wang et al., 2024	1
ZKB Sustainability Research	Windolph, 2011	1
ADEME ACT Solutions	*	0
BLab	*	0
Carbone 4	*	0
Climateaction100	*	0
Ethifinance	*	0
Insight Investment	*	0
Science Based Target initiative	*	0

Table 3: Table summarizing criticisms of reliability and accuracy in CSR scoring systems according to gray and scientific literature, along with criteria chosen to evaluate scoring providers on each issue. Criteria correspond to best-in-class practice observed among the scoring we scrutinized. Actors demonstrating best-in-class criteria can be identified using Table 5

Group	Issue Keyword	Issue	Best in Class Criterion	Sources
Reliability	Transparency	The scoring methodology is not transparent	Methodology is available in full online	Bernardini et al., 2024; Billio et al., 2021; Bourne et al., 2024; Callery and Perkins, 2021; Capizzi et al., 2021; Chatterji et al., 2016; Direction générale du Trésor, 2021; Escrig-Olmedo et al., 2019; Fonseca et al., 2014; González-Pozo et al., 2024; Jankalová and Jankal, 2017; Muñoz and Smoleńska, 2023; OECD, 2020, 2022; Patara and Dhalla, 2022; Saadaoui and Soobaroyen, 2017; Sipiczki, 2022; SustainAbility, 2023; Transparency and integrity of Environmental, Social and Governance rating activities, 2024; Windolph, 2011
Reliability	Independency	Raters are not independent financially from rated companies	There are no financial ties between rater and rated companies	Billio et al., 2021; Direction générale du Trésor, 2021; Jankalová and Jankal, 2017; Kotsantonis and Serafeim, 2019; Muñoz and Smoleńska, 2023; Patara and Dhalla, 2022; Sipiczki, 2022; Transparency and integrity of Environmental, Social and Governance rating activities, 2024; Windolph, 2011
Reliability	Standardization	Input information used is subjective and not standardized	The rating systems uses quantitative, standard-backed data points	Billio et al., 2021; Bourne et al., 2024; Callery and Perkins, 2021; Capizzi et al., 2021; Chen, 2025; Jankalová and Jankal, 2017; Kotsantonis and Serafeim, 2019; Muñoz and Smoleńska, 2023; OECD, 2020; Patara and Dhalla, 2022; Sipiczki, 2022; SustainAbility, 2023; Transparency and integrity of Environmental, Social and Governance rating activities, 2024; Windolph, 2011

Group	Issue Keyword	Issue	Best in Class Criterion	Sources
Reliability	Verification	Input information is not verified in the rating process	Input information is verified by requesting supporting documents	Bernardini et al., 2024; Billio et al., 2021; Callery and Perkins, 2021; Escrig-Olmedo et al., 2014; Muñoz and Smoleńska, 2023; Patara and Dhalla, 2022; Sipiczki, 2022; SustainAbility, 2023; Windolph, 2011
Accuracy	Weighting	Raters choose arbitrary weightings for the issues covered	Scoring does not require weighting or uses a transparent science-based weighting	Bernardini et al., 2024; Billio et al., 2021; Bourne et al., 2024; Capizzi et al., 2021; Chatterji et al., 2016; Chen, 2025; Escrig-Olmedo et al., 2010, 2014, 2019; Moneva et al., 2006; Muñoz and Smoleńska, 2023; Nikolaou and Tsalis, 2018; OECD, 2020; Saadaoui and Soobaroyen, 2017; Windolph, 2011
Accuracy	Compensation	Rated companies have the possibility to compensate for low scores on some criteria	Companies cannot compensate failing on categories by performing well on others	Billio et al., 2021; Deb and Behra, 2024; Escrig-Olmedo et al., 2010, 2014, 2019; France Stratégie, 2024; OECD, 2020; Windolph, 2011
Accuracy	Relativity	Rating is relative and does not take into account planetary boundaries	Rating compares corporate performance with planetary boundaries	Chatterji and Levine, 2006; Escrig-Olmedo et al., 2019; Fonseca et al., 2014; Nikolaou and Tsalis, 2018; OECD, 2020, 2022
Accuracy	Immateriality	Raters focus on immaterial ESG aspects	Criteria are justified by a materiality assessment	Bernardini et al., 2024; France Stratégie, 2024; González-Pozo et al., 2024; Muñoz and Smoleńska, 2023; SustainAbility, 2023; Transparency and integrity of Environmental, Social and Governance rating activities, 2024
Accuracy	Impact	Ratings are based on disclosure and impact management and not negative impact magnitude	Rating takes into account levels negative impact	CSR issues and failing to assess the magnitude of externalities Delmas and Blass, 2010; Jankalová and Jankal, 2017; Muñoz and Smoleńska, 2023; OECD, 2020, 2022; Peng et al., 2024
Accuracy	Forward look	Ratings are based mostly on backwards looking information and do not consider future results	Rating projects future evolution of corporate performance	Fonseca et al., 2014; Moneva et al., 2006

Group	Issue Keyword	Issue	Best in Class Criterion	Sources
Accuracy	Stakeholders	Stakeholders' opinions are not properly taken into account in the rating	A representative selection of all company stakeholders are solicited in the rating process	Diez-Cañamero et al., 2020; Escrig-Olmedo et al., 2019; Fonseca et al., 2014; Veenstra and Ellemers, 2020
Accuracy	Sector exclusion	Controversial sectors are not excluded from rated companies	A list of controversial sectors is excluded	Drempetic et al., 2020; Patara and Dhalla, 2022; Saadaoui and Soobaroyen, 2017
Accuracy	Value chain	Raters focus on company performance rather than reflecting at the value chain level	Criteria include impacts in the company's value chain	Escrig-Olmedo et al., 2019; Fonseca et al., 2014; Moneva et al., 2006
Accuracy	Regulation	Rating criteria do not go beyond regulation	At least one criterion is more ambitious than what is mandated by regulation applicable	France Stratégie, 2024
Fairness	Specificity	Method does not take into account company size, activity, geography resulting in bias	Approach takes into account at least company size, activity, or geography	Chen, 2025; Direction générale du Trésor, 2021; Dobrick et al., 2023; Drempetic et al., 2020; France Stratégie, 2024; Gupta et al., 2025; Gyönyörová et al., 2023; Kotsantonis and Serafeim, 2019; Muñoz and Smoleńska, 2023; Patara and Dhalla, 2022; Rossi et al., 2024; Sipiczki, 2022; Transparency and integrity of Environmental, Social and Governance rating activities, 2024; Windolph, 2011
Fairness	*	Companies with a good performance on one criterion get less sharply scrutinized on the other criteria	*Impossible to assess without access to the company input data*	Berg et al., 2019
Effectiveness	Progress	Companies are not expected to make progress year-on-year in order to retain the same rating	Criteria are made progressively more ambitious every year	Direction générale du Trésor, 2021; France Stratégie, 2024; Moneva et al., 2006

Group	Issue Keyword	Issue	Best in Class Criterion	Sources
Effectiveness	Support	Rating process does not entail support to drive improvement at rated companies	Rated companies are offered documentation on how to meet criteria	Direction générale du Trésor, 2021; Transparency and integrity of Environmental, Social and Governance rating activities, 2024

Table 4: List of sources used for the analysis, and contacts sent out to scoring companies. In cases where the Actor responded, their response and the reason for contact are given under the column headed "Contact and Response". The table presents the scoring system, relevant documentation or sources, and any additional contact or response information for each actor.

Actor	Score	Source	Contact/Response
3BL Media	100 Best Corporate Citizens	3BL, 2024a, 2024b	Actor contacted to review their assessment. No response.
ADEME ACT Solutions	ACT rating	ADEME, 2025; Edouard and Esther, 2023	Agency contacted to review their assessment. The agency's response has been integrated in the final assessment and can be read in the detailed assessment (Tables 7, 8, 9 and 10).
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	MSCI ESG Research, 2023; Sarasin, 2024	Actor contacted to review their assessment. No response.
BLab	B Corp Label	B Lab, 2024a, 2024b, 2024c	Actor contacted to review their assessment. No response.
Bloomberg	ESG Score	Bloomberg Professional Services, 2024a, 2024c	Actor contacted as there was too little publicly-available information to assess their methodology. After discussing the purpose of the research and the focal assessment criteria, the Actor shared 2 proprietary methodologies. The rater further provided feedback on its assessments. The feedback is included in tables 7, 8, 9 and 10.
	UN SDG Impact materiality	Bloomberg Professional Services, 2024a, 2024c	Actor contacted as there was too little publicly-available information to assess their methodology. After discussing the purpose of the research and the focal assessment criteria, the Actor shared 2 proprietary methodologies. The rater further provided feedback on its assessments. The feedback is included in tables 7, 8, 9 and 10.

Continued on next page

Actor	Score	Source	Contact and Response
	Various	Bloomberg Professional Services, 2024a, 2024b, 2024c	Actor contacted as there was too little publicly-available information to assess their methodology. After discussing the purpose of the research and the focal assessment criteria, the Actor shared 2 proprietary methodologies. The rater further provided feedback on its assessments. The feedback is included in tables 7, 8, 9 and 10.
Broadridge			Actor contacted to ensure they offer no scoring system. No response.
Calvert			Actor contacted to ensure they offer no scoring system. No response.
Carbon Disclosure Project	CDP Climate Score	CDP, 2024a, 2024b, 2024c	Actor contacted to review their assessment. No response.
Carbone 4	Compatibility score with the Paris Agreement	Aboukrat et al., 2022	Actor contacted to review their assessment. No response.
	Carbon Impact Analytics		Actor contacted as there was too little publicly-available information to assess their methodology. No response.
Climateaction 100	Net Zero Actor Benchmark	Climate Action 100, 2023, 2024; Climate Action 100+, 2024	Actor contacted to review their assessment. The actor responded positively and requested a meeting, but stopped answering when discussing meeting scheduling.
Corporate Accountability	Corporate Hall of Shame	Corporate Accountability, 2024a, 2024b	Actor contacted to review their assessment. No response.
Corporate Knights	The Global 100 list	Corporate Knights Inc., 2024a, 2024b	Actor contacted to review their assessment. No response.
EcoVadis	Ecovadis Medals and Badges	Ecovadis, 2024a, 2024c, 2024d, 2024f	Actor contacted to review their assessment. No response.

Actor	Score	Source	Contact and Response
	Carbon rating	Ecovadis, 2024b, 2024e	Actor contacted to review their assessment. No response.
ECPI	ESG Rating		Actor contacted as available information is too scarce to assess their methodology. No response.
Ethibel			Actor contacted to ensure they offer no scoring system. No response.
Ethifinance	Various		Actor contacted as there was too little publicly-available information to assess their methodology. No response.
Fitch	ESG Vulnerability score	FitchRatings, 2020, 2021	Actor contacted as available information is too scarce to assess their methodology. No response.
FTSE Russel	FTSE ESG Scores	FTSE Russell, 2023, 2024	Actor contacted to review their assessment. The Actor answered they would look into it, but never got back to us.
Inrate	ESG impact ratings	Inrate, 2024a, 2024b	Actor contacted to review their assessment. The actor responded positively and requested a meeting, but broke contact when we started to talk about scheduling a meeting.
Insight Investment	Prime climate risk ratings	Insights Investment, 2024a, 2024d	Actor contacted to review their assessment. No response.
	Prime ESG ratings	Insights Investment, 2024b, 2024c	Actor contacted to review their assessment. No response.
ISS / Oekom	ESG Corporate Rating	ISS ESG, 2023, 2024c	Actor contacted to review their assessment. The Actor declined to participate further.
	Carbon Risk Rating	ISS ESG, 2024a, 2024b	Actor contacted to review their assessment. The Actor declined to participate further.

Actor	Score	Source	Contact and Response
JUST Capital	Annual JUST Capital Corporation Ranking	JUST Capital, 2024a, 2024b	Actor contacted to review their assessment. No response.
Moody's / Vigeo EIRIS	ESG Risk Score		Actor contacted as available information is too scarce to assess their methodology. The Actor responsed ESG ratings are to be discontinued following a partnership with MSCI.
	Climate Risk Score		Actor contacted as available information is too scarce to assess their methodology. The Actor responsed ESG ratings are to be discontinued following a partnership with MSCI.
MorningStar / Sustainalytics	Low Carbon Transition Rating	Morningstar / Sustainalytics, 2024b	Actor contacted to review their assessment. The actor responded to our inquiry by providing links to documents we had previously accessed.
	ESG Risk Rating	Morningstar / Sustainalytics, 2024a, 2024c	Actor contacted to review their assessment. The actor responded to our inquiry by providing links to documents we had previously accessed.
	Physical Risk Rating	Morningstar / Sustainalytics, 2023	Actor contacted to review their assessment. The actor responded to our inquiry by providing links to documents we had previously accessed.
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	MSCI ESG Research, 2020, 2021, 2024a	Actor contacted to review their assessment. No response.
	MSCI ESG Rating	MSCI ESG Research, 2024a, 2024b, 2024c	Actor contacted to review their assessment. No response.
Refinitiv / Asset4 / Thomson & Reuters / LSEG	ESG Score	LSEG, 2023	Actor contacted to review their assessment. No response.

Actor	Score	Source	Contact and Response
RepRisk	RepRisk Index	ESG Data and Ratings Working Group (DRWG), 2023; RepRisk, 2023, 2024a, 2024b, 2024c	Actor contacted to review the assessment of their methodology. The Actor provided sources ESG Data and Ratings Working Group (DRWG), 2023; RepRisk, 2023, 2024b, 2024c so that we could review our initial assessment. The documents were integrated in the final assessement as specified Tables (7, 8, 9 and 10).
RepTrak	ESG Perception & Global RepTrak 100	Reptrak, 2024	Actor contacted to review their assessment. No response.
SAM / S&P Global / Trucost	S&P Global ESG Score	S&P Global Inc., 2024a, 2024b, 2024c, 2024e	
	Climate Transition Assessment	S&P Global Inc., 2023, 2024d, 2024f, 2024g	Actor contacted as there was too little publicly-available information to assess their methodology. No response.
SBTi	Science Based Targets Labels	Science Based Targets initiative, 2023, 2024a, 2024b, 2024c, 2024d	
Sensefolio	Sensefolio ESG Framework		Actor contacted as there was too little publicly-available information to assess their methodology. No response.
Solactive	Solactive ISS ESG EU Paris-Aligned & Climate Transition Benchmarks	Solactive AG German Index Engineering, 2024	Actor contacted to confirm they offer no scoring system. No response.
SSI	ESG Rating	Shanghai Huazheng Index Information Service Co., 2024a, 2024b, 2024c	Actor reviewed the initial assessment, and provided the latest version of their methodology brochure. Rater's response has been integrated in the final assessment and can be read in the detailed assessment (Tables 7, 8, 9 and 10).

