

ESG Investing: Environmental Pillar Scoring and Reporting



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Foreword

Forms of sustainable finance have grown rapidly in recent years, as a growing number of institutional investors and funds now incorporate various Environmental, Social and Governance (ESG) investing approaches. This growth has been spurred by shifts in demand from across the finance ecosystem, driven both by the search for better long-term financial value, and a pursuit of better alignment with values.

Within this, the extent to which environmental (E) pillar scoring and investing reflect the environmental impact, carbon footprint and resource use of these investments is critical to help enable market participants to make informed decisions relating to a low carbon transition. This can include a strategic re-orientation towards renewables, climate-related risk management and adaptation, as well as operational processes to improve water use, waste management and impact on biodiversity.

This report assesses the landscape of criteria and measurement within the E pillar of ESG investing to better understand the extent to which E scores reflect outputs such as carbon emissions and core metrics that capture the negative effects of business activities on the environment, and to understand the impact of climate change to businesses. In doing this, the report aims to examine whether E scoring and reporting effectively serve markets and investors that are using ESG investing in part as a tool to make portfolios more resilient to physical and climate transition risks.

Findings suggest that E scoring may not necessarily be suitable for investors seeking to better align their portfolios with low carbon economies. Notably, E scores often do not align with current carbon emissions exposures, and can be difficult to interpret due to the multitude of diverse metrics on environmental factors. In fact, for some ESG rating providers, high E scores positively correlate with high carbon emissions, suggesting that the E score in its current form may not be an effective tool to differentiate between companies' activities related to outputs that affect the environment or support decarbonisation of portfolios. In addition, as market participants seek to understand their exposure to potential risks, the E score itself does not prioritise carbon footprint or intensity within the range of metrics that comprise the E score, so may be of limited value in protecting portfolios from climate transition risks such as stranded assets.

Despite these shortcomings, ESG scoring and reporting has the potential to unlock a significant amount of information on the management and resilience of companies, including environmental and physical climate-related risks, when pursuing long-term value creation. It could also represent an important market based mechanism to help investors make decisions on long term carbon prices and climate transition risks implied by climate change mitigation policies.

This report has been prepared to support the work of the OECD Committee on Financial Markets. It is part of a broader body of work to monitor developments in ESG rating and investing. The report and accompanying analysis has been prepared by Riccardo Boffo, Catriona Marshall and Robert Patalano from the OECD Directorate for Financial and Enterprise Affairs. It has benefited from comments from members of the OECD Committee on Financial Markets, Barbara Bijelic of the OECD Centre for Responsible Business Conduct and Robert Youngman and Geraldine Ang of the OECD Environment Directorate, with support by Karen Castillo. The report has been prepared for publication by Pamela Duffin and Edward Smiley.

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Executive summary

As market participants show greater awareness and concern that climate transition presents material and non-material financial risks to companies and a wider range of stakeholders, Environmental, Social, and Governance (ESG) investment products are increasingly being used as a tool to assess alignment with low carbon economies, climate-resilient transition pathways and to identify financially material environmental risks. To meet growing demand for this form of sustainable finance, ESG rating providers and investment funds are working to integrate metrics aligned with environmental resilience, climate risk mitigation, and strategies toward renewable energy among others. Recent work reviewed by the OECD's Committee on Financial Markets on *ESG Investing: Practices, Progress and Challenges* sought to assess the alignment of ESG investing with superior performance of risk-adjusted returns, and found little evidence of outperformance over the past decade. This report will build on this analysis, with a greater focus on the environmental (E) pillar of ESG investing to assess the extent to which E score methodologies in their current form align with the expectations of the investors and stakeholders that use them.

To put this in context, two important developments are occurring in sustainable finance¹ that relate to the purpose of ESG. First, there is a sharp growth of institutional investors using ESG approaches with the aim to enhance the long-term value of their investments, as measured by superior risk-adjusted financial returns. In this respect, incorporating risks from climate change and stranded assets as a result of the climate transition is increasingly recognised as a central element to this assessment.² Second, there is a growing commitment by institutional investors – whether motivated by financial or impact objectives – to strengthen the climate resilience of economies, corporations, portfolios and assets, in turn disincentivising carbon emissions. While ESG assessment methodologies of major ratings providers and global investors appear to strive to incorporate both financial performance and impact objectives, questions remain as to whether risk-adjusted financial returns or positive environmental impact are being achieved in practice.

To varying degrees, institutional investors and central banks are using ESG metrics and methodologies, and in turn the Environmental “E” score, to rebalance their portfolios in order to better incorporate climate risks, and in turn to facilitate a greening of the financial system. Numerous central banks in OECD countries are now also in the process of integrating ESG assessments into their investment approaches as one of several tools to better align portfolios with a transition to low-carbon, climate-resilient economies.³ Despite this, and as indicated by an internal OECD assessment of ESG integration in the report *ESG Investing: Practices, Progress and Challenges*, central banks have identified a number of challenges to further integrate ESG factors in the near-term. They range from methodological inconsistencies, lack of evidence of risk-adjusted returns, and questions over the extent to which ESG ratings align with climate transition and environmental objectives. Additionally, risk of higher volatility was also observed due to constraints such as exclusionary screening, with preliminary evidence of lower tail risk for higher ESG indices and funds. These challenges are compounded by questions on the quality, comparability and availability of ESG data, as well as lack of standardised ESG disclosures.

In order to address questions related to ESG investing and climate risks, this analytical report seeks to assess the extent of alignment between the E score and carbon dioxide (CO₂) emissions, as well as core metrics for factors that negatively affect the environment (such as waste or water). In addition, the report

seeks to understand how such E scores influence the emissions composition of high-ESG portfolios. The report uses data from key rating providers (Bloomberg, MSCI and Thomson Reuters)⁴ to analyse aspects of the E pillar that are attributed to the rating, to assess the extent to which high ESG scores, and high E scores in particular, are aligned with core environmental metrics (including carbon emissions and waste), which are closely related to efforts to tilt portfolios toward low-carbon investments. It then compares non-ESG and high ESG portfolios to assess the emissions content of both. Key findings are the following:

- For some of the ESG ratings providers analysed, there is a low correlation between the E score and the ESG score. While this is not unexpected, given that the E score is distinct, it confirms that investing in high-scoring ESG portfolios does not necessarily mean that such tilting includes companies that have received high ratings for managing their carbon emissions or risk management with respect to climate change.
- Also, while the E score includes a number of distinct environmental metrics, the analysis found a positive correlation between some ESG raters' high E scores⁵ of corporate issuers and high levels of carbon emissions and waste. This suggests that aspects of the E score other than key environmental metrics, such as climate risk management and governance, have greater weights in the methodologies that determine scores. This in itself can be valuable when management metrics help investors understand elements of long-term transition. Yet investors should take care not to misinterpret the information content of the E score as being aligned with low emissions, low-carbon portfolios or low-carbon transition. As a result, investing in high E scores may, in some cases, inadvertently result in a greater carbon footprint in portfolios.
- Beyond this, the results also show a positive correlation between transition policies adopted and the E pillar score for all three providers. This shows that long term policies are reflected in E pillar ratings in contrast to measures of negative environmental output, such as carbon emissions. This implies that such policies could be one of the main drivers of high E pillar scores. To this end, greater clarity and transparency is needed with respect to the methodologies used by rating providers, to ensure that investors fully understand what is driving high E scores.
- Furthermore, a review of several prominent high-ESG portfolios based on higher E scores found that *portfolios' exposures to the energy sector⁶ and other industries with a high emissions did not decrease, and in some cases materially increased*. Quantitative analysis indicates that the amount of emissions in these high-ESG portfolios is higher on a gross and average basis for some of the very large ESG funds. As such, this draws attention to the suitability of such funds for investors that wish to achieve risk-adjusted returns and reduce the carbon footprint of their portfolios.
- By contrast, other types of investment products, such as those tailored to climate transitions, may provide more targeted tools for investors to rebalance portfolios away from companies with carbon-intensive outputs or supply chains. However, highly tailored low-carbon or carbon-transition portfolios may have asset composition and risk characteristics that stray widely from standard market benchmarks that are most commonly used by institutional investors.

These findings illustrate the implications of having a wide variance in E scores and lack of alignment with emissions, which in turn raises questions as to the benefit of ESG portfolios – even with high E scores – for investors that prioritise low-carbon investments or carbon transition objectives. This wide variance is the result of the overall E score being a composite of metrics that capture companies' activities related to outputs that affect the environment, climate risk mitigation to improve risk-adjusted returns, and medium-term strategies to align portfolios with lower-carbon economies. As well, the subjective components that each rating provider fits into the ratings gives rise to questions on comparability, interpretability, and materiality. Consequently, the E of ESG investing – in its current form – may not be the most effective tool for investors who wish to use it to align portfolios with climate transition to low-carbon economies. The underlining metrics and framework can provide significant informational benefit, yet lack of comparability between environmental pillar ratings across providers is illustrative of a wider fragmentation in ESG markets as a whole, beyond just environmental or climate risk factors.