Actor	Score	Source	Contact and Response
	Carbon Neutrality Rating	Shanghai Huazheng Index Information Service Co. translated by ChatGPT 4.0, 2024	Actor reviewed the initial assessment, and provided its latest methodology description. Rater's response has been integrated in the final assessment and can be read in the detailed assessment Tables (7, 8, 9 and 10).
STOXX			Actor contacted to confirm they offer no scoring system. No response.
SynTao Green Finance	SynTao ESG Rating	Syntao Finance, 2024	Actor contacted to review their assessment. No response.
Wind			Actor contacted to confirm they offer no scoring system. No response.
ZKB Sustainability Research	Swisscanto Sustainability Rating	Zürcher Kantonalbank / Swisscanto, 2024	Actor contacted to review their assessment. No response.

Working Paper

Table 5: Review of scoring systems identified for each market actor. The table displays the score's name, type and focus. Ratings were identified by browsing the actors' official website. This table does not include actors for which no rating has been identified (Broadridge, Clavert, Ethibel, Solactive, STOXX, Wind). The information pertaining to scoringq for which no public documentation is available is left empty in this table (Carbone 4's Carbon Impact Analytics; ECPI's ESG Rating, Ethifinance's various unidentified ratings, Moody's / Vigeo EIRIS' ESG and climate risk score (discontinued in 2024)). Sources for each actors and scoring are available in Table 4.

Actor	Scoring Name	Climate specific	Type	Focus	Description
3BL Media	100 Best Corporate Citizens	No	Scoring & Ranking	Impact	The 100 Best Corporations is a corporate ESG ranking system. It relies on a scoring based on 7 pillars (Climate Change, Employees, Environment, Stakeholders and Society, Human rights, Governance).
ADEME ACT Solutions	ACT Rating	Yes	Scoring & Rating	Impact	The ACT rating assesses companies' alignment with a low-carbon transition using a three-part rating system: Performance Score (quantitative and qualitative evaluation of emissions, investments, and strategy), Narrative Score (qualitative assessment of the company's transition plan and credibility), and Trend Score (analysis of whether the company is expected in the near future to improve or regress in its transition efforts).

Actor	Scoring Name	Climate specific	Type	Focus	Description
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	No	Scoring & Rating	Risk	J. Safra Sarasin ESG Rating is a Corporate CSR score based on both a company-specific ESG score and an industry score. The assessment evaluates companies' ability to navigate ESG risks and opportunities relative to their industry. The final ranking aggregates both these scores to rank companies between Best in class to Worst-out universe.
BCorp	B Corp Label	No	Label	Impact	The BCorp assessment is an ESG Scoring system spanning across 5 categories: governance, workers, community, environment, and customers. Companies that reach a certain score become eligible for the BCorp label.
Bloomberg	ESG Score	No	Scoring	Risk	Bloomberg's ESG Score measures a company's management of financially material environmental, social, and governance issues.
Bloomberg	UN SDG Impact Materiality	No	Rating	Impact	The Bloomberg UN SDG Impact Materiality Methodology quantifies the potential positive and negative impacts of companies' activities on the 17 UN Sustainable Development Goals (SDGs). It calculates the share of a company's revenues that potentially impact each SDG, either positively or negatively.

Actor	Scoring Name	Climate specific	Type	Focus	Description
Bloomberg	Various, including 'Transition risk assessments, physical risk exposure indicators, and implied temperature rise metrics'				
Carbon Disclosure Project	CDP Climate Score	Yes	Scoring & Ranking	Impact	The CDP climate score provides a snapshot of yearly climate disclosure and management for companies that voluntarily respond to the CDP questionnaire.
Carbone 4	Compatibility score with the Paris Agreement	Yes	Rating	Impact	This indicator aims to measure the relevance of a product or service in a low-carbon world aligned with a 1.5°C or well below 2°C decarbonization pathway. Introduced in 2022, its application remains unclear.
Carbone 4	Carbon Impact Analytics				
Climateaction 100	Net Zero Company Benchmark	Yes	Scoring	Impact	The Net Zero Company Benchmark assesses how companies are performing on reducing GHG emissions, climate governance, and climate disclosures. It was developed collaboratively with partners such as InfluenceMap and Carbon Tracker.
Corporate Accountability	Corporate Hall of Shame	No	Ranking	Reputation	The Corporate Hall of Shame is a corporate ranking based on public voting, identifying organizations with the most negative socio-environmental impact.

Actor	Scoring Name	Climate specific	Type	Focus	Description
Corporate Knights	The Global 100 list	No	Scoring & Ranking	Impact	The Global 100 list is a yearly ranking of the world's most sustainable companies, defined as those poised to succeed in the transition to a low-carbon economy. The ranking focuses on sustainable investment and revenue.
EcoVadis	Ecovadis Medals and Badges	No	Scoring & Rating	Impact	Ecovadis medals and badges recognize companies with outstanding sustainability management systems, assessing ESG issues across environment, labor & human rights, ethics, and sustainable procurement.
EcoVadis	Carbon rating	Yes	Scoring & Rating	Impact	The Ecovadis Carbon rating assesses the GHG management practices of a company, analyzing its commitment, actions, and reporting programs.
ECPI	ESG rating			Risk	
Ethifinance	Various			Risk	
Fitch	ESG Vulnerability score	No	Scoring	Risk	The ESG Vulnerability score assesses risks arising from foreseeable socio-environmental changes up to 2050, based on a 2°C global warming scenario.
FTSE Russel	FTSE ESG Scores	No	Scoring	Risk & Impact	FTSE's ESG scores assess corporate ESG exposure (risk) and performance (socio-environmental impacts). The climate section is partially based on Transition Pathway Initiative assessments.
Inrate	ESG impact ratings	No	Scoring & Rating	Impact	Inrate's ESG impact ratings provide insights into corporations' ecological, social impacts, and governance policies.

Actor	Scoring Name	Climate specific	Type	Focus	Description
Insight Investment	Prime climate risk ratings	Yes	Scoring & Rating	Risk	Insight's climate risk ranking comprehensively ranks fixed income corporate credit issuers, focusing on climate change-related risks (physical and transitional).
Insight Investment	Prime ESG ratings	No	Scoring & Rating	Risk	Insight's ESG risk ratings reflect material ESG risks that companies are exposed to.
ISS / Oekom	ESG Corporate Rating	No	Scoring & Rating	Risk	ISS' ESG corporate rating assesses the ESG performance of issuers.
ISS / Oekom	Carbon Risk Rating	Yes	Scoring & Rating	Risk	ISS's carbon risk rating assesses a company's ability to cope with climate change-related challenges and seize opportunities in a low-carbon economy.
JUST Capital	Annual JUST capital corporation ranking	No	Scoring & Ranking	Impact	The annual JUST Capital ranking rates companies across ESG issues identified and weighted by the American public through surveys.
Moody's / Vigeo EIRIS	ESG risk score			Risk	
Moody's / Vigeo EIRIS	Climate risk score			Risk	
MorningStar / Sustainanalytics	Low Carbon Transition Rating	Yes	Scoring & Rating	Impact	A forward-looking assessment estimating a Temperature Rise Score, indicating how close a company is to respecting its 1.5°C budget.
MorningStar / Sustainanalytics	ESG Risk rating	No	Scoring & Rating	Risk	The ESG risk ratings assess the magnitude of unmanaged corporate ESG risks.

Actor	Scoring Name	Climate specific	Type	Focus	Description
MorningStar / Sustainanalytics	Physical risk rating	Yes	Scoring & Rating	Risk	Morningstar's physical risk rating provides quantitative data to understand and manage land-related climate exposure and risks.
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	Yes	Scoring & Rating	Impact	The MSCI implied temperature rise rating evaluates how corporate emissions targets compare with the 1.5°C and well below 2°C targets outlined by the Paris agreement.
MSCI / KLD / Innovest	MSCI ESG Rating	No	Scoring & Rating	Risk	The MSCI ESG Rating assesses corporate management of ESG risks, combining exposure and management metrics from environmental and social issues, and corporate governance factors.
Refinitiv / Asset4 / Thomson & Reuters / LSEG	ESG Score	No	Scoring	Impact	LSEG's ESG scores measure a company's relative ESG performance, commitment, and effectiveness, based on company-reported data.
RepRisk	RepRisk Index	No	Scoring	Reputation	The RepRisk Index (RRI) is a proprietary algorithm that actively measures and assesses the reputational risk a company or project faces regarding ESG issues.
RepTrak	ESG Perception & Global RepTrak 100	No	Scoring & Ranking	Reputation	Reptrack's ESG scoring system measures how stakeholders view a company's ESG performance.
SAM / S&P Global / Trucost	S&P Global ESG Score	No	Scoring	Risk	The S&P Global ESG Score measures a company's performance on and management of material ESG risks, opportunities, and impacts. It is used to determine the eligible universe for the Dow Jones Sustainability Index.

Actor	Scoring Name	Climate specific	Type	Focus	Description
SAM / S&P Global / Trucost	Climate Transition Assessment	Yes	Rating	Impact	The S&P Climate Transition Assessment is a qualitative scoring system assessing company progress and future performance in the low-carbon economy.
SBTi	Science Based Targets labels	Yes	Label	Impact	SBTi labels certify that corporate emission reduction targets are aligned with the Paris Agreement and limit global warming to 1.5°C above pre-industrial levels.
Sensefolio	Sensefolio ESG framework	No	Scoring	Impact	The Sensefolio ESG framework rates companies on environmental, societal, and governance issues on a scale from 0 to 100.
SSI	ESG Rating	No	Scoring & Rating	Impact	SSI's ESG Rating rates companies on environmental, societal, and governance issues.
SSI	Carbon neutrality rating	Yes	Scoring & Rating	Impact	SSI's carbon neutrality rating extends the ESG scoring to scrutinize climate performance, encompassing policy management, carbon emission intensity, carbon reduction capability, renewable energy usage, and carbon management.
SynTao Green Finance	SynTao ESG Rating	No	Scoring & Rating	Risk	The SynTao ESG rating evaluates the quality of ESG management and the level of risk exposure across environmental, social, and governance pillars, with companies rated from A to D.

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Actor	Scoring Name	Climate specific	Type	Focus	Description
ZKB Sustainability Research	Swisscanto Sustainability rating	No	Scoring & Rating	Impact	Swisscanto Sustainability rating evaluates companies and countries on four pillars: ESG management, Controversy score, Climate score, and SDGs contribution. Companies and countries are rated from A to G.

Table 6: Additional description table that displays the actor's name, rating name, scoring company pool, scoring data source, and scoring availability. This table does not include actors for which no rating has been identified (Broadridge, Clavert, Ethibel, Solactive, STOXX, Wind). The information pertaining scoring for which no public documentation is available is left empty in this table (Carbone 4's Carbon Impact Analytics; ECPI's ESG Rating, Ethifinance's various unidentified ratings, Moody's / Vigeo EIRIS' ESG and climate risk score (discontinued in 2024)).

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
3BL Media	100 Best Corporate Citizens	Russell 1000	The 3BL Media scoring system relies on ISS data. ISS data stems from corporate websites, reports, and documents (e.g., annual reports, corporate responsibility and sustainability reports, SEC filings, policies, etc.) and reputable third parties (e.g., CDP, Compustat, GRI, U.N. Global Compact, U.S. EPA).	Aggregate scores on pillars are fully available online.

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Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
ADEME ACT Solutions	ACT Rating	Companies can either voluntarily request to be accompanied in the construction of their climate strategy, voluntarily request to assess their previously defined strategy, or answer the ACT initiative outreach efforts, that are focused on high-emissions industries and companies that granted shareholders a say on climate.	"Assessments can be conducted in autonomy by an analyst or be requested by companies. In the first case, it includes only public data. In the second case, it can include private elements. Sources for public data include public sustainability reports and CDP questionnaires.	Scores and assessment details are available online accross the websites of the ACT initiative, the website of the World Benchmarking Alliance and the website of the Forum for responsible investment, which are partners of the initiative. ACT public assessment data is also available through the Transition Arc data hub (free registration).
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	Unavailable information	The scoring uses aggregated data from MSCI ESG, Vigeo EIRIS, and RepRisk.	The score are not available online, they are used only for online investment portfolio proposal definition.
BCorp	B Corp Label	Any willing company	Data is collected through a proprietary questionnaire.	The list of BCorp labelled companies and their detailed assessment are available online. The results of the B Impact Assessment are not public, but anonymized aggregates are made available to companies that take the assessment.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Bloomberg	ESG Score	While the limits of the company pool aren't specified, the score covers 15,000 companies across more than 100 countries, i.e., approximately 93% of global market capitalization.	ESG scores are based on publicly available, company-disclosed information. Sources include sustainability reports, annual filings, and company websites.	The aggregated subscores and scores are available on the Bloomberg platform, which is a private platform accessible only to Bloomberg clients.
Bloomberg	UN SDG Impact Materiality	This is unspecified in the provided information.	Revenue share per product is the only company-specific data collected. It is collected from public financial disclosures such as annual reports, filings, and investor presentations.	The aggregated subscores and scores are available on the Bloomberg terminal, which is a private platform accessible only to Bloomberg clients.
Bloomberg	Various, including "Transition risk assessments, physical risk exposure indicators, and implied temperature rise metrics"			

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Carbon Disclosure Project	CDP Climate Score	Any company that has been requested to respond by the CDP organization is rated.	Data used stems from CDP questionnaire responses. Companies that have been requested to respond but didn't are rated F.	Final scores are available on the CDP website after a (free) subscription, along with questionnaire responses for companies that chose to make them public.
Carbone 4	Compatibility score with the Paris Agreement	To our knowledge, the scoring has never been applied at scale.	The methodology is applied as part of a consulting mission. Data is provided in private by the assessed company.	Assessment results are private.
	Carbon Impact Analytics			
Climateaction 100	Net Zero Company Benchmark	The organization focuses on 150 companies relevant the investment conglomerate participating in the initiative.	The data used includes public and self-disclosed data from companies, collected from annual sustainability and financial reports, press releases, and CDP disclosures.	Final scoring and subcategories are available on the Climate Action 100+ website. Input data is not available.
Corporate Accountability	Corporate Hall of Shame	Selected companies that have been involved in controversies during the assessment year. Other companies can be included upon request.	Input data are public votes made via the Corporate Accountability website.	Surprisingly, the ranking results do not seem to be systematically available online.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Corporate Knights	The Global 100 list	Assessed companies are publicly listed companies with a certain minimum gross revenue.	Rating is based on publicly-disclosed data from financial filings, sustainability reports, and company websites.	Ranking is available in full for each assessment year.
EcoVadis	Ecovadis Medals and Badges	Any company requested to fill the EcoVadis questionnaire by their supplier or voluntarily requesting an assessment are included in the score's company pool.	Rating is based on corporate responses to the EcoVadis questionnaire, but also on public information disclosed by independent third parties (NGOs, trade unions, international organizations, local authorities, etc.).	Scoring results, input data, and recommendations are available when subscribing to the EcoVadis service.
	Carbon Rating	Any company requested to fill the EcoVadis questionnaire by their supplier or voluntarily requesting an assessment are included in the score's company pool.	Rating is based on corporate responses to the EcoVadis questionnaire, but also on public information disclosed by independent third parties (NGOs, trade unions, international organizations, local authorities, etc.).	Scoring results, input data, and recommendations are available when subscribing to the EcoVadis service.
ECPI	ESG Rating			
Ethifinance	Various			