These findings motivated a second point of inquiry, which was to assess the landscape of rating categories and metrics within the E pillar that may drive both the wide range in scores and lack of alignment with company emissions and carbon transitions.⁷ The assessment first reviews the categories and metrics used by the three ESG rating agencies within their methodologies to generate E pillar scores. It then assesses the various corporate disclosure framework providers from which ESG rating providers have chosen categories and metrics to develop their methodologies. Key observations include the following:

Overall, rating providers tend to use similar metric *categories* from which the E pillar scores are generated, falling along the input-output-outcome-process chain. They focus on emissions and climate change, natural resource use, outputs and waste, combined with some form of forward looking category relating to transition to renewables or environmental opportunities.

- However, there are wide differences in the number and choice of quantitative metrics in metric subcategories, as well as the way in which individual metrics are calculated and weighed. These differences contribute to the wide variance of scores across providers, and also the lack of alignment between emissions and waste, and overall E scores.
- Methodologies such as best-in-class pillar weighting are used to recalibrate upward the rating of certain companies in high-emissions industries, such as energy. This practice, which allows for high and low scores in each industry to help reduce portfolio concentration, may also cause some companies with high emissions to nevertheless have relatively high E scores.⁸
- The use of different metrics by the different ratings agencies may also reflect their preference for certain approaches by ESG corporate reporting framework providers. As these providers have distinct missions that range from financial materiality, alignment with stakeholder values (e.g. on the SDGs), to specific climate risk assessment and mitigation; the ways in which elements of these reporting frameworks are incorporated and weighed influences the extent to which the E pillar aligns with low-carbon investments or other environmental metrics.

Looking ahead, for the E pillar to be an effective tool for investors with differing motivations; methodologies to generate E pillar scores may need to further develop to contain metrics that clearly align with financial materiality and environmental materiality in a mutually exclusive and transparent manner, so that investors have no doubt as to what is driving the E score.⁹ This will help strengthen the value of ESG investing for market participants, thereby ensuring financial resilience, as the assets under management of institutional investors that integrate ESG criteria into investment processes, continue to grow.

Introduction

Environmental, Social and Governance (ESG) investing has grown rapidly over the past decade, and the amount of professionally managed assets with ESG integration exceeded USD 18 trillion globally in 2019 (GSIA, 2019). Also, the growth of ESG-related traded investment products available to institutional and retail investors also exceeds USD 1 trillion and continues to grow quickly across major financial markets. In turn, institutional investors, asset managers and financial institutions are increasingly relying on third party rating and index providers to assess and measure ESG performance over time, as well as to compare peer companies.

Research conducted by the OECD on *ESG Investing: Practices, Progress and Challenges* explored the concepts and key actors in the ESG ecosystem, as well as challenges with respect to ESG ratings and fund categorisation, and performance of ESG indices and portfolios relative to financial performance. Findings suggest that ESG performance varies among providers and that the predictive power of ESG scores is inconsistent. Risk of higher volatility was also observed due to constraints such as exclusionary screening, with preliminary evidence of lower tail risk for higher ESG indices and funds.

ESG ratings and related products are progressing from an early stage of development, and therefore the rapid emergence of different reporting frameworks is to be expected. However, to ensure that financial market actors can operate on an informed basis, it is critical that transparent, accurate and comparable environmental, social and governance data is provided, used, and integrated into ESG ratings, and any related portfolio analysis, screening, or quantitative analysis.

In parallel, ESG integration is increasingly being used by institutional and retail investors as an avenue to express their desire to shift investments in line with a carbon transition. Initiatives such the Network for Greening the Financial System (NGFS) by central banks signals that public institutions are also seeking ways to incorporate environmental and climate related risks into investments, as one contributing step to realign the financial system toward low-carbon economies. The network notes their purpose is to “*enhance the role of the financial system to manage risks and to mobilise capital for green and low-carbon investments in the broader context of environmentally sustainable development.*”¹⁰ With a number of central banks citing the incorporation of ESG considerations (and by proxy E pillar considerations) within their responsible investment strategies to achieve this.¹¹ Therefore, the extent to which environmental scoring and reporting reflect the real impact of companies’ carbon footprint and resource use today, as well as longer-term management and transition strategies, is critical to help market participants make informed decisions that can contribute to these goals.

However, the lack of alignment with carbon emissions and general lack of comparability between E pillar ratings may limit the benefits of the E pillar as a tool to understand these impacts. For investors, this suggests that the E score may not be fit for purpose for investors who wish to utilise it as a proxy for a judgment of companies’ effect on the environment, with the scope of metrics taking into consideration a range of aspects, including those beyond emissions and carbon footprint. Similarly, opacity in the measurement of longer-term management and strategy metrics limit the E pillars use as a tool to assess companies’ commitment and strategies to manage a carbon transition. This in turn, raises concerns as to

the extent to which financial market participants have the data and tools that they need to manage environmental and carbon transition risks.

To be useful, E score methodologies should align with both financial materiality and environmental materiality in a mutually exclusive and transparent manner, so that investors have no doubt as to what is driving ESG scores. The impact of a company, industry or portfolio on the environment, through the use of non-renewable and natural resources as inputs into the factors of production or operations (e.g. water, minerals, ecosystems and biodiversity) is one factor of this. In addition, the harmful emissions released into the environment (such as air, land, and water) that may negatively affect natural resources should also be considered. Risk management and environmental policies also play a role, but should have a clear methodology for use. Methodologies that score companies positively based on superior risk management and renewable transition plans, despite poor performance on emissions and other metrics, merit further scrutiny. At the very least, these disparities in underlying metrics should be made transparent to the end user to reduce the risk of green-washing. This mix of requirements may make it more difficult for investors to interpret the meaning of environmental scoring and reporting on low-carbon transitions.

Despite these difficulties, different investors in capital markets have committed to green the financial system, including through the application of ESG ratings to their portfolios, or through investments in ESG funds. As these instruments may not sufficiently reflect important aspects of environmental sustainability, alternative investment products that more clearly focus on reducing portfolio exposure to carbon emissions, or more clearly promote green transitions, may be better suited to align investment strategies with transitions to low-carbon economies.

This report will address these issues through the following topics:

- **Section I** reviews how the integration of ESG ratings, with a focus on the E pillar, impacts the sustainability of portfolios. Metrics reflecting the real impact on climate, such as CO₂ emissions, will be analysed in order to understand how they relate to E scores. To this end, greater clarity and transparency is needed with respect to the methodologies used by rating providers, to ensure that investors understand the metrics and weightings that drive E scores.
- **Section II** provides analyses of ESG funds and indices constituents in the industries that emit the highest emissions to understand how they differ from the parent index. Findings suggest that more work is needed for E scores to reflect climate issues as some high E scores correlate to higher carbon emissions. Nonetheless, fund and bond alternatives are available for investors who are committed to shift to greener investing where there is more tangible and quantifiable impact.
- **Section III** outlines the metrics and related methodologies used by ESG rating providers mapping to what extent differences in their methodologies can explain the inconsistencies observed in Section I. Findings suggest that these differences may be a combination of the following: 1) differences in the scope of metrics, namely those outside of the core; 2) differences in measurement (i.e. absolute vs. relative) or of input indicators that build the metrics, and; 3) differences in weighting. Additionally, practices such as estimation in the case of missing data by providers may also exacerbate the three. More broadly, the subjectivity in determining metric weights and non-quantitative components of the ratings raise questions about comparability, interpretability, and materiality.
- **Section IV** explores how evolving corporate reporting frameworks, which include guidance on environmental and climate related metrics, contribute to the wide range of metrics used by major ESG raters. Frameworks such as those by the Task Force on Climate-related Financial Disclosures provide the basis for a large proportion of the emissions metrics used in E pillar scores across Bloomberg, MSCI and Thomson Reuters, with reporting frameworks such as the Sustainability Accounting Standards Board and Global Reporting Initiative providing guidance on metrics beyond emissions. Building on this, the section summarises the rationale and scope of the corporate reporting frameworks with the aim to outline their relevance in line with providing information that

is financially material, environmentally material and/or relevant for climate transition. Findings suggest that whilst Section I finds misalignment between E scores and emission metrics, this section delves deeper to better understand what metrics and methodologies may be driving these E scores. This section will also analyse the metrics and targets used for resource use, risk management, company strategies and the governance of environmental and climate related activities that may also be valuable for investors in order to understand medium-term transition risks.

- **Section V** introduces a preliminary view on implications, and outlines areas for further consideration with the aim to contribute to the wider discussion on environmental pillar scoring and reporting that feed into ESG rating and investing.

1. Measuring performance of the environmental pillar metrics in ESG rating and index methodology

Many institutional investors and fund managers around the world are paying greater attention to sustainable activities in their operations with the aim to address physical, liability and transition risks as a result of climate change.¹² ESG ratings and indices have in turn gained consideration as investment assessment tools to contribute to these activities, including to support a low carbon transition. As well, these concerns are being assessed by the public sector. International initiatives such as the Central Banks and Supervisors Network for Greening the Financial System (NGFS) have emerged with the aim to better align with transitions to low-carbon economies and enhance risk management associated with the transition and physical risks of climate change (NGFS, 2018).