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Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Fitch	ESG Vulnerability Score	The score focuses on rating industries and covers 94 subsectors. To our knowledge, Fitch does not disclose further information.	According to our research, the list of datapoints used and their sources is not available. However, some examples of sources include public disclosures in sustainability reports, financial filings, CDP disclosures, specialist providers (Urgentem, Quantis, South Pole, ISS), and other industry-specific sources.	A subscription to Fitch financial services is necessary to access corporate datapoints and score results. Industry-level results are available for free on the Fitch website.
FTSE Russell	FTSE ESG Scores	Companies assessed are part of the FTSE All-World Index, FTSE All-Share Index, and Russell 1000® Index.	The assessment is based on publicly available data, including corporate reports, websites, and press releases.	Scores and input data are accessible after subscribing on the FTSE online data platform.
Inrate	ESG Impact Ratings	Inrate rates primarily public issuers that form the majority of market capitalization. Private companies can also be rated upon request.	Inrate uses company disclosures and information from unspecified third-party sources.	Final score and input data are available on the Inrate website for their clients.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Insight Investment	Prime Climate Risk Ratings	Insight Investment states that 16,800 issuers have been rated. It is unclear whether these were only rated upon request from their lenders, or if companies have been rated spontaneously within a pool.	The assessment takes into account both public elements and direct corporate responses to an undisclosed questionnaire.	Final score and analyses are made available to investment structures subscribing to the Insight Investment climate risk assessment service.
	Prime ESG Ratings	Insight Investment states that 3,000 issuers have been rated. It is unclear whether these were only rated upon request from their lenders, or if companies have been rated spontaneously inside a pool.	The assessment is based on multiple, unspecified data inputs.	Final score and analyses are made available to investment structures subscribing to the Insight Investment ESG risk assessment service. Aggregate score data is available for free on the Insight Investment website.
ISS / Oekom	ESG Corporate Rating	ISS ESG states that 12,000 issuers have been rated. It os unclear whether these were only rated upon request from their lenders, or if companies have been rated spontaneously inside a pool.	ISS's ESG corporate rating is based primarily on publicly available information, including corporate voluntary disclosures, media information, governmental and NGO databases.	Score and subscores are freely available on the ISS ESG website.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
	Carbon Risk Rating	ISS ESG states that 12,000 issuers have been rated. It is unclear whether these were only rated upon request from their lenders, or if companies have been rated spontaneously inside a pool.	ISS's carbon risk rating is based primarily on publicly available information, including corporate voluntary disclosures, media information, governmental and NGO databases.	Score and subscores are freely available on the ISS ESG website.
JUST Capital	Annual JUST Capital Corporation Ranking	Considered companies are part of the Russell 1000 Index. JUST Capital excludes companies without available data, holding companies, duplicate securities, companies with too few or no employees in the U.S., and companies that have been acquired since the index construction.	The ranking is based on publicly available data on corporate behavior from company filings, third-party data platforms, vendors, government datasets, academic and NGO datasets. This data is completed by in-house surveys.	Scores and intermediate results are available in full on the JUST Capital website.
Moody's / Vigeo EIRIS	ESG Risk Score			
	Climate Risk Score			

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
MorningStar / Sustainalytics	Low Carbon Transition Rating	Assessed companies are listed in major global indices.	The rating is mostly automated based on public information. Companies are not requested to submit supporting documents, except if they submit exceptionally private data to challenge their initial rating.	Scores are available on the Morningstar / Sustainalytics platform for subscribed clients.
	ESG Risk Rating	Assessed companies are listed in major global indices.	The rating is mostly automated based on public information. Companies are not requested to submit supporting documents, except if they submit exceptionally private data to challenge their initial rating.	Aggregated scores are available on the Morningstar / Sustainalytics portal for subscribed clients.
	Physical Risk Rating	Assessed companies are listed in major global indices.	The rating is mostly automated based on information from the XDI database.	Scores are available on the Morningstar / Sustainalytics platform for subscribed clients.
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	All companies in the MSCI ACWI Index and MSCI US Investible Market Index (IMI) are assessed.	Data used are scope 1, 2, and 3 emission levels from the MSCI ESG database. The database leverages regulatory datasets, news and media, and voluntary emission disclosure.	Resulting ratings are partially available for free on the ESG Ratings & Climate Search Tool.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
	MSCI ESG Rating	All companies in the MSCI ACWI Index and MSCI US Investible Market Index (IMI) are assessed.	The MSCI database leverages voluntary corporate disclosures, regulatory datasets, news and media, and voluntary emission disclosure.	Resulting ratings are partially available for free on the ESG Ratings & Climate Search Tool.
Refinitiv / Asset4 / Thomson & Reuters / LSEG	ESG Score	The score focuses companies listed in major global indices.	The scoring uses company-reported data from public information sources (Annual corporate CSR reports, company websites, news sources, etc.).	Data and score results are available behind a paywall on the LSEG platform.
RepRisk	RepRisk Index	RepRisk rates any company facing a public ESG incident.	RepRisk relies on the analysis of media content and stakeholder declarations to identify ESG incidents. The analysis is partially AI-driven. RepRisk specifically ignores corporate disclosure content.	Data and score results are available behind a paywall on the RepRisk platform.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
RepTrak	ESG Perception & Global RepTrak 100	RepTrak focuses on corporate global brands with a global revenue above 2 billion USD and have sufficient visibility for the public (measured by another proprietary indicator: the Global Familiarity Index).	Reptrack leverages responses to dedicated questionnaires from the general public.	Data and score results are available behind a paywall on the RepTrak platform.
SAM / S&P Global / Trucost	S&P Global ESG Score	Selected companies for their market relevance, typically part of the DJSI.	The scoring is based on voluntary corporate responses to industry-specific proprietary questionnaires, public data scrapping in case the company fails to answer, and continuous monitoring of media for controversies.	Data and score results available behind a paywall on the S&P platform. Some examples of data and results are available for free on the platform.
	Climate Transition Assessment	Unavailable information	Unavailable information	Results available behind a paywall on the S&P platform.
SBTi	Science Based Targets Labels	Any willing company can request to be labelled.	Companies submit an application file with supporting documents when requesting the label.	Labels obtained by companies are available on the target dashboard on the website.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
Sensefolio	Sensefolio ESG Framework	Unavailable information	The score relies on scrapped public information (News, corporate disclosures, social media posts, company reviews & NGO reports).	Data and score results are available behind a paywall on the Sensefolio hub platform.
SSI	ESG Rating	The rating focuses on A-share listed companies in China and investable Hong Kong-listed companies.	The rating relies on scrapped public information completed statistically for missing data.	Data and score results are available behind a paywall on the Wind platform.
	Carbon Neutrality Rating	The rating focuses on A-share listed companies in China and investable Hong Kong-listed companies.	The rating relies on scrapped public information from voluntary and mandatory corporate ESG disclosures.	Data and score results are available behind a paywall on the Wind platform.
SynTao Green Finance	SynTao ESG Rating	The rating focuses on listed companies in Mainland China and Hong Kong.	Data used stems from in-house public data scrapping based on corporate voluntary disclosure, regulatory data, & media content.	Final core results are available for free upon creating an account. Full input information is not available.

Actor	Rating Name	Scoring Company Pool	Scoring Data Source	Scoring Availability
ZKB Sustainability Research	Swisscanto Sustainability Rating	Unavailable information	Data sources are undisclosed, but ZKB specifies that data stems from corporate CSR disclosures.	Score results are not available online, they are used only for online investment portfolio proposal definitions.

Table 7: Supplementary table to clarify the assessment of scoring systems on Reliability criteria. Criteria can be identified by referring to Table 1. This table is completed by Tables 8, 9, 10.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
3BL Media	100 Best Corporate Citizens	Neither criteria weights nor the full list of criteria are accessible.	All Russell 1,000 companies are researched and ranked at no cost.	Among the datapoints requests, the rating doesn't specify the methodology required for the GHG Assessment not the climate risk identification. Various qualitative datapoints are used (e.g. "Does the company disclose a climate change strategy?" requires an implicit definition of what a minimal climate change strategy is).	While companies can verify information on an ISS portal at no cost, it's not clear to what extent they are expected to send supporting documents to support or modify the data.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
ADEME ACT Solutions	ACT rating	The ACT initiative discloses both the list of criteria and weightings applied for each sector. However, weightings are not completely transparent for companies which fall into the 'generic' industry as weightings are set by the analyst based on a weighting matrix that entails qualitative considerations. Raters' response : The rater underlined that, while weightings were established by the analyst conducting the ratings, weightings used to determine a public corporate score are nevertheless disclosed. Note on rater's response : we agree this alleviates the transparency issue. We updated our assessment accordingly.	Companies are rated by consultants they pay. Rater's response : Assessments can actually be either unsollicited or paid for by companies. In either cases, the assessment must be reviewed by a third party (either the ADEME or another independant party approved by the ADEME) if companies want to make the result public. Note on rater's response : We weren't aware of the mandatory third party audit. We updated our assessment accordingly.	Qualitative information is used as part of the process, for instance to assess corporate governance or policy engagement. The qualitative content is nevertheless assess against predefined, transparent maturity matrices. Rater's response : Indeed. We consider qualitative information is key to assessing corporate practice, as quantitative indicators suffers from biais and availability issues.	The available methodology states input data must be 'verified or verifiable', but it remains unclear whether or how data is verified in practice. Rater's response : Companies must systematically list their sources for each indicator. Nevertheless, sources can include unaudited corporate disclosure, and assessors are not required to systematically verify the source supports the data. Note on rater's response : We updated our assessment.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	J. Safra Sarasin states their methodology is proprietary and neither criteria nor weighting are available online.	While the bank does not provide direct services to rated corporations, it is unclear whether rated companies are part of the bank's investment portfolio.	Datapoints required are not disclosed.	Various data sources are used. MSCI states MSCI ESG Research has established several data review and verification processes without specifying them further. Moody's doesn't mention data verification on their website according to our research. RepRisk covers reputational incidents, requiring no data verification.
BLab	B Corp Label	Methodology is available in full, along with extensive descriptions of required datapoints.	BCorp requests a verification fee for companies that want to obtain the BCorp label.	While expected GHG Assessment, emission reduction target and climate scenario standards are defined, some datapoints remain qualitative (e.g. "The company engages in climate advocacy").	For each datapoint, precise documents and meeting transcripts are expected to support the company's disclosures.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
Bloomberg	Bloomberg ESG Rating	While methodology descriptions are not available freely on the Bloomberg public website, the company provided their methodology to us upon request, after we disclosed our criteria list. The methodology is available for clients and for scored companies, who can access the methodology on a dedicated corporate web portal.	Bloomberg rates companies based on public information and does not request payment from rated companies.	All questions are not standard-backed or qualitative but all qualitative responses are assessed against quantitative criteria (presence or absence of responses, presence or absence of specific elements in answer).	Rating is automated based on public information. Companies are not requested to submit supporting documents.
Bloomberg	UN SDG Impact Materiality	While methodology descriptions are not available freely on the Bloomberg public website, the company provided their methodology to us upon request, after we disclosed our criteria list. The methodology is available for clients and for scored companies, who can access the methodology on a dedicated corporate web portal.	Bloomberg rates companies based on public information and does not request payment from rated companies.	The assessment only takes into account corporate revenue and its repartition across different activities, which is standard-backed and quantitative.	Rating is automated based on public information. Companies are not requested to submit supporting documents.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
Carbon Disclosure Project	CDP Climate Score	The organization provides a portal to disclose the methodology (criteria, thresholds and criteria weights) for all their questionnaires.	The NGO partially depends on corporate fees for revenue.	All questions are not standard-backed or qualitative, but all qualitative responses are assessed against quantitative criteria (presence or absence of responses, presence or absence of specific elements in answer).	No supporting documents are required through the questionnaire's filling.
Carbone 4	Compatibility score with the Paris Agreement	Carbone 4 provides the full details of methodology and threshold values.	Carbone 4 is a consulting company that can perform such analyses for their clients.	The assessment is based only on activity GHG intensities though the life cycle assessment method. Fonctional unit are specified.	The method hasn't been applied to scale yet so the data collection and verification process isn't mentionned in the available documentation.
Climateaction 100	Net Zero Company Benchmark	Assessment criteria and aggregation method is described in full.	The initiative is supported by philantropic foundations and anonymous donors and does not request payment from rated companies.	While information on GHG emissions levels and targets is standard backed, the part of the assessment related to alignment relies on analyst judgement. There are no clear guidelines for this assessment.	Rating is automated based on public information. Companies are not requested to submit supporting documents.
Corporate Accountabil-ity	Corporate Hall of Shame	While the voting process entails no criteria and weights to disclose, the way votes are aggregated remains unclear.	Corporate accountability is an NGO financed by individual contributions and grants and does not request payment from rated companies.	While they are binary, we argue individual votes can not be considered as quantitative or standard based datapoints as they reflect the company's perception which is highly subjective.	No data is requested from companies.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
Corporate Knights	The Global 100 list	Indicators, associated taxonomies and associated weights are fully disclosed by Corporate Knights.	The methodology specifies that submissions and payment from rated companies are not required.	All datapoints are quantitative or binary and standards are specified from emissions reporting.	Rating is automated based on public information. Companies are not requested to submit supporting documents.
EcoVadis	Ecovadis Medals and Badges	Only a methodology preview is available. It includes examples of indicators and weightings, but the full range of necessary indicators, thresholds and weightings isn't accessible.	The Ecovadis assessment can be delivered as a part of a voluntary paid company CSR assessment.	Rating is based on the qualitative disclosure of corporate initiatives, although formal rating criteria (presence of certain elements, assessment guidelines) are specified.	Credit is given for answers only in the presence of supporting evidence.
	Carbon rating	Only a methodology preview is available. It includes examples of indicators and weightings, but the full range of necessary indicators, thresholds and weightings isn't accessible.	The Ecovadis assessment can be delivered as a part of a voluntary paid company CSR assessment.	Rating is based on the qualitative disclosure of corporate initiatives, although formal rating criteria (presence of certain elements, assessment guidelines) are specified.	Credit is given for answers only in the presence of supporting evidence.
FTSE Russel	FTSE ESG Scores	An overview of method and theme is available but the detail of indicators, weightings and aggregation methods is not disclosed.	FTSE rates companies based on public information and does not request payment from rated companies.	Indicators include both qualitative and quantitative data. It is not specified how qualitative data is handled.	The methodology mentions a quality and peer-review rules, but supporting documents are not part of the listed elements.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
Inrate	ESG impact ratings	A brief overview of the methodology is available on the website but no in-depth report is public.	Inrate provides paid assessments to financial actors on their portfolio but doesn't provide paid assessments for individual corporations.	The methodology doesn't disclose required datapoints.	The methodology document mentions significant measures are put in place to check the quality of the data, but the process applied is unclear.
Insight Investment	Prime climate risk ratings	A description of rating theme and approach is available on the Insight website, but precise indicators and weightings are not disclosed.	Insight investment rates companies based on public information and does not request payment from rated companies.	Indicators used are not disclosed.	The methodology document mentions significant measure are put in place to check the quality of the data, but the process applied is unclear.
	Prime ESG ratings	A description of rating theme and approach is available on the Insight website, but precise indicators and weightings are not disclosed.	Insight investment rates companies based on public information and does not request payment from rated companies.	Indicators used are not disclosed.	The methodology document mentions significant measure are put in place to check the quality of the data, but the process applied is unclear.
ISS / Oekom	ESG Corporate Rating	ISS describes the general logic of the assessment, and examples of indicators and scoring criteria. Indicator weights and thresholds are not systematically disclosed for all methodologies.	ISS ESG rates companies based on public information and does not request payment from rated companies.	ISS ESG states that about 75% used indicators are qualitative, but are systematically aligned with relevant norms, standards and regulations.	ISS ESG uses mostly public available data and recognizes that estimated data based on robust evidence represent only between 5% and 10% of total indicators.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
JUST Capital	Annual JUST capital corporation ranking	The full assessment methodology is disclosed, including required datapoints, associated thresholds and weights.	The NGO states that they do not depend on rated companies for income, relying instead on selling datasets and collaborating with media and consultants.	Datapoints used are not always standard backed or quantitative. In particular, assessments are made on qualitative corporate information without specific guidance on how this is done.	The methodology specifies a data quality insurance process to ensure data consistency but data veracity is not addressed, and supporting documents are not required.
MorningStar / Sustainanalytics	Low Carbon Transition Rating	While methodology is generally described, datapoints used, criteria and weightings for the management assessment are not disclosed.	Rated companies can subscribe to a service to get marketing and presentation assets, including more detailed insights into their score and their competitor's.	The methodology doesn't specify the expected standard for emissions disclosure and datapoints considered for emissions management rating are not disclosed.	The datapoints considered for emissions management rating are not disclosed. The methodology doesn't specify if or how information is verified.
	ESG Risk rating	While methodology is generally described, datapoints used, criteria and weightings are not disclosed.	Rated companies can subscribe to a service to get marketing and presentation assets, including more detailed insights into their score and their competitor's.	The list of datapoints used is not disclosed.	The methodology mentions quality and peer-review rules, but supporting documents are not mentioned.
	Physical risk rating	While methodology is generally described, datapoints used, criteria and weightings are not disclosed.	Rated companies can subscribe to a service to get marketing and presentation assets, including more detailed insights into their score and their competitor's.	The list of datapoints used is not disclosed.	Verification process is insufficiently described to assess this.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	The methodology is fully disclosed, including formulas and values that allow to replicate the assessment.	MSCI rates companies based on public information and does not request payment from rated companies.	The standards used for corporate greenhouse gas emission levels and targets is unspecified, but all elements are quantitative.	No data is requested from rated companies through the rating process, hence no supporting document is collected.
	MSCI ESG Rating	While methodology is generally described, datapoints used, criteria and weightings are not disclosed.	MSCI rates companies based on public information and does not request payment from rated companies.	The methodology doesn't disclose the datapoints required.	The methodology specifies a data quality insurance process to ensure data consistency but data veracity is not addressed.
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	Criteria are extensively described, but criteria weights are not specified.	LSEG rates companies based on public information and does not request payment from rated companies.	The methodology doesn't disclose the datapoints required.	While collected data is reviewed prior to usage to ensure consistency and credibility, collecting supporting documents is not mentioned.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
RepRisk	RepRisk Index	While tackled topics are listed, and the methodology to derive a score from a list of incidents is fully described, it is unclear how the incident severity, reach and novelty for each incident are rated. Rater's response : The actor provided several elements to discuss this assessment : a full Jupyter notebook allowing a technical public to further discover their methodology and dataset, the IRSG code of conduct for ESG ratings and Data Product Providers and the Checklist for Singapore Code of Conduct for ESG Rating and Data Product Providers. Note on rater's response : All these pages state RepRisk's commitment to transparency, and the Jupyter notebook indeed provided further insight in the methodology. However, incident classification isn't addressed by the provided documents, our assessment thus remains unchanged.	While it appears not to be the company's primary source of income, Reprisk offers this rating as part of a platform that allows companies to monitor their ESG reputation. Rater's response : The DRWG code of conduct for ESG Ratings and Data Products Providers states "ESG ratings and data products providers should identify, avoid or appropriately manage, mitigate and disclose actual or potential conflicts of interest that may compromise the independence and integrity of the ESG ratings and data products providers' operations." Further, the transparency commitment charter states "RepRisk exclusively focuses on ESG data and research, and does not offer any other services or products [...]." We adjusted our assessment accordingly.	RepRisk uses media reports and other non standardized content to fuel their assessment. Rater's response : None of the provided additional documents discuss this.	Input data is related to the public perception of brands, hence does not require verification.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
RepTrak	ESG Perception & Global RepTrak 100	Questionnaire content and criteria are not public.	Reptrak offers this rating as part of a platform that allows companies to monitor their ESG reputation.	Datapoints used are not disclosed.	Input data is related to the public perception of brands, hence does not require verification.
SAM / S&P Global / Trucost	S&P Global ESG Score	S&P discloses both the list of questions and relative weights of sets of questions for each industry.	While S&P's revenue typically stem from selling ESG score datasets, the company also offers paid ESG assessments directly to corporations.	According to the corporate sustainability handbook, S&P requests both quantitative, standard backed datapoints and subjective data. Companies are nevertheless urged to keep subjective data brief, relevant and on topic.	Internal documents are requested "when necessary".