Given the growing use of ESG ratings to support sustainable investment, the report seeks to understand how the Environmental pillar, and the derived ESG score, can be effectively used as a tool to achieve investors' objectives to incorporate climate and other environmental risks into their portfolio, and perhaps also to contribute to a transition to low-carbon economies. The motivation for doing so may be to enhance financial returns by reducing exposure to stranded assets and to companies that have exposure to transition risks from climate change. As well, investors may wish to actively contribute to the "greening" of the financial system by shifting investments to companies with ambitious renewable resource plans.

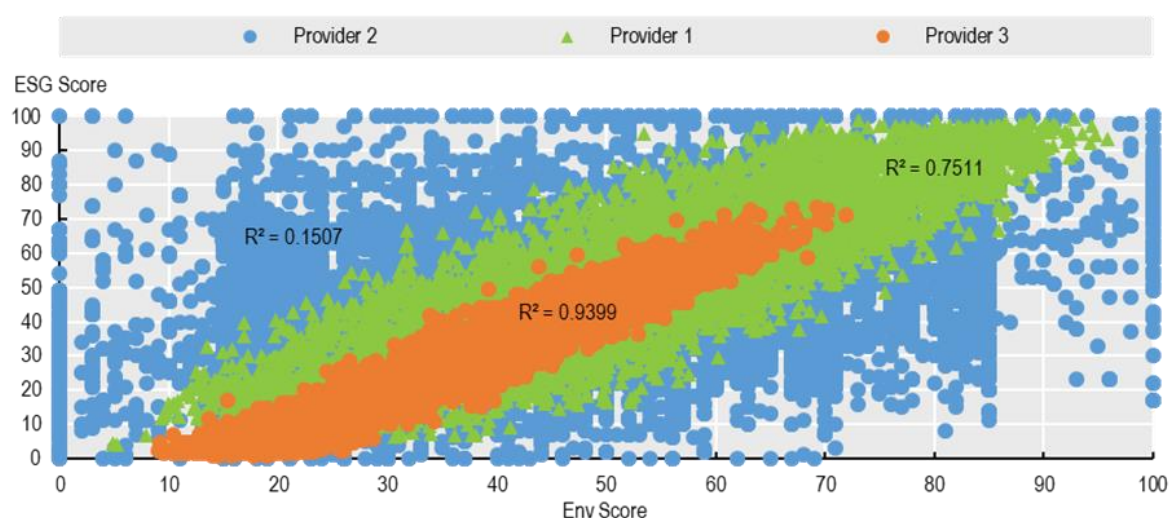
In this regard, it is important to note that different rating providers aim to give prominence to different goals: some providers are focusing more on the environmental assessment, giving higher weight to environmental issues, other providers consider prominent the financial materiality, while others focus on the disclosure and companies' reporting. This can influence how sustainability is reflected in the final ESG rating, which raises questions on what the standardisation of methodologies should look like.

The main aim of this is to assess (i) the extent to which the E of ESG measures companies' carbon emissions and other emissions that negatively impact the environment, and (ii) the extent to which these align with E scoring. To this end, the report assesses the extent to which using the E pillar as a driver for investments would make it possible to reduce the impact of carbon emissions on the environment. By contrast, the report does not attempt to derive an assessment of financial returns associated with E, as extensive analysis has been undertaken on this in the OECD's 2019 report on *ESG Investing: Practices, Progress and Challenges*.

Building on the findings that wide inconsistencies in ESG ratings can be observed, we analyse different providers' data (Bloomberg, MSCI and Thomson Reuters) with respect to the relationship between the Environmental pillar score and metrics related to carbon emissions and others that align with environmental impact.

The aim of this analysis is to shed light on the efficacy of sustainable investments. We compare the components of the E related to environmental impact to the overall E and ESG scores across firms, and by rating provider.

Figure 1. E pillar and ESG ratings' R squared for a global set of companies rated by different providers, World, 2019



Source: Bloomberg, MSCI, Refinitiv, OECD calculations

When comparing the E pillar against the overall ESG score as defined by the different rating providers to understand, at a basic level, if investors who want to align their investments with environmental values could do so through a selection of high-ESG rated companies. The comparison of ESG against Environmental Pillar scores shows a high R squared¹³ for two of the providers and a lower one for the remaining provider. This happens because of the differing methodologies with which the different providers build these scores. The results suggest that there is some scope for using ESG ratings to align with investors desire to focus on environmental standards. However, it clearly depends on the choice of ratings provider, or the manner in which an investor develops its in-house ratings' methodology. Therefore, to better understand the usefulness of this metric to investors, the relationship between the E pillar and underlying categories and metrics need to be assessed.

Analysis suggests that a higher score on the overall environmental pillar does not always correlate to low environmental or carbon impact as measured at the level of individual metrics. The core metrics chosen to be analysed focus on the direct effect a company can have on the Environment. In this case the measures assessed are: CO2 Emissions, Total Waste Produced, Total Energy Used and Total Water Withdrawal.

Table 1. Measures of outputs that negatively affect the environment

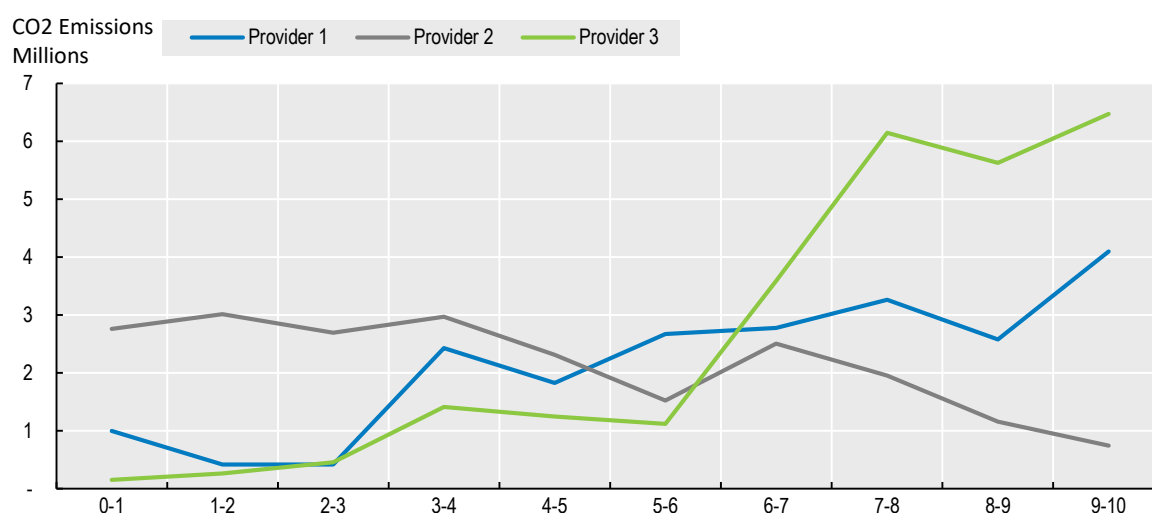
CO2 Emissions	Total Carbon dioxide (CO2) and CO2 equivalents emission in tonnes. Direct (scope1) + indirect (scope 2). Following gases are relevant: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCS), perfluorinated compound (PFCS), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3). (GHG) protocol followed for all emission classifications by type
Total Waste Produced	Total amount of waste produced in tonnes. Non-hazardous waste + hazardous waste. Only solid waste is taken into consideration except if liquid waste reported in 'ton' For sectors like mining, oil & gas, waste generation like tailings, waste rock, coal and fly ash, etc are also considered
Total Energy Used	Total direct and indirect energy consumption in gigajoules that has been purchased and consumed within the boundaries of the company's operations. For utilities, transmission/ grid loss as part of its business activities is considered as total energy consumed and data not to consider electricity produced to answer energy use (utility company produce to sell). Raw materials such as coal, gas or nuclear used in the production of energy are not considered under 'total energy use.
Total Water Withdrawal	Total water withdrawal in cubic meters from any water source that was either withdrawn directly by the reporting organisation or through intermediaries such as water utilities Different sources of water like well, town/utility/municipal water, river water, surface water, etc are considered

Source: Refinitiv

Materiality relating to environmental factors may differ by sector and industry, so the importance and use of metrics may also vary. However, particular metrics are nonetheless regarded as core metrics for every company to assess its impact on the Environment. The challenges investors face are related to how these submetrics are built, starting from the information each company reports to how rating providers aggregate these information. Submetrics relate to all the basic information that is categorised and then aggregated in the E, S and G pillars, such as data related to environmental impact and social rights reported in quantitative or qualitative way.

To determine the relationship between core outputs related to the environment, we analysed the correlation of total CO₂ and CO₂ equivalent emissions, which is a measure that is often taken into account when looking at environmental sustainability and the E pillar score. Results show a positive correlation with E Pillar scores for two providers. This means that higher ESG rated companies, on average, pollute more in terms of gross output of carbon dioxide. This does not hold true for one ESG provider, which shows the inverse trend. In this regard Section II will shed light on the drivers of these differences.

Figure 2. CO₂ emission by E pillar score for three providers, World, 2019

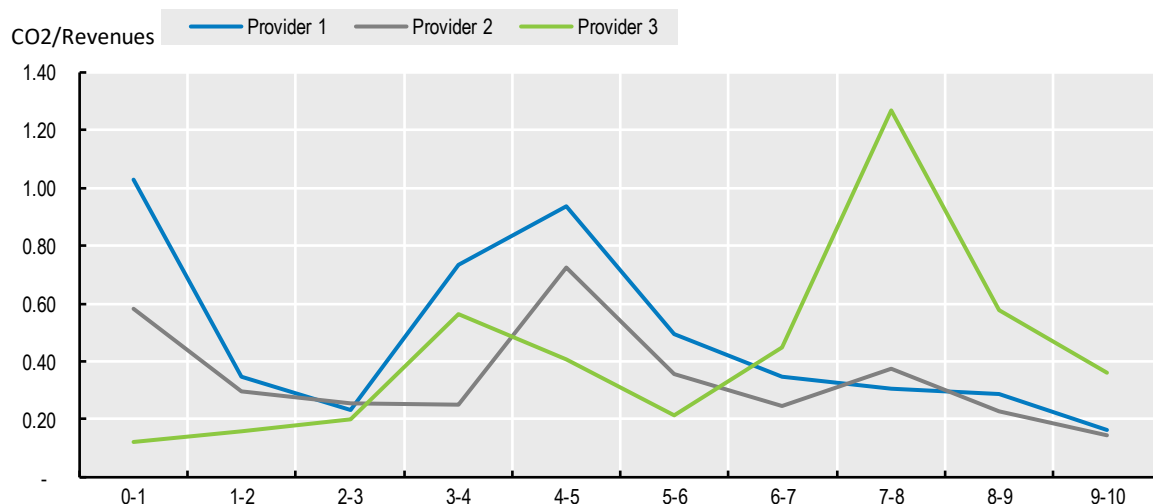


Note: Average tonnes of estimated CO₂ and CO₂ equivalent emissions (Scope 1 and Scope 2, as reported by Refinitiv's methodology for estimating emissions) by E pillar deciles for different providers.

Source: Bloomberg, MSCI, Refinitiv, OECD calculations

The results are compared to a measure of CO₂ Emissions/Revenues, to reduce the bias associating ESG ratings to the size of companies. This could lead to higher CO₂ Emissions attributed to companies with higher scores because these represent larger companies, even though companies generating high revenues from carbon fossils could have a low CO₂/Revenues ratio. The analysis shows that one of the providers still shows a positive correlation between E pillar score and CO₂ Emissions, while two of the providers show a decreasing relation.

Figure 3. CO2 emission/revenues by E pillar score for three providers, World, 2019

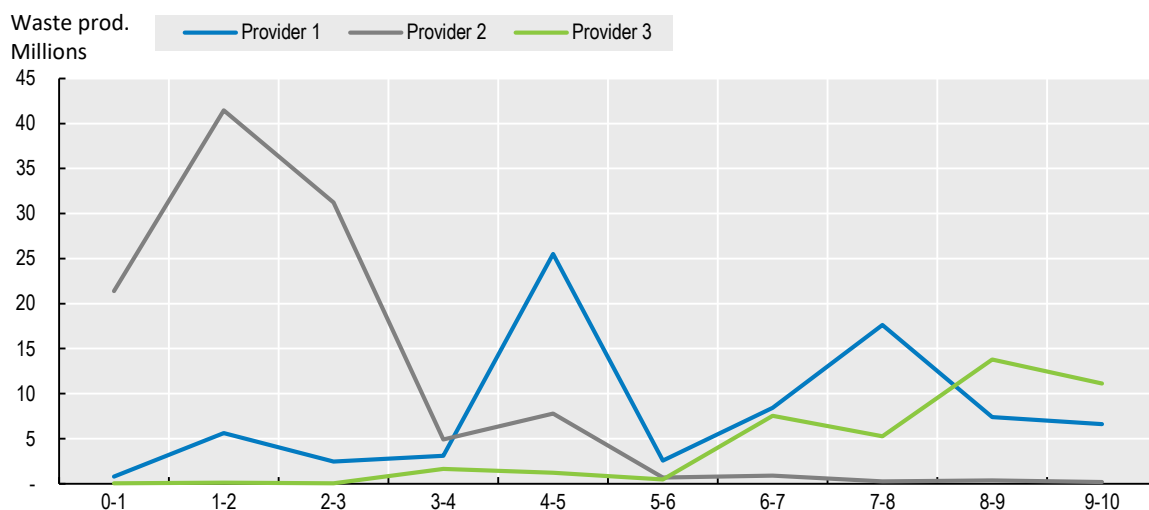


Note: Average tonnes of estimated CO2 emissions divided by Revenues, by E pillar deciles for different providers

Source: Bloomberg, MSCI, Refinitiv, OECD calculations

The indicator “Total Waste Produced” follows a similar pattern, showing that two providers out of three attribute companies with higher Waste Produced higher E pillar scores.

Figure 4. Total waste produced by E pillar score for three providers, World, 2019

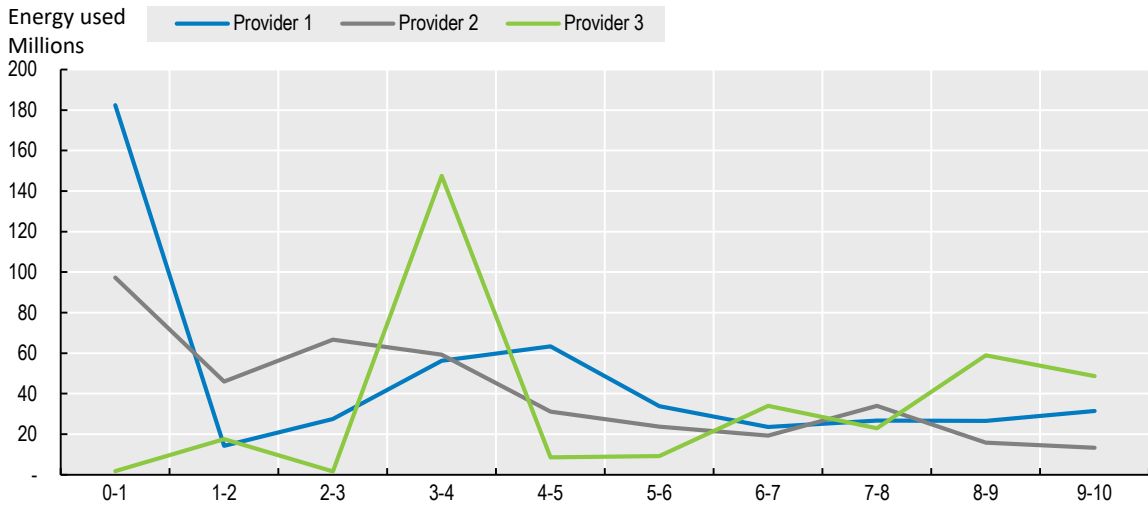


Note: Average tonnes of waste produced (hazardous and non-hazardous) by E pillar deciles for different providers.

Source: Bloomberg, MSCI Refinitiv, OECD calculations

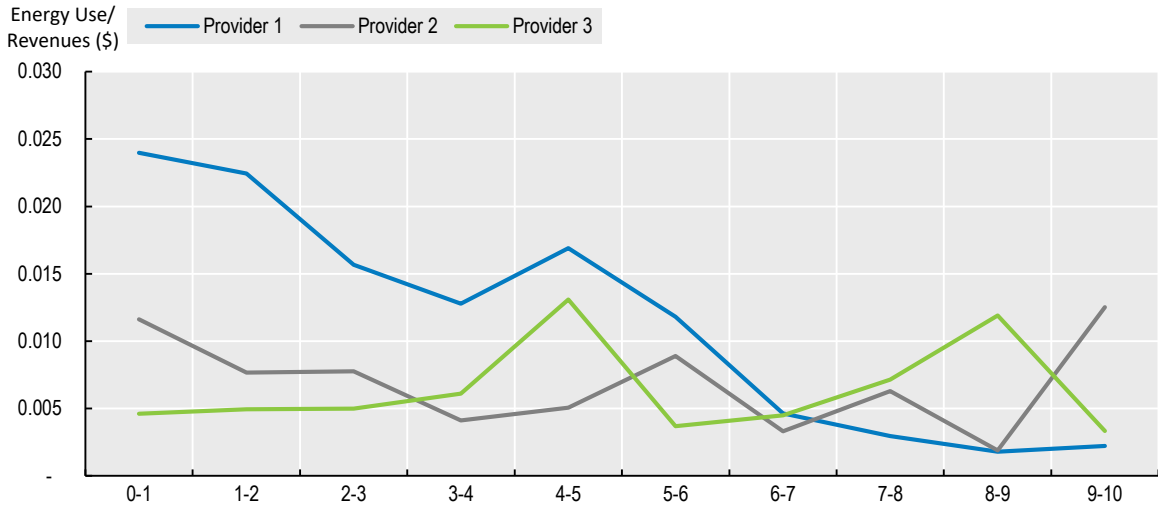
Regarding Total Energy used and Total Water withdrawal, a different pattern can be observed, with two providers showing decreasing energy use for higher E scores, but higher Water Withdrawal for all providers. This could be as water withdrawal might not have a direct impact on the environment to the extent that measures such as CO2 Emissions or Waste Produced have.