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Actor	Scoring Name	Transparency	Independency	Standardization	Verification
	Climate Transition Assessment	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. Rater's response : "Our methodology is available in full online." The rater also shared new methodology description documents. Note on rater's response : While the provided documents are relevant and do provide further insights into the assessment process, they do not systematically described the environmental impacts considered for each industry and only provide examples. We updated our assessment accordingly.	While S&P's revenue typically stem from selling ESG score datasets, the company offers this specific rating as part of a consulting service. Rater's responses : "S&P provides the assessment as part of an engaged service." Note on rater's response : This confirms our initial assessment.	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. Rater's response : "Approach is largely qualitative, with full methodology documents available for download on our website (see links above)." Note on rater's response : Indeed, provided additional documents show the approach is mainly qualitative. We updated our assessment accordingly.	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed, including the data verification approach. Rater's response : "Full methodology documents available for download on our website (see links above)". Note on rater's response : There appears to have been a misunderstanding on the focus of this criterion. We maintain our initial assessment.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
SBTi	Science Based Targets labels	The SBTi Corporate Net-Zero Standard fully describes requirements for companies to get the label.	Companies pay a fee for data verification when submitting their application file. This has been flagged before as an issue, thus the organization states it will make a separate entity from its verification department and enforce a strict conflict of interest statement.	The SBTi labellisation requires only quantitative datapoints (emissions levels and targets), and the company's emissions data are required to follow the GHG Protocol standard.	The submission form includes no request for supporting documents or third party verification as of august 2024.

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
SSI	ESG Rating	Neither criteria weights nor the full list of criteria are accessible.	Despite our best efforts, we could not properly determine the company's perimeter of activity. While it first states it provides "comprehensive services for index and index investment to various asset management institutions"; it also offers "services for the entire industry chain including research consulting, product authorization, operation management, marketing promotion, valuation, and data information". Rater's response : We are independent ESG rating agency. There is no financial ties with listed companies. We do not generate revenue by providing ESG ratings to listed companies. Given the absence of supporting documents provided, we keep our initial 'no information assessment'. Note on rater's responses : The evidence provided does not support this. In the absence of further proof, we maintain our initial assessment.	According to the methodology available online, the scoring uses both quantitative and qualitative data. Qualitative data is assessed using natural language processing, it is unclear whether clear guidelines are provided for this. Rater's response : "Unstructured data is assessed based on consistent standard." Note on rater's response : The provided supporting document does not mention a consistent standard. In the absence of supporting documents, we maintain our initial assessment.	Data is public scrapped information completed statistically for missing data Rater's response : "We do not ask companies to provide supporting documents. But most of our input data is backed by their ESG report or ESG part in their annual report. We deem missing data as nondisclosure, which results in low score in this metric." Note on rater's response : "Supporting documents are supposed to be edited or audited by third parties. We maintain our original assessment."

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
	Carbon neutrality rating	Neither criteria weights nor the full list of criteria are accessible.	Despite our best efforts, we could not properly determine the company's perimeter of activity. While it first states it provides "comprehensive services for index and index investment to various asset management institutions"; it also offers "services for the entire industry chain including research consulting, product authorization, operation management, marketing promotion, valuation, and data information". Rater's response : We are independent ESG rating agency. There is no financial ties with listed companies. We do not generate revenue by providing ESG ratings to listed companies. Given the absence of supporting documents provided, we keep our initial 'no information assessment'. Note on rater's responses : The evidence provided does not support this. In the absence of further proof, we maintain our initial assessment.	According to the methodology available online, the scoring uses both quantitative and qualitative data. Qualitative data is assessed using natural language processing, it is unclear whether clear guidelines are provided for this. Rater's response : "Unstructured data is assessed based on consistent standard." Note on rater's response : The provided supporting document does not mention a consistent standard. In the absence of supporting public documents, we maintain our initial assessment.	The methodology states that is considers "data verified by independent third-party audits and certifications", but it is unclear to which extent this is a requirement for all datapoints. Rater's response : "We do not ask companies to provide supporting documents. But most of our input data is backed by their ESG report or ESG part in their annual report. We deem missing data as nondisclosure, which results in low score in this metric." Note on rater's response : "Supporting documents are supposed to be edited or audited by third parties. We maintain our original assessment."

Actor	Scoring Name	Transparency	Independency	Standardization	Verification
SynTao Green Finance	SynTao ESG Rating	Weightings and criteria remain undisclosed.	SynTao appears to be a ESG consulting company, but their precise business model is unclear. It might be supporting some of the rated companies in their ESG strategy building.	Datapoints required are not disclosed.	Data is scrapped for public information, corporations seem not to be able to challenge the data or required to provide supporting documents.
ZKB Sustainability Research	Swisscanto Sustainability rating	Weightings and criteria remain undisclosed.	While the bank does not provide direct services to rated corporations, it is unclear whether rated companies are part of the bank's investment portfolio.	Datapoints are not disclosed.	Data providers are not disclosed, and the methodology document doesn't specify any data verification methods.

Table 8: Supplementary table to clarify the assessment of scoring systems on Accuracy criteria 5 to 9. Criteria can be identified by referring to Table 1. This table is completed by Tables 9 and 10.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
3BL Media	100 Best Corporate Citizens	The methodology specifies that some factors have higher relative weights, without further description on how the weighting was chosen.	Final score is a weighted average of the scores on criteria.	While the rating takes into account the datapoint "Does the company report on progress against GHG emission reduction targets?", actual progress metrics are not part of the collected datapoints. Additionnally, there's not mention that GHG emissions reduction targets should be defined in accordance with planetary boundaries.	No justification for criteria choice is available online.	GHG emissions levels are collected, but how 3BL Media uses them in the rating system is unclear.

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
ADEME ACT Solutions	ACT rating	The ACT methodology entails an arbitrary weighting between different elements of climate strategy. Rater's response : Our perception is that weighting is not "arbitrary" as weightings are issued following a collaborative process with various stakeholders, they are framed by the ACT assessment Framework, and weights are variable depending on quantitative inputs. Note on rater's response : We agree that the weighting is constructed followed a rigorous process. However, the weighting still doesn't consititute a systematic measurement of the relative importance of the different criteria.	Final score is a weighted average of the scores on criteria. Rater's response : Subscore are made transparent and we provide the public with documentation aimed to make sure they understand each subscore must reach a minimum level for a company to be praise. Note on rater's response : This does not match best in class behavior, we maitain our assessment.	Corporate emissions targets are compared with the SBTi standard, and the final score is absolute.	Weighting and criteria are justified by the materiality of emissions sources they tackle. However, some weightings appear arbitrary (e.g. 5% of points for policy engagement).	Corporate emissions reduction levels are compared to industry benchmarks.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	The methodology includes an undisclosed weighting.	Final score is a weighted average of the scores on criteria.	Datapoints required are not disclosed.	No justification for criteria choice is available online.	Datapoints required are not disclosed.
BLab	B Corp Label	Companies are expected to meet a set of defined criteria according to their industry and size. Criteria are not weighted.	Companies are expected to meet a set of defined criteria according to their industry and size. Company cannot compensate not meeting certain criteria.	One of the mandatory criteria is to set targets and implement a reduction startegy in line with the Paris Agreement.	Criteria choice process per industry is not explicit.	GHG emissions levels are collected, but companies are only ranked on their disclosure and not their level.
Bloomberg	Bloomberg ESG Rating	The methodology description specifies each weighting is determined by the financial materiality of each data point. The financial materiality of each data point is assessed by taking into account its probability, magnitude and timing by analysts conducting proprietary research.	Final scores is computed using a power mean of scores on subcriteria. While this doesn't completely forbid compensation, it penalises companies with uneven performance across ESG aspects.	While the scoring considers whether corporations have set net zero targets, final results are relative to industry performance.	Criteria choice and weighting are established based on the principles of financial materiality.	Companies are rated based on their relative emissions levels compared to their industry peers.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Bloomberg	UN SDG Impact Materiality	Shares of revenues are used to weight the different activities. It constitutes a transparent, science-based weighting.	Final score is a weighted average of the scores on criteria.	Rating points out the positive and negative impacts of companies on UN SDGs, the magnitude of the impact is not compared with absolute objectives.	Impact identification is rooted in identifying material impacts of activities on UN SDGs.	Rating measures both negative and positive corporate impact on UN SDGs.
Carbon Disclosure Project	CDP Climate Score	The score is based on an unjustified weighting.	Companies can for instance compensate a poor emissions management performance by an acceptable disclosure score.	The ratings takes into account corporate reduction targets and compares them against planetary boundaries using the Science Based Target initiative framework.	The CDP soberly states "Each scoring category at Management and Leadership levels is weighted according to its relative importance to the overall score." and does not refer to materiality to justify the weighting.	While GHG emissions levels are requested, they are rated only based on the disclosure quality but not on their magnitude.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Carbone 4	Compatibility score with the Paris Agreement	The final corporate score is the aggregation of all the scores for each corporate activity, weighted by the share of revenue they represent.	Companies can compensate a climate missaligned activity (eg fuel extraction) with a climate compatible business line (eg renewable electricity deployment) as long as the revenue they get from these business lines is comparable.	Rating compares GHG intensities with 2030 and 2050 sectorial objectives aligned with 1.5 or 2°C global warming.	The activity GHG intensities are weighted according to their financial materiality to the company.	Rating compares GHG intensities with 2030 and 2050 sectorial objectives.
Climateaction 100	Net Zero Company Benchmark	The assessment is based on a set of pass fail criteria where all questions have the same relative importance towards the final rating.	Companies are rated separately on all aspects, the final result isn't an aggregated score.	Rating evaluates the adequacy of corporate action plan and investment strategy towards net zero and their GHG reduction targets.	Criteria choice is not discussed in the publicly accessible documents.	Rating evaluates only disclosure levels and corporate emission reduction efforts.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Corporate Accountability	Corporate Hall of Shame	The website doesn't disclose how votes are aggregated.	Companies are not rated on various criteria.	Rating is based exclusively on public perception and not on any objective criteria.	Companies description on the basis of which the public votes focuses on stringent issues, but is not build following a thorough materiality assessment.	Information provided to guide scoring focuses on current and past company ESG controversives. The description of corporations to vote for thus contain negative impact estimates.
Corporate Knights	The Global 100 list	The rating is based on a arbitrary weighting between sustainable investment, sustainable revenue and performance. Allocation of points to indexes inside these categories is based on a materiality assessment.	Companies can compensate low results in an ESG dimension by best-in-class behavior in others.	Rating evaluates companies compared to their peer groups. The final assessment is thus always relative.	Criteria choice is not discussed in the methodological report.	Companies are evaluated on their carbon productivity : the amount of revenue they generate when emitting a ton of CO2e.

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
EcoVadis	Ecovadis Medals and Badges	The scoring systems include an undisclosed, apparently arbitrary weighting between policies, endorsements, measures, etc.	Very low results on at least an ESG rating excludes companies to receive a medal.	Final medal attribution is based on corporate performance relative to their peers, the assessment is thus relative.	The methodology mentions criteria are based on the importance of the issues for the corporation geography and activity, but it's unclear whether this is based on an actual materiality assessment.	Ecovadis' rating focuses on management of externalities but does not take into account initial externality levels.
	Carbon rating	The rating is based on an unjustified weighting between reporting, commitment and actions.	Companies can compensate low results in an ESG dimension by best-in-class behavior in others.	Companies are expected to set Science Based Targets in accordance with the Science Based Target initiative standard to get full points on the commitment section.	This is unspecified across the public information available.	While the rating requests scope 1, 2 &3 emissions data, companies are assessed only based on the comprehensiveness and quality of their disclosures.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
FTSE Russel	FTSE ESG Scores	Final rating is a weighted average of corporate performance over different pillars across different themes. The themes' relative importance is translated into an arbitrary weight. Similarly, indicators have undisclosed arbitrary weights.	The final rating is a weighted average of scores on different ESG aspects.	Corporate performance is only assessed against industry best practice.	(Financial) materiality is mentioned as a driver for the selection and relative weighting of issues.	The assessment compares corporate emission levels to their peers.
Inrate	ESG impact ratings	The assessment is based on an undisclosed, unjustified weighting.	There's insufficient information on the methodology to be able to assess this element.	There's insufficient information on the methodology to be able to assess this element.	There's insufficient information on criteria choice in the publicly available elements.	The assessment claims it takes into account the impact of the company's activity across its products lifecycles.

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Insight Investment	Prime climate risk ratings	The methodology description specifies each weighting is determined by the financial materiality of each data point for each industry but process to assess financial materiality is not described.	Companies might compensate having no reduction targets with appropriate reporting or climate friendly offerings. Yet, the final score takes is the minimum of both transition risk and physical risk final score, making it impossible to compensate between these two aspects.	It's unclear how gross emission levels and emission reduction targets are rated.	The assessment relies on the assessment of the criteria's financial materiality.	Gross emissions are included as input data, but its possible only their disclosure is assessed.
	Prime ESG ratings	The methodology description specifies each weighting is determined by the financial materiality of each data point for each industry but process to assess financial materiality is not described.	Companies can compensate poor performances on environmental pillars with better results on other ESG aspects.	It's unclear how gross emission levels and emission reduction targets are rated.	The assessment relies on the assessment of the criteria's financial materiality.	The assessment includes an evaluation of how a company's product and service contribute to climate change.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
ISS / Oekom	ESG Corporate Rating	The methodology description specifies each weighting is determined by the double materiality of each data point for each industry but process to assess double materiality is not explicit.	The final score is a weighted average of subscores across dimensions.	The assessment mentions SBTi as a source of standard for their assessment, they thus take into account whether corporation aim to align their emissions with the Paris Agreement.	The methodology description states that the assessment is constructed by using a double materiality lens, assessing both the impact of ESG risks on the company's financial performance and the impact of the externalities linked to the pursuit of the company's activities.	Used indicators and assessment methodologies are not disclosed.
JUST Capital	Annual JUST capital corporation ranking	The weighting issue is derived from the public survey in a systematic manner and is transparent.	Companies can compensate poor performances on environmental pillars with better results on other ESG aspects.	Corporations are expected to commit to reduce their emission to align with the Paris Agreement.	Criteria are justified by the results to a public survey that aims to identify the most pressing issues in the eyes of the American public. This doesn't necessarily translate into the most material ESG issues.	Scope 1, 2 & 3 emission levels are assessed against industry average.

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
MorningStar / Sustainanalytics	Low Carbon Transition Rating	The emission management score entails an undisclosed, unjustified weighting.	As part of the management score, companies can compensate low levels of GHG emission reduction targets with financial solvency, for example.	Companies are rated based on the difference between their projected carbon emissions and their downscaled carbon budget.	The emission management score entails an undisclosed, unjustified weighting.	Companies are rated based on the difference between their projected carbon emissions and their downscaled carbon budget.
	ESG Risk rating	The methodology description specifies each weighting is determined by the financial materiality of each data point for each industry but process to assess financial materiality is not assessed.	The final score is a weighted average of subscores on material ESG issues.	While methodology is generally described, datapoints used, criteria and weightings are not disclosed. It is thus unclear whether corporate performance is compared against planetary boundaries.	The assessment relies on the assessment of the criteria's potential impact, but exclusively on corporate finances (financial materiality).	The ratings only evaluate the adequacy and comprehensiveness of corporate policies to manage material ESG risks, but criteria weights might be influenced by corporate emissions levels or intensities (betas).
	Physical risk rating	The weighting is derived from each risks' magnitude, assessed only based on their impact magnitude and likelihood of occurance.	The final score is the sum of all risks, a major risk thus cannot be alleviated by minor risks.	Rating focuses on physical climate risks, which are generally unaffected by the company's performance regarding the planetary boundaries.	The assessment relies on the assessment of the criteria's potential impact, but exclusively on corporate finances (financial materiality).	This is outside the assessment perimeter.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	The system doesn't require any weighting as a single criterion is considered.	Companies cannot compensate different ESG aspects as a single criterion is considered.	The rating compares corporate carbon trajectories with the remaining carbon budget to stay below 2°C of global warming.	There is only one criterion considered.	All companies, regardless of their initial emissions, are expected to reduce their emissions by the same proportion.
	MSCI ESG Rating	The selection and weighting of industry specific issues are justified by an externalities impact measurement. However, no systematic method to perform such assessment is described.	The final scoring is a weighted average of environmental, social and governance subscores.	The scoring measures the performance of companies on each criteria compared to its peers.	The assessment relies on the assessment of the criteria's potential impact on corporate finances and the company's externalities.	The methodology doesn't disclosed the datapoints required nor how they are evaluated.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	The methodology description specifies each weighting is determined by the materiality of each data point for each industry but, in practice, materiality is determined either by "data points with sufficient disclosure are used as a proxy for industry magnitude" or by comparing median of quantitative data to other industries. It is unclear whether the resulting weights effectively correlate with negative impact magnitude.	Final score is a weighted average of the scores on criteria.	The scoring is designed to measure company performance relative to their industry peers.	The methodology description specifies each weighting is determined by the materiality of each data point for each industry but, in practice, materiality is determined either by "data points with sufficient disclosure are used as a proxy for industry magnitude" or by comparing median of quantitative data to other industries. It is unclear whether the resulting weights correlate with negative impact magnitude.	Datapoints required for each pillar are not disclosed.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
RepRisk	RepRisk Index	Input data: The methodology includes undisclosed, unjustified weightings of ESG incidents based on severity, reach, and novelty. Rater's response: RepRisk provided a notebook, shared the IRSG Code of Conduct, their response to the Singapore Code of Conduct Checklist, and RepRisk's Transparency Commitment Charter. Note on response: While these materials affirm RepRisk's commitment to transparency and offer more methodological insight than previously available, the issue of incident classification remains unaddressed. Our assessment remains unchanged.	The final score is a weighted average of results for each incident. Companies thus can mitigate a bad performance on some ESG aspects by a better performance on others.	RepRisk's ESG scoring systems measure how stakeholders view a company's ESG performance. This doesn't necessarily correlate with performance against planetary boundaries.	The methodology does not disclose how criteria are justified. In particular, the methodology doesn't describe how 'incident severity' is rated. Rater's response : Reprisk provided a full Jupyter notebook allowing a technical public to further discover their methodology and dataset. Note on rater's response : We did not find further information on incident severity assessment in the provided additional documentation. We maintain our initial assessment.	Media coverage of corporate impacts is used, but its correlation to negative impact levels remains unclear. Rater's response: RepRisk's transparency charter highlights their "outside-in" approach, analyzing public sources and stakeholder information and excluding company self-disclosures. Note on response: While the critique of self-reported data is valid, we maintain doubts that media coverage accurately reflects corporate negative impacts. Our assessment remains unchanged.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
RepTrak	ESG Perception & Global RepTrak 100	The methodology includes an undisclosed, unjustified weighting.	The final score is a weighted average of results for each indicator.	Reptrack's ESG scoring systems measure how stakeholder view a company's ESG performance.	Reptrack's ESG scoring systems measure how stakeholder view a company's ESG performance. Public perception doesn't always focus on the most material corporate sustainability issues.	Input data is related to the media coverage of corporate impacts. It's unclear whether this systematically correlates to negative impact levels.
SAM / S&P Global / Trucost	S&P Global ESG Score	Weighting of issues is based on a double materiality assessment. While the approach to do so is generally disclosed, further information on the evaluation process of risks & opportunities and impact of externalities would have been welcomed.	Final score is a weighted average of the scores on criteria.	Scoring is designed to help compare performance with industry peers.	S&P presents weights as the results of a double materiality assessment, where both the risk & opportunities for the firms and the external impact of their activity was taken into account.	Emission levels are requested and used to assess company performance.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
	Climate Transition Assessment	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. Rater's response : "Methodology is not a scoring method with weights, rather it is a qualitative and contextual analysis.". Note on rater's response : "Indeed, the method is qualitative. Yet, implicitly, different environmental impacts, internal governance initiatives etc are given different importance, which constitute implicit weights. In the absence of information on how elements are prioritized, we maintain our assessment."	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. We are not able to assess the score on this issue. Rater's response : "A company's options are considered given regional jurisdiction and technological availability." Note on rater's response : There appears to have been a misunderstanding on the focus of this criterion. The additional document provided nevertheless show that companies are for instance able to compensate misadaptation to the climate transition by climate impact.	The rating takes into account the corporation's climate transition plan to assess how compatible with 1.5°C average global warming the business will be.	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. Rater's response : "Material sustainability factors for a company are considered." Note on rater's response : Indeed, and the provided document support this claim. We updated our assessment accordingly.	The rating takes into account how consistent the company's activities are with a low carbon future.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
SBTi	Science Based Targets labels	The system doesn't require any weighting as a single criterion is considered.	Companies cannot compensate different ESG aspects as a single criterion is considered.	While whether minimum levels required by Science Based Targets are in line with the planetary boundaries can be discussed, it's the organisation goal to provide an absolute assessment of corporate targets compared to the Paris Agreement commitments.	There is only one criterion considered.	Companies are rated based on the difference between their projected carbon emissions and their downscaled carbon budget.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
SSI	ESG Rating	Weighting of issues is based on risk (impact magnitude and probability of occurrence) associated with the datapoint for the industry. While approach is disclosed, further information on the evaluation process for risks would have been welcomed. Rater's response : "We plan to make our weighting heatmap public next year. As for now, the weightings can be seen on our newly-launched SMART ESG platform or detailed ESG rating report. These are open to listed companies or paid users." Note on rater's response : While this would indeed increase the transparency of the assessment, it does not contribute to further transparency on the weighting choice process.	Final score is a weighted average of the scores on criteria.	Final ratings are scaled according to industry-wide results. Rater's response : "We can provide users both pre-industry adjusted results for absolute comparison and industry-adjusted results for cross-industry comparison." Note on rater's response : While this does indeed help make the rating absolute, the supporting documents do not mention the Paris Agreement, planetary limits or corporate emission reduction targets. We maintain our assessment.	Weighting of issues is based on risk (impact magnitude and probability of occurrence) and weight is set to 0 for non-relevant indicators. It is unclear whether this is understood in the sense of financial materiality or externalities magnitude.	GHG emissions levels are collected, but how SSI uses them in the rating system is unclear. Rater's response : "GHG emissions levels are collected, the higher the GHG intensity the lower the score." Note on rater's response : This is not explicit in any public document found or provided. We maintain our assessment.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
	Carbon neutrality rating	SSI explains the criteria's specifics weights reflect their overall importance in achieving global carbon neutrality. It is unclear how this importance is defined or measured. Rater's response : "We plan to make our weighting heatmap public next year. As for now, the weightings can be seen on our newly-launched SMART ESG platform or detailed ESG rating report. These are open to listed companies or paid users." Note on rater's response : While this would indeed increase the transparency of the weighting, it does not contribute to make it more science-based.	Final score is a weighted average of the scores on criteria.	Final ratings are scaled according to industry-wide results. Rater's response : "We can provide users both pre-industry adjusted results for absolute comparison and industry-adjusted results for cross-industry comparison." Note on rater's response : While this does indeed help make the rating absolute, the supporting documents do not mention the Paris Agreement, planetary limits or corporate emission reduction targets. We maintain our assessment.	SSI explains the criteria's specifics weights reflect their overall importance in achieving global carbon neutrality. It is unclear how this importance is defined or measured.	The carbon emission intensity dimension evaluated the performance of corporate greenhouse gas emissions and compares it to their peers.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
SynTao Green Finance	SynTao ESG Rating	The methodology includes an undisclosed, unjustified weighting.	Final score is a weighted average of the scores on criteria.	According to the methodology disclosed, only risks exposure and their governance is assessed.	The methodology states the scoring uses "Material ESG indicators that are consistent with international practice and the actual situation in China". It is unclear whether this is understood in the sense of financial materiality or externalities magnitude.	According to the methodology disclosed, only risks exposure and their governance is assessed.
ZKB Sustainability Research	Swisscanto Sustainability rating	The methodology specifies that some factors have higher relative weights, without further description on how the weighting was chosen.	Final score is a weighted average of the scores on criteria.	Datapoints required are not disclosed.	The ESG score is based on indicators deemed "financially relevant from a risk and opportunity point of view".	Corporation GHG intensities are compared to benchmarks and companies are rated accordingly.