Figure 5. Total energy used in tonnes by E pillar score for three providers, World, 2019



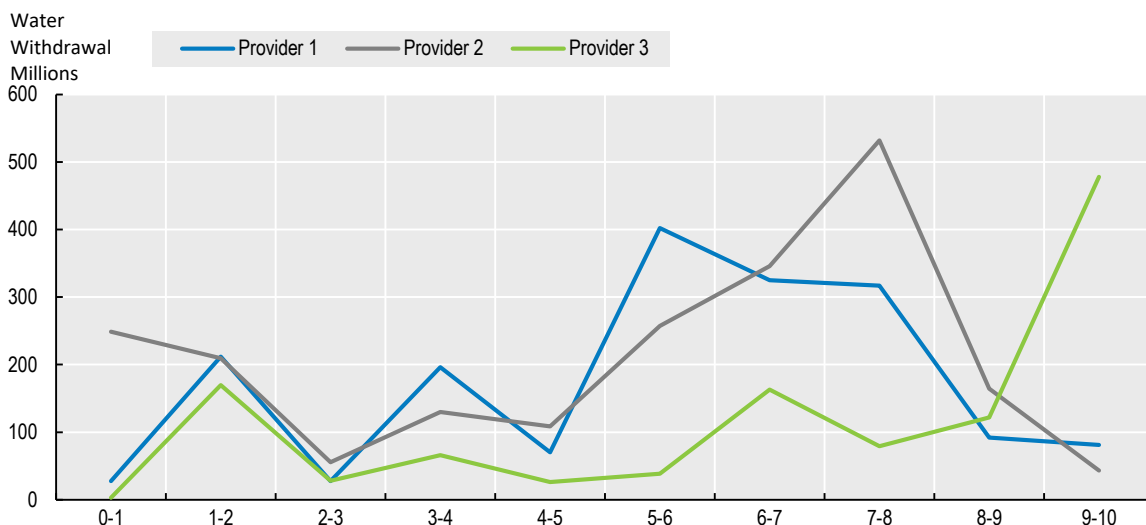
Note: Average Gigajoules of energy used after accounting for renewable energy by E pillar deciles for different providers
 Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Figure 6. Total energy used/ Revenues by E pillar score for three providers, World, 2019



Note: Average Gigajoules of energy used after accounting for renewable energy over revenues by E pillar deciles for different providers
 Source: Bloomberg, MSCI, Refinitiv, OECD calculations

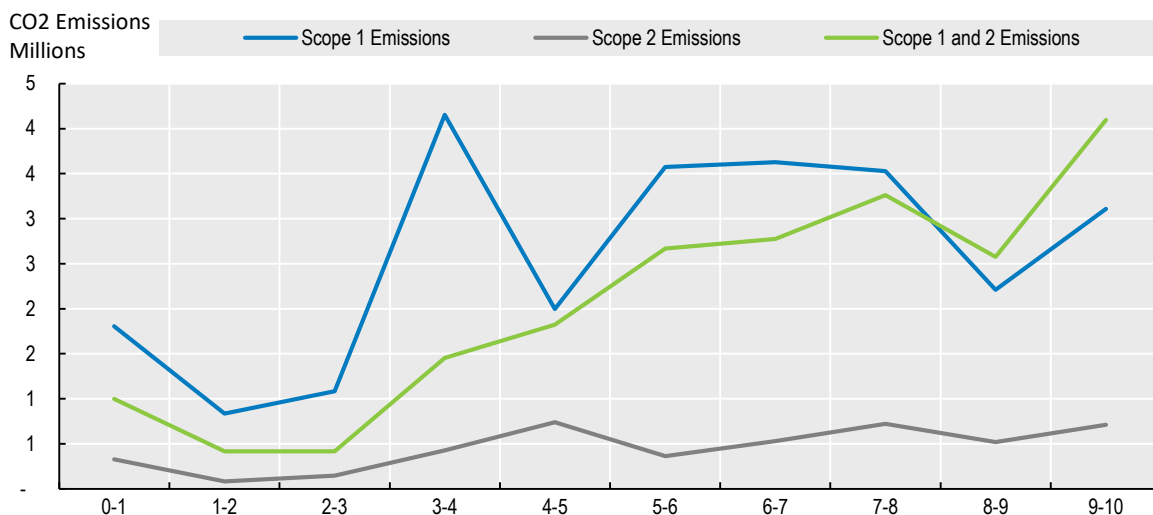
Figure 7. Total water withdrawal in tonnes by E pillar score for three providers, World, 2019.



Note: Average cubic meters of water withdrawal by E pillar deciles for different providers
 Source: Bloomberg, MSCI Refinitiv, OECD calculations

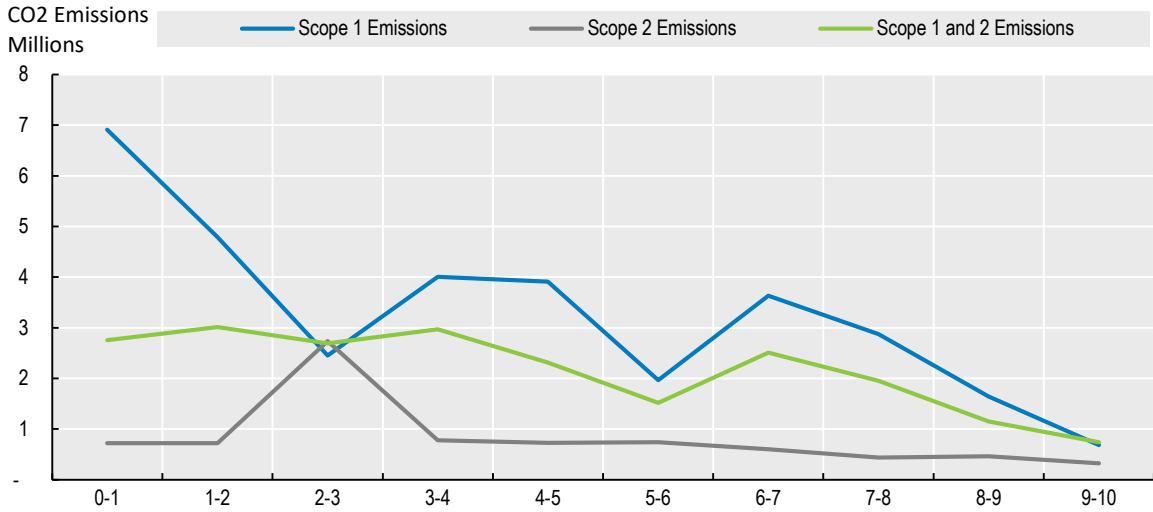
The analysis on CO2 Emissions was deepened in order to understand how the break down in Scope 1 and Scope 2 emissions changes by rating provider. The results confirm previous findings, showing that for two providers, both scope 1 and 2 emissions increase. Nonetheless for every provider Scope 1 emissions are higher than Scope 2 emissions. The data on Scope 1 and 2 Emissions in aggregate are richer as a result of the Refinitiv Estimation method.¹⁴ A comparison with the CO2/Revenues metric reveals that the ratio remains relatively stable in the different deciles, implying that, after taking into account for the size of the company using revenues, CO2 emission are not correlated to E pillar scores.

Figure 8. Carbon Emissions by Provider 1, World, 2019



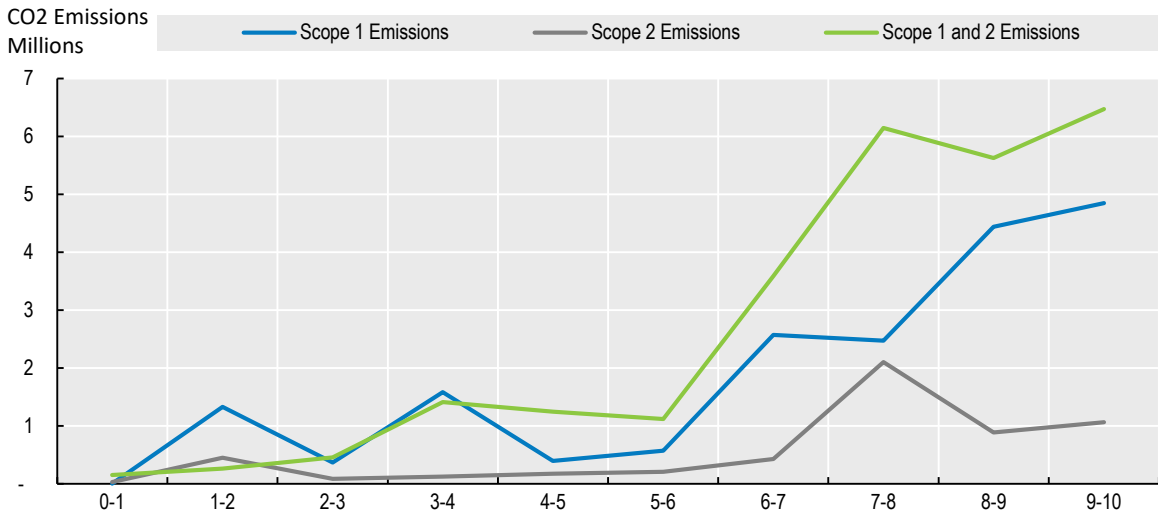
Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Figure 9. Carbon Emissions by Provider 2, World, 2019.



Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Figure 10. Carbon Emissions by Provider 3, World, 2019.



Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Further analysis aims to understand if different drivers, such as transition plans to renewable energy or fossil fuels divestment policies, are driving high E pillar ratings and how they are reflected in the final score. In this regard different metrics were selected to represent the policy adopted by different companies, in accordance to Refinitiv data.

The results show a positive correlation between transition policies adopted and the E pillar score for all three providers. This shows how long term policies are reflected into the E pillar ratings in contrast to measures of negative outputs such as carbon emissions. This implies that such policies prove to be the main driver of high E pillar scores.

The information provided by companies in this regard is not yet regulated enough to ensure a transparent and uniform methodology. The issue lays in the long term measurement of how these policies are implemented and if they are respected by the companies who put them in place.

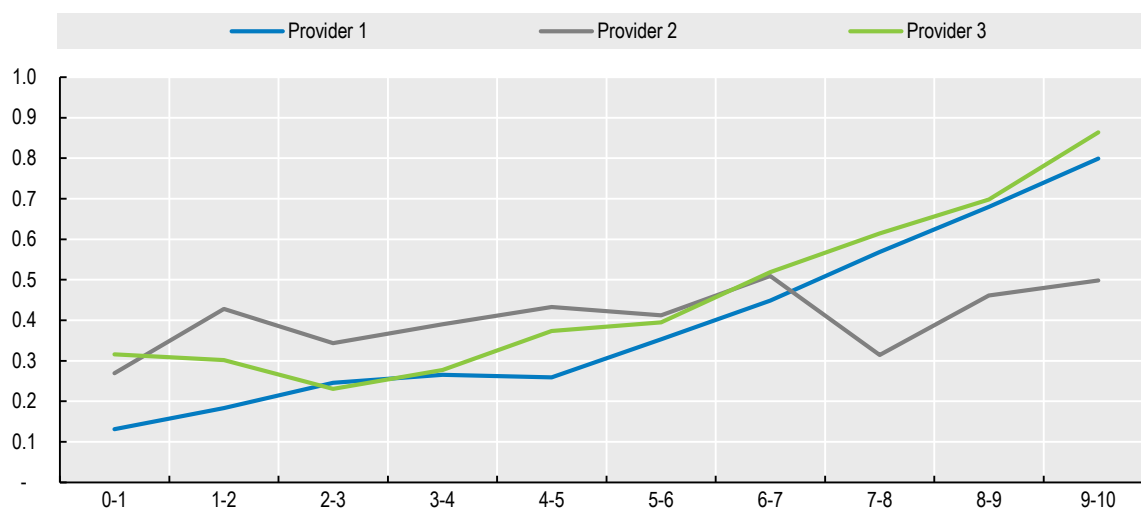
Table 2. Measures of policies implemented for climate transition

Climate Change Risks/Opportunities	Is the company aware that climate change can represent commercial risks and/or opportunities? - development of new products/services to overcome the threats of climate change to the existing business model of the company - some companies take climate change as a business opportunity and develop new products/services
Environmental Innovation Score	Environmental innovation category score reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
Emission Reduction Processes/ Policy Emissions Reduction	Does the company have a policy to improve emission reduction? - in scope are the various forms of emissions to land, air or water from the company's core activities - processes, mechanisms or programs in place as to what the company is doing to reduce emissions in its operations - system or a set of formal, documented processes for controlling emissions and driving continuous improvement

Note: The metrics range from 0 to 1, as some of them are binary options (Yes or No) and have been transformed numerically accordingly (Yes=1 and No=0). The Environmental Innovation Score is not binary. The data has then been averaged by E pillar percentile, in order to understand to which extent higher policy transition adoption correlates to higher E pillar ratings.

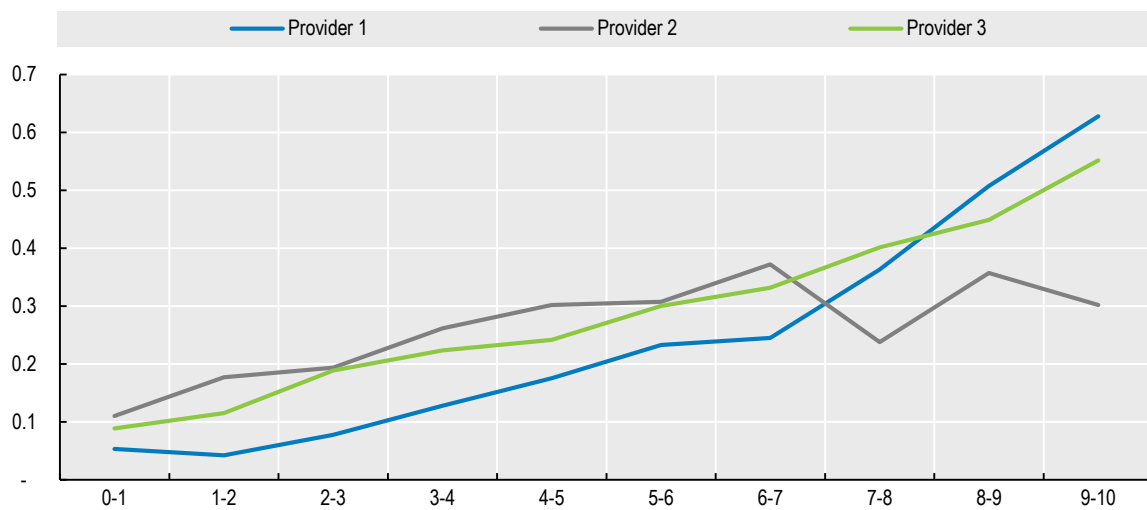
Source: Refinitiv

Figure 11. Climate Change Risks/Opportunities by E pillar score for three providers, World, 2019



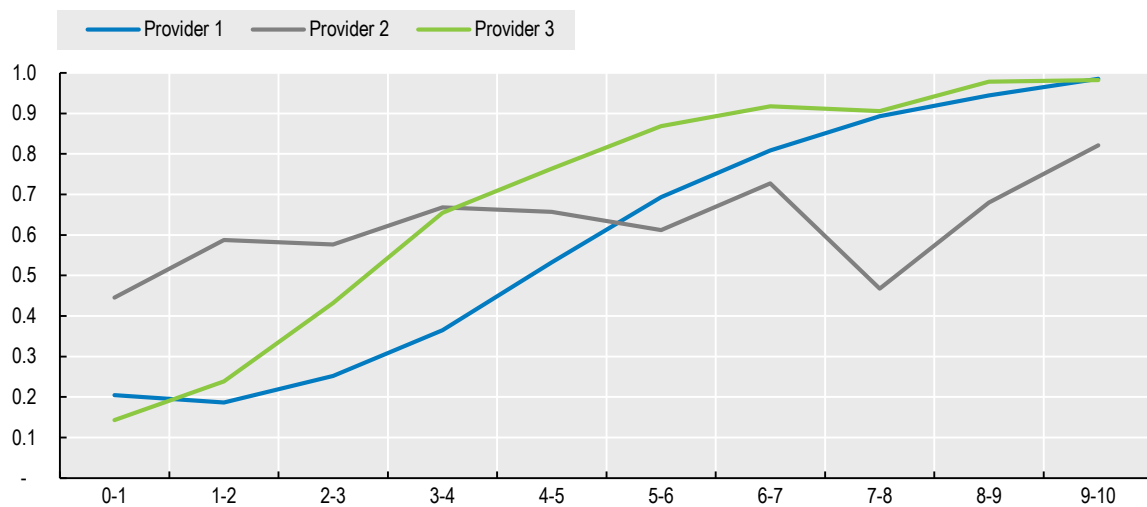
Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Figure 12. Environmental Innovation Score by E pillar score for three providers, World, 2019



Source: Bloomberg, MSCI, Refinitiv, OECD calculations

Figure 13. Emission Reduction Processes/Policy Emissions Reduction by E pillar score for three providers, World, 2019



Source: Bloomberg, MSCI, Refinitiv, OECD calculations

The analysis raises questions about the usefulness of the application of ESG scores and its metrics on the investment process in order to create portfolios aligned with low-carbon economies, given the low correlation of E pillar scores and low carbon emissions. Nonetheless, transition strategies are taken into account for the computation of the E pillar score, even though questions remain on the monitoring of the adoption of such policies, and there are no formal principles or standards such as those associated with green bonds¹⁵. The alignment will depend not only on the provider analysed but also on which metrics the investor decides to integrate. As such, there is potential for so-called green washing where by high E issuers are able to benefit from greater access to capital but do not face sufficient scrutiny over the manner in which they implement environmental sustainability strategies.