Table 9: Supplementary table to clarify the assessment of scoring systems on Accuracy criteria 10 to 14. Criteria can be identified by referring to Table 1. This table is completed by Table 10.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
3BL Media	100 Best Corporate Citizens	No information on emission reduction strategy content is collected during the scoring process.	The system is an automated rating based on ISS data only. While companies are welcome to update their data and give feedback, the FAQ and methodology do not mention integrating other stakeholders.	While no sector is formally excluded, a deduction of 100 from the overall weighted score is applied to companies involved in tobacco production.	Scope 3 GHG accounting and reduction targets collected.	For instance, the scoring takes in account Science Based Targets compliant reduction targets.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
ADEME ACT Solutions	ACT rating	On average, a third of the rating is dedicated to assessing future corporate performance.	Stakeholders management is considered as part of the assessment but stakeholders do not contribute to defining the materiality of criteria.	The ACT initiative is focused on hard-to-abate sectors and thus does not exclude any specific industry. Rater's response : Rather than "false" maybe set "non applicable"? As a matter of fact there is no point in our view to exclude a company from assessment. Note rater's response : For the sake of consistency, we maintain our assessment, but will discuss the relevance of this criterion in the manuscript.	Assessed impacts include scope 3 emissions.	For example, all companies are not mandated by law to commit to emisssion reduction targets.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	Datapoints required are not disclosed.	The scoring includes a media and stakeholder analysis that takes into account relevant business controversies and incidents involving the rated company.	Coal, GMOs in agriculture and mediecine, Palm oil, Defence and Armament, Tobacco, Adult Entertainment and companies that are in violation of Human Rights and other Global Compact Principles are excluded from the scoring.	According to the methodology description, criteria take into account direct and indirect impacts along the value chain.	Datapoints required are not disclosed.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
BLab	B Corp Label	Climate transition plan is scrutinized to make sure they are consistent with corporate reduction targets.	The available document do not mention of stakeholders when it comes to methodology building or input data sharing.	Companies evolving or making business with companies evolving in the firearms, weapons, munitions, pornography, tobacco, gambling or recreation marijuana sectors; companies directly involved with prisons and detention center, coal or oil sands and companies deriving more than 5% of their global annual revenue from coal or oil sands are ineligible. Further unspecified sector specific restrictions apply.	Criteria include measuring and setting targets to reduce value-chain emissions.	For instance, companies are not mandated by law to commit to Paris aligned reduction targets.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Bloomberg	Bloomberg ESG Rating	Rating considers carbon reduction targets.	Rating is automated. While methodology updates are driven by research, consultation with external experts and active engagement with clients, the general public isn't solicited.	This is not mentioned in the methodology document and rating covers 93% of market capitalization.	Scope 3 GHG accounting and reduction targets are collected and taken into consideration.	Setting net zero targets is not commonly mandated by regulation.

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Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Bloomberg	UN SDG Impact Materiality	Rating is based only on current corporate revenue repartition.	Rating is automated. While methodology updates are driven by research, consultation with external experts and active engagement with clients, the general public isn't solicited. However, it's unclear whether the UNEP FI SDG sector mapping (which constitutes the base of the score) involves stakeholders for determining positive and negative SDG impacts.	This isn't mentioned in the methodology provided and negative impacts are considered.	Impacts on UN SDGs are considered on the value chain level.	Companies are not expected to ensure their activities have no negative impacts on UN SDG goals.
Carbon Disclosure Project	CDP Climate Score	Emissions targets and associated action plan are considered in the scoring process.	Rating takes into account only corporate responses to a standardised questionnaire.	All sectors can be scored, altough differently.	Scope 3 emissions disclosure, targets and strategy is scrutinized.	For instance, emissions reduction is not systematically manadated by regulation.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Carbone 4	Compatibility score with the Paris Agreement	The assessment is only an assessment of the current GHG intensities of corporate activities.	Rating takes into account only corporate responses to a standardised questionnaire.	Companies from all sectors can be rated.	Value chain emissions are taken into account in the activity emission's assessment.	For instance, companies are not systematically expected to align their activities why certain GHG intensities.
Climateaction 100	Net Zero Company Benchmark	Rating evaluates the adequacy of corporate action plan and investment strategy towards net zero.	Framework is reviewed by the investor conglomerate yearly. Other stakeholders are not involved in the rating process.	The rating actually focuses on climate controvertial sectors (oil & gas, air transportation, etc) as those are the most critical sectors to achieve the low carbon transition.	The assessment takes into account scope 3 emissions reduction targets.	For instance, companies are not systematically expected to reduce their emissions.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Corporate Accountability	Corporate Hall of Shame	Information provided to guide scoring focuses on current and past company ESG controversives. The description of current raters do not contain foward looking information.	Results are based on public vote. While this opens up the discussion to more stakeholders, it doesn't mean relevant stakeholder will see the inquiry and answer.	This rating aims to identify the least responsible business. Excluding controversial sectors make little sense with this objective.	The text description of the various candidate include value chain impacts (eg impacts of investments and sold products). It's unclear how systematic this scrutiny is and if these elements are effectively taken into account by the public when voting for the corporate hall of shame.	The rating doesn't use any formal criteria.
Corporate Knights	The Global 100 list	The assessment doesn't take into account any forward-looking information.	Rating is automated based on public information and stakeholders are thus not sollicited.	The list of sectors isn't specified, but the methodology states that companies from certain activities "counterproductive to sustainable development" are screened out.	The scoring request the disclosure of the company's top 5 suppliers but this is part of the social assessment and is not sufficient to evaluate value chain externalities.	For instance, companies are not mandated by law to have certain carbon productivity levels.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
EcoVadis	Ecovadis Medals and Badges	Corporate targets and actions to fulfill the targets are scrutinized.	Ecovadis states their assessment is based on the company's response, supporting documents, and the analyst's opinion, only.	Companies evolving in the tobbacco, weapons and ammunition, coal and ligntie mining, and coal sectors are not eligible to recieve Ecovadis medals.	A section of the score covers supplier management (upstream emissions). It is unclear to what extent downstream emissions are also scrutinized as they are not mentionned in publicly available content.	For instance, companies are not mandated to set GHG reduction targets.
	Carbon rating	The rating takes into account corporate reduction targets and initiatives.	Ecovadis states their assessment is based on the company's response, supporting documents, and the analyst's opinion, only.	Sector exclusion or inclusion not discussed accross the public information available.	The rating encourages the disclosure of scope 3 emissions and their management.	For instance, companies are not mandated to set GHG reduction targets.
FTSE Russel	FTSE ESG Scores	The assessment considers corporate reduction targets.	While stakeholders are not sollicited directly during the assessment process, the methodology states their opinion is integrated when methodology is reviewed.	This is not specified in the methodology.	The disclosure and management of scope 3 emissions are considered by the TPI methdology.	For instance, reducing emissions is not systematically mandatory for companies.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Inrate	ESG impact ratings	The assessment takes into account corporate policies, targets and initiatives to manage material sustainability issues.	There's insufficient information on the rating process to conclude that stakeholders are sollicited during the assessment, but methodology reviews includes solliciting research to ensure impacts are appropriately taken into account.	This is not specified in the methodology.	The assessment claims it takes into account the impact of the company's activity across its products livecycles.	For instance, companies are rated on their value-chain emissions levels which they are not systematically required to disclose nor reduce.
Insight Investment	Prime climate risk ratings	The rating takes into account emissions reduction targets and capacity to reduce emissions over time.	There's no mention of non financial stakeholders regarding methodology building or input data sharing.	This is not specified in the methodology and exclusions screens are suggested as a complement to the rating.	Scope 3 emissions are taken into account.	For instance, reducing emissions is not systematically mandatory for companies.
	Prime ESG ratings	The rating takes into account emissions reduction targets and capacity to reduce emissions over time.	There's no mention of non financial stakeholders regarding methodology building or input data sharing.	This is not specified in the methodology and exclusions screens are suggested as a complement to the rating.	Emissions taken into account include both direct and indirect emissions.	For instance, companies are not systematically expected to reduce the share of products and services they sell that contribute to climate change.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
ISS / Oekom	ESG Corporate Rating	The assessment mentions SBTi as a source of standard for their assessment, they thus take into account whether corporation aim to align their emissions with the Paris Agreement.	ISS ESG plans to open public surveys for stakeholders to express their views on the methodological foundation of their assessment during the yearly methodology review.	This is not specified in the methodology.	Used indicators and assessment methodologies are not disclosed.	The assessment mentions SBTi as a source of standard for their assessment, it is thus likely they take into account whether corporation aim to align their emissions with the Paris Agreement, which is not mandated by law.
JUST Capital	Annual JUST capital corporation ranking	The scoring takes into account emission reduction targets.	The general public is sollicited randomly and representatively to gather scoring criteria and weightings.	All companies in the Russell 100 Index (expect exceptions based on size, geography and corporate structure) are ranked.	Scope 3 emissions (emissions both upstream and downstream the value chain) are taken into account.	For instance, companies are not systematically expected to commiting to reducing their emissions to align with the Paris Agreement.
MorningStar / Sustainanalytics	Low Carbon Transition Rating	The future evolution of corporate emissions is estimated on a scope by scope basis based on current management plans and processes.	The assessment is automated and uses only elements disclosed by the assessed company. Stakeholders are not mentionned regarding methodology updates.	This is not specified and oil and gas companies are rated, which is likely to be considered the most controversial sector for a low carbon transition rating.	The assessment includes corporate scope 3 emissions (value chain emissions).	For instance, corporations are expected to reduce their emissions, which is not mandated by law.

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Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
MSCI / KLD / Innovest	ESG Risk rating	The public documents do not state whether the risk assessment projects foreseeable emissions evolutions.	Stakeholders management is considered as part of the assessment but stakeholders do not contribute to defining the materiality of criteria.	This is not specified in the available documentation.	The list of datapoints used is not disclosed.	All companies are not expected by law to manage ESG related risks.
	Physical risk rating	The public documents do not state whether the risk assessment consider future company risk exposure.	This isn't relevant to the perimeter of the rating as it focuses on physical climate risk.	This isn't relevant to the perimeter of the rating as it focuses on physical climate risk, which are relevant regardless of the sector.	Both direct (on operations) and indirect (on other value chain actors) climate change exposure are accounted for.	All companies are not expected to systematically assess nor properly manage their climate related risks.
	MSCI Implied Temperature Rise	The rating compares corporate carbon trajectories with the remaining carbon budget to stay below 2°C of global warming.	This isn't relevant to the perimeter of the rating as it focuses only corporate reduction targets.	This is not specified and oil and gas companies are rated.	Rating takes into account corporate scope 3 emissions (emissions across the supply chain).	Corporations are expected to reduce their emissions, which is not mandated by law.
	MSCI ESG Rating	The methodology doesn't disclose the datapoints required nor how they are evaluated.	Stakeholders are not mentionned in the assessment or methodology update section of the MSCI rating process report.	This is not specified and oil and gas companies are rated.	Datapoints required are not fully disclosed and only direct emissions are mentionned.	Corporations are expected to reduce their emissions, which is not mandated by law.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	The methodology doesn't disclose the datapoints required nor how they are evaluated.	The scoring uses only publicly available information and does not specify stakeholders are sollicited during the methodology update process.	LSEG doesn't specify a list of excluded sectors, and states the socring covers 90% of market valuation.	Datapoints required for each pillar are not disclosed.	Datapoints required for each pillar are not disclosed.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
RepRisk	RepRisk Index	Information required focuses on current and past company performance ESG perception. No forward looking information is collected. Rater's response : Reprisk provided a full Jupyter notebook allowing a technical public to further discover their methodology and dataset. Note on rater's response : This confirmed our initial assessment.	While RepRisk collects information passively and does not interact with stakeholders directly, the information collected relates to stakeholder perception (NGO reports, media coverage, etc). It is unclear whether this correlates with actual stakeholder opinion. Rater's response : Reprisk provided a full Jupyter notebook allowing a technical public to further discover their methodology and dataset. Note on rater's response : This confirmed our initial assessment. Stakeholders are not mentioned in the rating process.	Any company can be ranked, as soon as the algorithm detects an incident. Rater's response : Reprisk provided a full Jupyter notebook allowing a technical public to further discover their methodology and dataset. Note on rater's response : This confirmed our initial assessment.	There's no specific information available on whether and how supply chain incidents are taken into account for each company. However, Reprisk lists "Supply chain issues" as part of the ESG issues considered.	For instance, a company not complying with the UN's Global Compact's 10 principles is considered an ESG incident.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
RepTrak	ESG Perception & Global RepTrak 100	Information required focuses on current company performance ESG perception.	The general public is sollicited randomly to gather the data used for the scoring.	All companies with sufficient public visibility and revenue are scored.	There's no information available on whether supply chain reputation incidents are taken into account for each company.	Input data is related to the public perception of brands. The scoring process doesn't evaluate the performance of companies.
SAM / S&P Global / Trucost	S&P Global ESG Score	No information relative to corporate emissions reduction strategy is requested.	The weighting of issues is based on a double materiality assessment, but the methodology doesn't specify to what extent stakeholders are contacted when assessing outgoing materiality.	The score results cover 99% of Global Market capitalization and S&P doesn't specify a list of excluded sectors.	Indirect value chain emissions levels are requested and used as an indicator.	For instance, the scoring takes into account whether the companies uses the voluntary Task Force on Climate-related Financial Disclosures framework to disclose climate related risks.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
	Climate Transition Assessment	The rating takes into account the corporation's climate transition plan to assess how compatible with 1.5°C average global warming the business will be.	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. In particular, the public documents do not contain any mention of contacting stakeholders. Rater's response : "Company engages S&P Global Ratings for the assessment and provides inputs. See FAQ which includes how the process works FAQ: Applying Our Integrated Analytical Approach For Climate Transition Assessments	S&P Global Ratings (spglobal.com)." Note on rater's response : While the FAQ indeed shows companies are offered an opportunity to review and discuss results, it does not mention other stakeholders. We maintain our assessment.	Any company can receive a rating upon request.	S&P discloses a brief overview of the principles behind the rating but the criteria or approaches aren't fully disclosed. Rater's response : "Value chain considerations are embedded in the shading methodology. See Analytical Approach for CTA (Analytical Approach: Climate Transition Assessments	S&P Global Ratings (spglobal.com)) and underlying Shades of Green methodology (Analytical Approach: Shades Of Green Assessments	S&P Global Ratings (spglobal.com))." Note on rater's response : "Indeed, this is supported by the additional documents provided, we updated our assessment."	The assessment takes into account the corporation's climate transition plan which is not systematically mandated by regulation.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
SBTi	Science Based Targets labels	SBTi validates corporate emissions reduction targets against the Paris Agreement. Note however, that while brief information on emission reduction plan to meet targets is required, it is unlikely this information is sufficient to determine whether the company will reach its target.	This isn't relevant to the perimeter of the rating as it focuses only corporate reduction targets.	All sectors can submit targets, although high-emission sectors are required to comply with more ambitious target levels.	The indirect emissions stemming from the company's value chain are included in required targets, with an exception for SME for which scope 3 target setting is voluntary.	Ambitious emissions reduction commitments are typically not mandated by law.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
SSI	ESG Rating	The methodology lists the GHG emissions reduction roadmap as a required datapoint.	The system is an automated rating based on scrapped data only. The yearly methodology review doesn't mention including stakeholder outside experts. Rater's response : "We update data, score and ratings only if there is incorrect data. Listed companies have to provide publicly available supporting document if they want to correct certain data." Note on rater's response : This confirms our initial assessment.	This is not specified in the documentation and the ratings claims more they reach more than 95% market value coverage. Rater's response : "We have full coverage on A-share companies. For HK-listco, we cover the largest listed companies by market cap. We do not exclude any sectors on purpose." Note on rater's response : This confirms our initial assessment.	While supply chain specific data is required, it seems to revolve around supplier risk management and supply chain collaboration. It is unclear whether impacts listed as datapoints (Greenhouse gas emissions for instance) should include value chain impacts. Rater's response : "Supply chain metrics revolve around supplier risk management and sustainable supply chain. For example, Scope 3 GHG intensity is included in our metrics under Climate Change Theme." Note on rater's response : This is not specified on any public document found or provided. We maintain our initial assessment.	For instance, requiring a GHG emissions roadmap is not mandated by law. Rater's response : "Scope 3 GHG intensity and ESG data verification are encouraged by regulators but mandatory in our scoring model." Note on rater's response : This confirms our initial assessment.

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
	Carbon neutrality rating	The assessment takes into account the adequacy of the company's internal policies and management strategies aimed at achieving carbon neutrality	The methodology states that "China Securities Index actively engages with stakeholders, including companies, investors, environmental organizations, and regulatory bodies" to ensure the scoring methodology answers their needs and concerns.	This is not specified in the documentation and the scope of the rating is defined as any issuer of Chinese securities. Rater's response : "We have full coverage on A-share companies. For HK-listco, we cover the largest listed companies by market cap. We do not exclude any sectors on purpose." Note on rater's response : This confirms our initial assessment.	It is unclear whether impacts listed as datapoints (Greenhouse gas emissions for instance) should include value chain impacts. Rater's response : "Supply chain metrics revolve around supplier risk management and sustainable supply chain. For example, Scope 3 GHG intensity is included in our metrics under Climate Change Theme." Note on rater's response : This is not specified on any public document found or provided. We maintain our initial assessment.	For instance, companies are evaluated on their renewable energy usage, which is not mandated by law. Rater's response : "Scope 3 GHG intensity and ESG data verification are encouraged by regulators but mandatory in our scoring model." Note on rater's response : This confirms our initial assessment.

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Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
SynTao Green Finance	SynTao ESG Rating	Datapoints required are not disclosed.	The system is an automated rating based scrapped data. The public documents available don't mention stakeholders are included for the methodology review.	The scoring systems covers all companies listed in Mainland China & Hong-Kong.	Datapoints required are not disclosed.	For instance, companies are evaluated based on the implementation of a "climate change management system", why is not systematically mandated by law.
ZKB Sustainability Research	Swisscanto Sustainability rating	Datapoints required are not disclosed.	The system is an automated rating based on public data only. There is no mention of methodology updates in the available documentation.	The bank follows the blacklist of the Swiss Association for Responsible Investments.	The methodology states scope 3 emissions are not taken into account due to poor data quality and lack of standardization.	Companies are put in competition according to their GHG intensity, which is not systematically mandatory by law.

Table 10: Supplementary table to clarify the assessment of scoring systems on fairness and efficiency criteria. Criteria can be identified by referring to Table 1.

Actor	Scoring name	Specificity	Progress	Support
3BL Media	100 Best Corporate Citizens	The methodology and FAQ do not mention sector, size or geography specific perimeters or criteria weighting.	Criteria are updated yearly, but changes to the 2024 methodology on climate change appear to be clarifications. Additionally, since full methodology is not available, it's not clear how weighting has evolved.	The system is an automated rating based on ISS data only.
ADEME ACT Solutions	ACT rating	The initiative developed industry specific methodologies.	The assessment is absolute.	Assessment can be offered as part of a consulting mission. Rater's reponse : Further, methodology descriptions are sufficiently transparent and detailed to allow companies to draw conclusions on how to improve. Note on rater's reponse : We agree this contributes to driving corporate climate action and maintain our assessment.

Actor	Scoring name	Specificity	Progress	Support
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	Analysis is based on KPIs and weightings specific for each industry.	The methodology is reviewed on a biannual basis, without specifications on raising expectations.	Not specified in available documentation.
BLab	B Corp Label	Criteria depend on both company size and sector. Further tailoring is accessible upon request and justification and is analyzed on a case by case basis.	Upon certification, companies are expected to choose improvement targets and improve upon them for their next annual recertification.	BCorp provides tools and documentation for companies to improve their score.
Bloomberg	Bloomberg ESG Rating	Companies are pooled according to their business models, products and services, supply chains, clients and risks into industries.	While methodology is reviewed yearly to ensure alignment with latest sustainability disclosures practices and standards, it's unclear whether this systematically results in raising ambition levels. Bloomberg emphasized as a response that, given disclosure rates grow year over year, their assessment is mechanically made more ambitious, although this is not by design. Given the uncertainty of the continuation in the raise of climate disclosure, we maintain our assessment.	Scoring is automated, Bloomberg doesn't engage with companies.

Actor	Scoring name	Specificity	Progress	Support
Bloomberg	UN SDG Impact Materiality	Companies are rated based on their activity.	The assessment does not require threshold values.	Scoring is automated, Bloomberg doesn't engage with companies.
Carbon Disclosure Project	CDP Climate Score	Questionnaire varies based on company size (upcoming SME scoring in 2025) and their activity.	CDP states that it raises the bar continually so that companies continue evolving in their environmental journey.	Companies can generate reporting guidance for every question applicable to them but further guidance on how to enhance their strategy is not available.
Carbone 4	Compatibility score with the Paris Agreement	Assessment is differentiated according to the company's industry.	The assessment is absolute.	The assessment is part of a wider consulting service that then helps companies update their business plan to become Paris Aligned.
Climateaction 100	Net Zero Company Benchmark	Methodology depends on the industry, with specific industry getting audited on specific elements requested by their suppliers.	Criteria are updated yearly based on discussion with the investment conglomerate, but there is no guarantee that criteria will be made more ambitious.	The process includes direct discussion between companies from their investors, but it's unclear how this is conducted and whether this includes support in building a CSR strategy.
Corporate Accountability	Corporate Hall of Shame	All sectors, geographies and companies sizes are put in competition for a position in the corporate hall of shame.	The score process doesn't include any criteria.	Rating occurs without seeking inputs from companies.

Actor	Scoring name	Specificity	Progress	Support
Corporate Knights	The Global 100 list	Companies are rated relatively to their industry's performance.	Criteria are updated yearly, but there is no guarantee that criteria will be made more ambitious.	Rating occurs without seeking inputs from companies except for information verification.
EcoVadis	Ecovadis Medals and Badges	The Ecovadis questionnaire and scoring method is customized according to company size, industry and geographical location.	The methodology states a methodology committee meets quarterly to review and update the assessment methodology based on latest best sustainability practices. This effectively makes the scoring more ambitious yearly, assuming corporate best practices improve.	Companies receive scorecards that detail their performance and improvement options.
	Carbon rating	The Ecovadis carbon questionnaire and scoring method is customized according to company size and industry.	The methodology states a methodology committee meets quarterly to review and update the assessment methodology based on latest best sustainability practices. This effectively makes the scoring more ambitious yearly, assuming corporate best practices improve.	Companies receive scorecards that detail their performance and improvement options.

Actor	Scoring name	Specificity	Progress	Support
FTSE Russel	FTSE ESG Scores	Indicators are tailored according to the company's geography and activity.	The scoring methodology is reviewed yearly to account for stakeholder feedback and regulation evolution. It is unclear whether this systematically results in raising the ambition of the rating.	The assessment process is automated based on public information.
Inrate	ESG impact ratings	The weighting of criteria is differentiated according to industry.	The website states that the methodology is regularly updated to "keep up with the most pressing issues of our time". This effectively makes the scoring more ambitious yearly, assuming issues are gradually identified.	The rating process remains unclear and doesn't specify whether rated companies are offered documentation.
Insight Investment	Prime climate risk ratings	Indicators weightings are adjusted according to the company's industry and geography.	Methodology updates are not mentioned in the available public documents.	Insight insist ratings often result in proactive engagement and dialogue with rated companies to ensure risk are more appropriately managed or to encourage change in corporate behavior. It is unclear how systematic this is.

Actor	Scoring name	Specificity	Progress	Support
ISS / Oekom	Prime ESG ratings	Indicators weightings are adjusted according to company industry.	Methodology updates are not mentionned in the available public documents.	Insight insist ratings often result in proactive engagement and dialogue with rated companies to ensure risk are more appropriately managed or to encourage change in corporate behavior. It is unclear how systematic this is.
	ESG Corporate Rating	ISS ESG takes into account industry and size to define material issues and performance thresholds and geography to infer basic behavior from companies based on local legislation.	Methodology updates are scheduled yearly and take into account regulatory developments, existing and emerging disclosure standards, increasing stakeholder expectations, academic research, and scientific and technological developments. Assuming standards and regulations are made more ambitious each year, this effectively raises the rating's ambition yearly.	Companies are implicated in the rating process as they are asked to review preliminary ratings and eventually provide supplementary information to challenge public data. Results are also shared with the rated company, but it's unclear if they include any documentation.
JUST Capital	Annual JUST capital corporation ranking	The ranking adapts some indicators based on both geography and industry.	The ranking methodology is updated yearly based on the yearly results to a public sollicitation survey. This hasn't resulted in more ambitious rating criteria over the last assessment years.	Just Capital engages with rated companies to ensure they understand the methodology and analysis and get feedback on their ESG performance.

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Actor	Scoring name	Specificity	Progress	Support
MorningStar / Sustainanalytics	Low Carbon Transition Rating	Companies' emissions are assessed against geography and industry specific reduction targets from the UN's Inevitable Policy Response (IPR).	The assessment is absolute.	The rating systems does not involve rated companies.
	ESG Risk rating	The scoring differentiates criteria according to company industry.	The scoring methodology states the process is reviewed yearly to reassess data points and issue materiality to adapt to the changing operational realities of companies. Assuming CSR strategy uptake in companies, the scoring is thus made more ambitious each year.	The rating systems does not involve rated companies.
	Physical risk rating	The assessment takes into account the geography of companies to determine their exposure.	The assessment is absolute.	The rating systems does not involve rated companies.
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	All corporate trajectories are assessed against the Global carbon budget not to exceed 2°C.	The assessment is absolute.	The rating systems does not involve rated companies.

Actor	Scoring name	Specificity	Progress	Support
Refinitiv / Asset4 / Thomson & Reuters	MSCI ESG Rating	MSCI ESG ratings are industry and geography specific.	The scoring methodology states the assessment approach is reviewed quarterly and updated annually by consulting investors and corporate issuers. This does not ensure criteria are made more ambitious.	The methodology only states MSCI is committed to transparent communication with rated companies and does not specify it will provide feedback nor recommendations.
	ESG Score	The weighting of datapoints varies according to industries.	No information on methodology updates is provided.	The rating systems does not involve rated companies.
RepRisk	RepRisk Index	No information available on whether risk classification is industry, size or geography dependent. Rater's response : Reprisk provided a full Jupyter notebook allowing a technical public to further discover their methodology and dataset. Note on rater's response : The document clearly states "There is no weighting of the ESG Issues e.g., by sector or country". We updated our assessment accordingly.	Reprisk's ESG scoring systems measure media coverage of a company's ESG performance. Assuming the media is more sensitive to ESG issues each year, scoring is thus made more ambitious yearly.	The rating systems does not involve rated companies.

Actor	Scoring name	Specificity	Progress	Support
RepTrak	ESG Perception & Global RepTrak 100	Reptrak adjust their methodology based on industry.	Reptrack's ESG scoring systems measure how stakeholder view a company's ESG performance. Assuming the public is more sensitive to ESG issues each year, scoring is thus made more ambitious yearly.	The rating systems does not involve rated companies unless they pay to access platform and analyze results.
SAM / S&P Global / Trucost	S&P Global ESG Score	The scoring system includes 62 industry-specific questionnaires.	The methodology states criteria are updated yearly to reflect latest trends in sectoral materiality assessments. Assuming further material issues are discovered each year, scoring is thus made more ambitious each year.	S&P provides extensive guidance on how to answer their questions in their CSR handbook.

Actor	Scoring name	Specificity	Progress	Support
	Climate Transition Assessment	The assessment is differentiated according to the corporations' industry.	The rating is absolute thus the expectations for companies are not raised year-on-year. Rater's response : " The rating is absolute, however companies are encouraged to get a yearly update to track progress, and when the CTA is used for alignment to exchanges green equity designations (Nasdaq, B3, SIX) annual updates are required." Note on rater's response : The criterion refers to the ability of scorings to drive year-on-year improvements for companies by raising expectations yearly. We thus maintain our initial assessment.	The rating is part of a service that offers feedback and suggestion on how to improve climate transition plans. Rater's response : "The assessments are solicited, methodology is publicly available. However, this is not a consulting service and companies are not coached on how to achieve a higher assessment level." Note on rater's response : Indeed, after review of publicly available report, it appears no counseling is provided on how to improve the outlook. We updated our assessment accordingly.
SBTi	Science Based Targets labels	Minimum targets levels are differentiated according to company sizes and industry.	The rating is absolute thus the expectations for companies are not raised year-on-year.	Companies receive feedback when their application has been reviewed.

Actor	Scoring name	Specificity	Progress	Support
SSI	ESG Rating	Weighting is differentiated according to industry.	Methodology is regularly reviewed by an expert committee, but it remains unclear how it evolves year-on-year. Rater's response : "We closely monitor the development of ESG disclosure and will update our criteria if needed. Methodology is regularly reviewed by an expert committee." Note on rater's response: This does not support the idea of the criteria being made more ambitious year-on-year.	The system is an automated rating based on scrapped data only. Rater's response : "Listed companies can see their detailed score via our SMART ESG platform or detailed soft copy ESG rating report. The platform or rating report shows ESG metrics, the input data and output score, which helps companies get to know what data is expected to be disclosed and how the data is compared with peers." Note on rater's response : The response does not mention supporting documentation on how to meet criteria and is not supported by public documents found or provided.