2. Analysis of sustainable indices and funds

Investor demand for market-based products that facilitate green finance, including instruments that help reduce portfolio exposure to carbon emissions, contributed to interest in ESG funds with high E scores among a range of green products.

This section seeks to understand how ESG funds and indices that are built to provide a more sustainable investing framework differ from the underlying market index resulting from the application of ESG strategies. In particular we look at how constituents and CO₂ emissions change when moving from a standard index or fund to an ESG index or fund and what alternatives are available to investors that want to shift to greener options.

Three of the largest indices and funds replicating indices have been selected, including S&P, MSCI and STOXX and their ESG counterparts. These indices are the S&P500 and the STOXX 600, and their ESG-counterparts indices. The funds selected represent the MSCI World and its ESG leaders and ESG screened counterparts. The analysis of the methodologies¹⁶ applied to screen the parent index reveals a stronger presence of exclusionary screening application¹⁷ which removes companies based on predefined criteria such as involvement in certain industries. Through this methodology indices remove said companies, without tilting or integrating ESG scores in different ways.

In this context, the presence of constituents in the most polluting industries are assessed¹⁸ of the parent benchmark and the analogous ESG counterparts, to understand how the application of these methodologies affects the sustainable indices and if the most polluting companies were removed or their presence limited due to portfolio rebalancing toward companies with higher ESG scores. When analysing the ESG indices, it is evident that for some providers the weight in the energy sector has increased and the constituents did not change. This holds true for S&P500 ESG and STOXX600 ESG indices.

When looking at the differences between the S&P500 and its ESG counterpart, we notice little differences in terms of largest holdings and industry representation. Moreover, we notice that the weight of some industries such as Energy has increased. This is due to the exclusionary screening application, which, by removing companies in some industries, increases the weight of industries that were less affected by companies' removal. This suggests that the exclusions were more likely to be due to unacceptably low standards with respect to governance or social standards. Thus, rebalancing of portfolios away from such companies may inadvertently shift investments toward high E rated firms that happen to be above average polluters.

Table 3. S&P500 and S&P500 ESG indices comparison, 2020

Industries/Index	S&P500	S&P 500 ESG	S&P500	S&P 500 ESG
# constituents	505	311	Largest companies by market cap.	
Basic Materials	2.40%	1.91%	Linde PLC Ecolab Inc Sherwin-Williams Co	Linde PLC Ecolab Inc Air Prod & Chem Inc
Energy	4.01%	4.23%	Exxon Mobil Corp Chevron Corp ConocoPhillips	Exxon Mobil Corp Chevron Corp ConocoPhillips
Industrials	9.71%	7.93%	Boeing Co United Tech. Corp Honeywell Internat. Inc	United Tech. Corp Union Pacific Corp United Parcel Ser Inc
Utilities	3.03%	3.06%	Nextera Energy Inc Duke Energy Corp Dominion Energy Inc	Nextera Energy Inc Duke Energy Corp Dominion Energy Inc

Note: The weights are based on the market capitalisation of the industry analysed over the total market capitalisation of the index
Source: Refinitiv, S&P, OECD calculations

The analysis on the STOXX 600 index and the STOXX 600 ESG-X index show that the ESG index does little to improve the environmental impact relative to the benchmark index. The applied methodology removes 20 companies in an index representing 600, with little differences in the final constituents. In the case of the Energy sector, Total, BP and Royal Dutch Shell are the largest companies for both STOXX 600 ESG and non-ESG indices.¹⁹ These companies, according to Refinitiv data, all have an Environmental Pillar scores at or above 90/100, while MSCI has scores ranging from 4 to 6.2/10, and for Bloomberg from 77 to 92/100.

Table 4. STOXX 600 and STOXX 600 ESG-X indices comparison, 2020

Industries/Index	STOXX 600	STOXX 600 ESG-X	STOXX 600	STOXX 600 ESG-X
# constituents	600	580	Largest companies by market cap.	
Basic Materials	7.19%	7.58%	Linde Air Liquide Rio Tinto	Linde Air Liquide Rio Tinto
Energy	5.06%	5.41%	Total BP Royal Dutch Shell	Total BP Royal Dutch Shell
Industrials	12.82%	11.38%	Airbus Siemens Schneider Electric	Siemens Schneider Electric Vinci
Utilities	5.30%	5.36%	Enel Iberdola National Grid	Enel Iberdola National Grid

Note: The weights are based on the market capitalisation of the industry analysed over the total market capitalisation of the index
Source: Refinitiv, Stoxx, OECD calculations

However, other approaches show a sharp contrast in selection of constituents. The analysis based on iShares MSCI ETF series shows differences between the traditional index and the ESG funds, in particular for the ESG Leaders Index, where constituents are completely different from the benchmark index. We notice that the iShares MSCI World fund constituents are fewer than the original index, which comprises around 1600 companies. The MSCI World ESG Leaders include securities of companies with the highest MSCI ESG ratings representing 50% of the market capitalisation in each sector and region of the parent Index.

Table 5. MSCI World and MSCI ESG funds comparison, 2020

Industries/Index	MSCI World	MSCI W ESG Screened	MSCI W ESG Leaders	MSCI World	MSCI W ESG Screened	MSCI W ESG Leaders
# constituents	1 207	1 540	847	Largest companies by market cap.		
Basic Materials	4.14%	3.79%	4.62%	Bhp Group Rio Tinto Linde	Linde Air Liquid BASF	Linde Air Liquid Air Prod&Chem
Energy	4.58%	4.22%	3.75%	Exxon Mobil Royal Dutch S Chevron	Exxon Mobil Chevron Total	Total ConocoPhillips Equinor
Industrials	11.74%	10.55%	12.04%	Boeing United Tech. Honeywell	Union Pacific 3M Siemens	Union Pacific Siemens United Parcel
Utilities	3.58%	1.87%	3.89%	Nextera En. Duke En. Enel	Nextera En. Iberdrola Exelon	Iberdrola Dominion Southern C.

Note: The weights are based on the market capitalisation of the industry analysed over the total market capitalisation of the index
Source: MSCI, Refinitiv, OECD calculations

The environmental impact analyses of the chosen ESG funds is assessed in order to understand how they reflect CO2 Emissions in aggregate, on average and after accounting for market capitalisation weighting, so as to have a clear view on how the methodology reduces the exposure to emissions. The aggregate analysis takes into account the sum of the amount of CO2 by company present in the index or fund, not being affected by the percentage in the portfolio while the tilting methodology analyses the market capitalisation of companies before and after the ESG application.

The CO2 emissions analysis performed on the S&P500 indices shows decreasing total emissions for the ESG index but, when averaging and tilting the emissions by sector, we can notice how, for some sectors, it is higher. This could be due to the fact that removed companies were not the highest polluters in the index relative to the average and that more companies were removed from other sectors so that the overall weight of the index in the analysed sectors increased.

Table 6. Estimated CO2 emissions comparison for S&P500 indices, 2020

Index	S&P500	S&P 500 ESG	S&P500	S&P 500 ESG	S&P500	S&P 500 ESG
Industries	Aggregate CO2 Emissions		Average CO2 Emissions		Weighted CO2 Emissions	
Basic Materials	19	133	7.8	9.5	0.234	0.269
Energy	391	314	14	22	1.9	2.6
Industrials	261	165	3.4	3.4	0.388	0.390
Utilities	879	588	31	30	1.2	1.1

Note: The data is in millions. The weighted methodology analyses CO2 emissions weighted by market capitalisation of companies before and after the ESG application

Source: Refinitiv, S&P, OECD calculations

The STOXX 600 ESG Emissions show very little difference from the parent index. This could happen because the methodology applied by STOXX removes only a total of 20 companies from the parent. In this case companies in the Energy sector were not removed at all. Even here results show generally higher average and weighted CO2 emissions.

Table 7. Estimated CO2 emissions comparison for STOXX 600 indices, 2020

Index	STOXX 600	STOXX 600 ESG-X	STOXX 600	STOXX 600 ESG-X	STOXX 600	STOXX 600 ESG-X
Industries	Aggregate CO2 Emissions (mln)		Average CO2 Emissions (mln)		Weighted CO2 Emissions (mln)	
Basic Materials	763	761	14	15	1.6	1.7
Energy	357	357	12	12	1.9	2.1
Industrials	209	204	1.9	2.1	0.217	0.213
Utilities	598	413	23	17	1.9	1.8

Note: The data is in millions. The weighted methodology analyses CO2 emissions weighted by market capitalisation of companies before and after the ESG application

Source: Refinitiv, Stoxx, OECD calculations

The emissions analysis performed on iShares fund based on MSCI indices provides different results. The ESG funds, in particular the ESG leaders²⁰, is able to reduce drastically the amount of CO2 Emissions both in the aggregate, averaging and weighted analysis.