Actor	Scoring name	Specificity	Progress	Support
	Carbon neutrality rating	Final score is standardized based on industry performance.	Methodology is regularly reviewed by an expert committee and stakeholders, but it remains unclear how it evolves year-on-year. Rater's response : "We closely monitor the development of ESG disclosure and will update our criteria if needed. Methodology is regularly reviewed by an expert committee." Note on rater's response: This does not support the idea of the criteria being made more ambitious year-on-year.	The system is an automated rating based on scrapped data only. Rater's response : "Listed companies can see their detailed score via our SMART ESG platform or detailed soft copy ESG rating report. The platform or rating report shows ESG metrics, the input data and output score, which helps companies get to know what data is expected to be disclosed and how the data is compared with peers." Note on rater's response : The response does not mention supporting documentation on how to meet criteria and is not supported by public documents found or provided.
SynTao Green Finance	SynTao ESG Rating	Weightings are adjusted according to industries.	There is no mention of methodology updates on the company's website.	The system is an automated rating based scrapped data.
ZKB Sustainability Research	Swisscanto Sustainability rating	ESG evaluation criteria and weights are industry specific.	There is no mention of methodology updates in the available documentation.	The system is an automated rating based on public data only.

Appendix

Table 11: Supplementary table for the assessment of scoring systems on Reliability criteria. Criteria can be identified by referring to Table 1. FALSE means the scoring failed the criterion, TRUE the scoring passed the criterion, ? there is insufficient public information to assess the score on the criterion and N/A the criterion doesn't apply to the score. This table is completed by Tables 12, 13, 14.

Actor	Scoring Name	Transparency	Independency	Standardisation	Verification
3BL Media	100 Best Corporate Citizens	FALSE	TRUE	FALSE	?
ADEME ACT Solutions	ACT rating	TRUE	TRUE	Partial	?
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	FALSE	Partial	?	?
BLab	B Corp Label (2025 standard)	TRUE	FALSE	Partial	TRUE
Bloomberg	ESG Score	Partial	TRUE	Partial	FALSE
Bloomberg	UN SDG Impact Materiality	Partial	TRUE	TRUE	FALSE
Carbon Disclosure Project	CDP Climate Score	TRUE	FALSE	Partial	FALSE
Carbone 4	Compatibility score with the Paris Agreement	TRUE	FALSE	TRUE	?

Actor	Scoring Name	Transparency	Independency	Standardisation	Verification
Climateaction 100	Net Zero Company Benchmark	TRUE	TRUE	Partial	FALSE
Corporate Accountability	Corporate Hall of Shame	Partial	TRUE	FALSE	N/A
Corporate Knights	The Global 100 list	TRUE	TRUE	TRUE	Partial
EcoVadis	Ecovadis Medals and Badges	Partial	FALSE	Partial	TRUE
	Carbon rating	Partial	FALSE	Partial	TRUE
FTSE Russel	FTSE ESG Scores	FALSE	TRUE	FALSE	?
Inrate	ESG impact ratings	FALSE	TRUE	?	?
Insight Investment	Prime climate risk ratings	FALSE	TRUE	?	?
Insight Investment	Prime ESG ratings	FALSE	TRUE	?	?
ISS / Oekom	ESG Corporate Rating	Partial	TRUE	Partial	FALSE
JUST Capital	Annual JUST capital corporation ranking	TRUE	TRUE	FALSE	?

Actor	Scoring Name	Transparency	Independency	Standardisation	Verification
MorningStar / Sustainan-alytics	Low Carbon Transition Rating	FALSE	FALSE	?	?
	ESG Risk rating	FALSE	FALSE	?	?
	Physical risk rating	FALSE	FALSE	?	?
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	TRUE	TRUE	Partial	FALSE
	MSCI ESG Rating	FALSE	TRUE	?	?
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	FALSE	TRUE	?	?
RepRisk	RepRisk Index	FALSE	TRUE	FALSE	N/A
RepTrak	ESG Perception & Global RepTrak 100	FALSE	FALSE	?	N/A
SAM / S&P Global / Trucost	S&P Global ESG Score	TRUE	FALSE	Partial	Partial
	Climate Transition Assessment	Partial	FALSE	FALSE	?

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Actor	Scoring Name	Transparency	Independency	Standardisation	Verification
SBTi	Science Based Targets labels	TRUE	FALSE	TRUE	FALSE
SSI	ESG Rating	FALSE	?	Partial	FALSE
	Carbon neutrality rating	FALSE	?	Partial	Partial
SynTao Green Finance	SynTao ESG Rating	FALSE	?	?	FALSE
ZKB Sustainability Research	Swisscanto Sustainability rating	FALSE	Partial	?	?

Table 12: Supplementary table for the assessment of scoring systems on Accuracy criteria 5 to 9. Criteria can be identified by referring to Table 1. FALSE means the scoring failed the criterion, TRUE the scoring passed the criterion, ? there is insufficient public information to assess the score on the criterion and N/A the criterion doesn't apply to the score. This table is completed by Tables 13, 14.

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
3BL Media	100 Best Corporate Citizens	FALSE	FALSE	FALSE	?	?
ADEME ACT Solutions	ACT rating	FALSE	FALSE	TRUE	Partial	TRUE

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	FALSE	FALSE	?	?	?
BLab	B Corp Label (2025 standard)	TRUE	TRUE	TRUE	?	FALSE
Bloomberg	ESG Score	Partial	Partial	FALSE	TRUE	TRUE
Bloomberg	UN SDG Impact Materiality	TRUE	TRUE	FALSE	TRUE	TRUE
Carbon Disclosure Project	CDP Climate Score	FALSE	FALSE	TRUE	FALSE	FALSE
Carbone 4	Compatibility score with the Paris Agreement	TRUE	FALSE	TRUE	TRUE	TRUE
Climateaction 100	Net Zero Company Benchmark	TRUE	TRUE	TRUE	?	FALSE
Corporate Accountability	Corporate Hall of Shame	?	N/A	FALSE	FALSE	TRUE
Corporate Knights	The Global 100 list	FALSE	FALSE	FALSE	FALSE	TRUE
EcoVadis	Ecovadis Medals and Badges	FALSE	Partial	FALSE	?	FALSE

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Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
	Carbon rating	FALSE	FALSE	TRUE	?	FALSE
FTSE Russel	FTSE ESG Scores	FALSE	FALSE	FALSE	TRUE	TRUE
Inrate	ESG impact ratings	FALSE	?	?	?	TRUE
Insight Investment	Prime climate risk ratings	Partial	Partial	?	TRUE	?
Insight Investment	Prime ESG ratings	Partial	FALSE	?	TRUE	TRUE
ISS / Oekom	ESG Corporate Rating	Partial	FALSE	TRUE	TRUE	?
JUST Capital	Annual JUST capital corporation ranking	TRUE	FALSE	TRUE	FALSE	TRUE
MorningStar / Sustainanalytics	Low Carbon Transition Rating	FALSE	FALSE	TRUE	FALSE	TRUE
	ESG Risk rating	Partial	FALSE	?	TRUE	?
	Physical risk rating	TRUE	TRUE	FALSE	TRUE	N/A

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	N/A	N/A	TRUE	N/A	FALSE
Refinitiv / Asset4 / Thomson & Reuters	MSCI ESG Rating	Partial	FALSE	FALSE	TRUE	?
	ESG Score	Partial	FALSE	FALSE	Partial	?
RepRisk	RepRisk Index	FALSE	FALSE	FALSE	?	?
RepTrak	ESG Perception & Global RepTrak 100	FALSE	FALSE	FALSE	FALSE	?
SAM / S&P Global / Trucost	S&P Global ESG Score	Partial	FALSE	FALSE	TRUE	TRUE
	Climate Transition Assessment	?	FALSE	TRUE	TRUE	TRUE
SBTi	Science Based Targets labels	N/A	N/A	TRUE	N/A	TRUE
SSI	ESG Rating	Partial	FALSE	FALSE	TRUE	?

Actor	Scoring name	Weighting	Compensation	Relativity	Immateriality	Impact
	Carbon neutrality rating	FALSE	FALSE	FALSE	?	TRUE
SynTao Green Finance	SynTao ESG Rating	FALSE	FALSE	FALSE	TRUE	FALSE
ZKB Sustainability Research	Swisscanto Sustainability rating	FALSE	FALSE	?	TRUE	TRUE

Table 13: Supplementary table for the assessment of scoring systems on Accuracy criteria 10 to 14. Criteria can be identified by referring to Table 1. FALSE means the scoring failed the criterion, TRUE the scoring passed the criterion, ? there is insufficient public information to assess the score on the criterion and N/A the criterion doesn't apply to the score. This table is completed by Table 14.

Table 13: Evaluation of Criteria 10 to 14

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
3BL Media	100 Best Corporate Citizens	FALSE	FALSE	Partial	TRUE	TRUE
ADEME ACT Solutions	ACT rating	TRUE	Partial	FALSE	TRUE	TRUE
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	?	Partial	TRUE	TRUE	?

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
BLab	B Corp Label (2025 standard)	TRUE	?	TRUE	TRUE	TRUE
Bloomberg	ESG Score	TRUE	TRUE	TRUE	TRUE	FALSE
Bloomberg	UN SDG Impact Materiality	FALSE	?	Partial	TRUE	TRUE
Carbon Disclosure Project	CDP Climate Score	TRUE	FALSE	FALSE	TRUE	TRUE
Carbone 4	Compatibility score with the Paris Agreement	FALSE	FALSE	FALSE	TRUE	TRUE
Climateaction 100	Net Zero Company Benchmark	TRUE	Partial	FALSE	TRUE	TRUE
Corporate Accountability	Corporate Hall of Shame	FALSE	Partial	N/A	Partial	N/A
Corporate Knights	The Global 100 list	FALSE	FALSE	TRUE	Partial	TRUE
EcoVadis	Ecovadis Medals and Badges	TRUE	FALSE	TRUE	Partial	TRUE
	Carbon rating	TRUE	FALSE	?	TRUE	TRUE
FTSE Russel	FTSE ESG Scores	TRUE	Partial	?	TRUE	TRUE

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Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Inrate	ESG impact ratings	TRUE	Partial	?	TRUE	TRUE
Insight Investment	Prime climate risk ratings	TRUE	?	FALSE	TRUE	TRUE
Insight Investment	Prime ESG ratings	TRUE	?	FALSE	TRUE	TRUE
ISS / Oekom	ESG Corporate Rating	TRUE	Partial	?	?	TRUE
JUST Capital	Annual JUST capital corporation ranking	TRUE	TRUE	FALSE	TRUE	TRUE
MorningStar / Sustainanalytics	Low Carbon Transition Rating	TRUE	FALSE	FALSE	TRUE	TRUE
	ESG Risk rating	?	Partial	?	?	TRUE
	Physical risk rating	?	N/A	N/A	TRUE	TRUE
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	TRUE	N/A	FALSE	TRUE	TRUE
	MSCI ESG Rating	?	FALSE	FALSE	?	TRUE

Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	?	FALSE	FALSE	?	?
RepRisk	RepRisk Index	FALSE	Partial	FALSE	TRUE	TRUE
RepTrak	ESG Perception & Global RepTrak 100	FALSE	TRUE	FALSE	?	N/A
SAM / S&P Global / Trucost	S&P Global ESG Score	FALSE	?	FALSE	TRUE	TRUE
	Climate Transition Assessment	TRUE	?	FALSE	TRUE	TRUE
SBTi	Science Based Targets labels	TRUE	N/A	FALSE	Partial	TRUE
SSI	ESG Rating	TRUE	FALSE	FALSE	?	TRUE
	Carbon neutrality rating	TRUE	TRUE	FALSE	?	TRUE
SynTao Green Finance	SynTao ESG Rating	?	FALSE	FALSE	?	TRUE

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Actor	Scoring name	Forward look	Stakeholders	Sector exclusion	Value chain	Regulation
ZKB Sustainability Research	Swisscanto Sustainability rating	?	FALSE	TRUE	FALSE	TRUE

Table 14: Supplementary table for the assessment of scoring systems on Fairness and Efficiency criteria. Criteria can be identified by referring to Table 1. FALSE means the scoring failed the criterion, TRUE the scoring passed the criterion, ? there is insufficient public information to assess the score on the criterion and N/A the criterion doesn't apply to the score.

Actor	Scoring Name	Specificity	Progress	Support
3BL Media	100 Best Corporate Citizens	FALSE	?	FALSE
ADEME ACT Solutions	ACT rating	TRUE	N/A	TRUE
Bank Sarasin & Co Ltd.	J. Safra Sarasin ESG Rating	TRUE	?	?
BLab	B Corp Label (2025 standard)	TRUE	TRUE	TRUE
Bloomberg	ESG Score	?	FALSE	FALSE
Bloomberg	UN SDG Impact Materiality	TRUE	N/A	FALSE

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Actor	Scoring Name	Specificity	Progress	Support
Carbon Disclosure Project	CDP Climate Score	TRUE	TRUE	Partial
Carbone 4	Compatibility score with the Paris Agreement	TRUE	N/A	TRUE
Climateaction 100	Net Zero Company Benchmark	TRUE	?	?
Corporate Accountability	Corporate Hall of Shame	FALSE	N/A	FALSE
Corporate Knights	The Global 100 list	TRUE	?	FALSE
EcoVadis	Ecovadis Medals and Badges	TRUE	Partial	TRUE
ECPI	Carbon rating	TRUE	Partial	TRUE
FTSE Russel	FTSE ESG Scores	TRUE	?	FALSE
Inrate	ESG impact ratings	TRUE	Partial	?
Insight Investment	Prime climate risk ratings	TRUE	?	Partial
Insight Investment	Prime ESG ratings	TRUE	?	Partial

Actor	Scoring Name	Specificity	Progress	Support
ISS / Oekom	ESG Corporate Rating	TRUE	Partial	?
JUST Capital	Annual JUST capital corporation ranking	TRUE	FALSE	TRUE
MorningStar / Sustainan-alytics	Low Carbon Transition Rating	TRUE	N/A	FALSE
	ESG Risk rating	TRUE	Partial	FALSE
	Physical risk rating	TRUE	N/A	FALSE
MSCI / KLD / Innovest	MSCI Implied Temperature Rise	FALSE	N/A	FALSE
	MSCI ESG Rating	TRUE	?	?
Refinitiv / Asset4 / Thomson & Reuters	ESG Score	TRUE	?	FALSE
RepRisk	RepRisk Index	FALSE	Partial	FALSE

Actor	Scoring Name	Specificity	Progress	Support
RepTrak	ESG Perception & Global RepTrak 100	TRUE	Partial	Partial
SAM / S&P Global / Trucost	S&P Global ESG Score	TRUE	Partial	TRUE
	Climate Transition Assessment	TRUE	N/A	FALSE
SBTi	Science Based Targets labels	TRUE	N/A	TRUE
SSI	ESG Rating	TRUE	?	FALSE
	Carbon neutrality rating	TRUE	?	FALSE
SynTao Green Finance	SynTao ESG Rating	TRUE	?	FALSE
ZKB Sustainability Research	Swisscanto Sustainability rating	TRUE	?	FALSE