Table 8. Estimated CO2 emissions comparison for MSCI World funds, 2020

Index	MSCI World	MSCI ESG Screened	MSCI ESG leaders	MSCI World	MSCI ESG Screened	MSCI ESG Leaders	MSCI World	MSCI ESG Screened	MSCI ESG Leaders
Industries	Aggregate CO2 Emissions (mln)			Average CO2 Emissions (mln)			Weighted CO2 Emissions (mln)		
Basic Materials	1 178	1 220	487	14	11	6.9	0.606	0.566	0.498
Energy	904	736	334	15	12	7.6	1.8	1.7	0.622
Industrials	433	619	233	2.3	2.4	1.6	281 772	272 991	0.311
Utilities	1 823	402	848	31	10	21	1.3	0.327	1.21

Note: The data is in millions. The weighted methodology analyses CO2 emissions weighted by market capitalisation of companies before and after the ESG application

Source: MSCI, Refinitiv, OECD calculations

These insights suggest that investors would need to conduct a considerable amount of analysis to determine if available ESG investment choices would align with their specific investment objectives related to environmental issues. As such, investors may find difficult and time consuming to extrapolate information on ESG indices and funds to the extent metrics and ratings vary, and submetrics that unlock more specific information may not be readily available.

The analysis is extended to analyse how the application of E scores by different providers to a market index such as the S&P500 influences the original weighted carbon emissions. The following table provide evidence that the tilting using high E pillar scores of two out of three providers associates with higher emissions.

Table 9. S&P 500 comparison

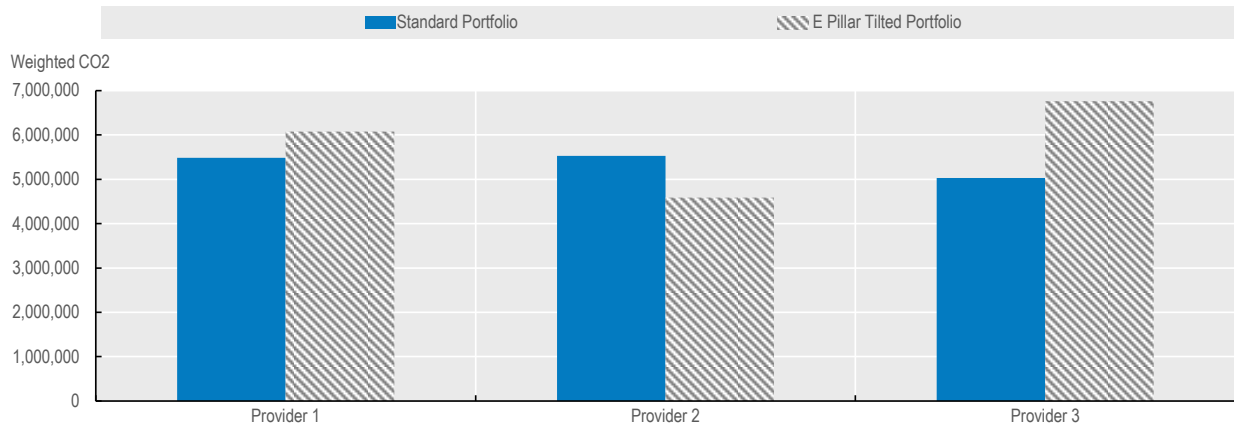
Weighted CO2 Emissions	Provider 1	Provider 2	Provider 3
Standard S&P 500	5 514 354		
E pillar tilted Portfolio	5 903 450	4 633 704	6 539 506

Note: The analysis is done using Refinitiv Estimated CO2 Emissions data. The weights are based on market capitalisation only for the standard index. For the E pillar tilted portfolio the stocks have been weighted by the E pillar score for the companies that had one (E pillar score* Market Capitalisation) and the result has been normalised at 100%.

Source: Bloomberg, MSCI Refinitiv, S&P, OECD calculations

A similar methodology was applied to a stylised portfolios built with companies with an E score from three providers. The standard portfolios is built without tilting, while the E pillar portfolio is tilted using the E pillar score.

Figure 14. E pillar portfolios comparison by different providers, 2020



Note: The portfolios have been built using companies with an E pillar score. The stocks in the E pillar tilted portfolio have been weighted by the E pillar score (E pillar score* Market Capitalisation) and the result has been normalised at 100%.

Source: Bloomberg, MSCI Refinitiv, OECD calculations

In light of growing demand, the finance industry is creating more products and services related to ESG ratings, indices, and funds. Investors seeking to position themselves for a transition to a low-carbon economy can now invest in green transition and renewables funds, which are now in the hundreds. Specialised climate funds have been created, such as the PIMCO Climate Bond fund, the Blackrock iShares Global Green Bond ETF (which tracks the Bloomberg Barclays MSCI Green Bond Index), or the Invesco WilderHill Clean Energy ETF. These funds focus on investing in green bonds as well as bonds from issuers showing innovative approaches to environmental sustainability. The bonds in which the investments are made are certified to be green by third parties or by the institutional investor itself, thereby assuring mechanisms for transition to low-carbon economies. For example PIMCO and iShares funds invest in bonds of companies and countries specifically issued to back green projects, while the Invesco fund invests in equities that are involved in renewable and clean energy.

Table 10. Comparison of climate funds' top five holdings

PIMCO Climate Bond Fund	iShares Global Green Bond ETF*	Invesco WilderHill Clean Energy ETF
BNP	France	Ballard Power Systems
ING	EIB	Plug Power
Central Japan Rail	KFW	Tesla
HSBC	Societe du Grand Paris	Enphase Energy
Danone	Netherlands	Ameresco

Note: For illustrative purpose only. * The iShares Global Green Bond ETF tracks the Bloomberg Barclays MSCI Green Bond Index

Source: Blackrock, Invesco, PIMCO, Refinitiv

The comparison illustrates available climate transition and green alternatives which focus directly on low carbon portfolios. As the portfolio composition would deviate more from the traditional indices, the returns and variance might differ from a standard portfolio, and therefore may not align with existing investment strategies of portfolio managers. However, for those that have flexibility of portfolio composition within their strategies and constraints, existing metrics and investment products would allow investors to construct portfolios that align with transitions to low-carbon economies. These types of investments might, for example, be benchmarked to indices that are explicitly aligned with improving environmental outcomes

which offers investors an objective and robust measure of market securities issued to fund projects with direct environmental benefits.

That said, use of climate-related benchmarks remain relatively limited, and recent studies suggest that climate and carbon focused benchmarks may suffer from similar challenges in terms of transparency, consistency and comparability. Assessment by the European Commission of such benchmarks found challenges similar to those outlined in this report. They include: (i) lack of harmonisation of the methodologies and lack of clarity on the objectives pursued with regard to the impact on global warming have affected comparability, reliability and adoption of low-carbon indices, (ii) varying degrees of reporting hinders investors' ability to compare indices and choose the adequate benchmarks for their environmental or climate-related investment strategy; (iii) many benchmarks offered in the market do not necessarily align with the financing needs associated with the 2-degree limit in accordance with the Paris Climate Agreement.²¹

In sum, ESG ratings provides benefits in unlocking a significant amount of information about corporate practices that may have an impact on the environment. Nevertheless investors should not draw conclusions too quickly that the E pillar is synonymous with corporate behaviours that are better for the environment. In this regard more work is needed to assess the consistency of metrics and their significance and how they are integrated along with other metrics related to climate risks and opportunities to derive the E pillar score. The following part of the paper will look more closely at the aforementioned metrics and aggregation.

3. Environmental pillar metrics used by rating providers

Transparent, consistent and comparable environmental, social and governance (ESG) data is critical for effective investment analysis and decision-making. In the context of the environmental pillar, it is equally important that investors have reliable information in order to prepare their portfolio for future risks that may arise from climate change and carbon transition, and to facilitate decisions that deliver risk-adjusted returns on investment. The analysis conducted in Section I suggests that when looking at the top performing companies by environmental pillar scores across leading ESG rating providers, outcomes at the metric level do not always represent low carbon emissions and positive impact on the environment. This raises the question as to whether the metrics included in the environmental pillar of ESG ratings are consistent with the material expectations of investors and follow a rationale expected for environmental issues. This is also a timely question as a number of reporting standards and frameworks have emerged that provide guidance to issuers and corporates on environmental reporting (see Section III.).

Already, findings suggest that not all top environmental pillar scores translate into low emissions or positive performance on environmental metrics. Analysis suggests that criteria other than carbon emissions tends to drive E score methodologies, and illustrates the divergence of environmental performance for various tranches of scores across prominent ESG rating providers. Building on this, Section II will explore the scope of metrics used by rating providers with respect to environmental factors and discuss differences in the measurement and scope across these providers. As such, it will explore to what extent differences in environmental pillar scores by rating providers are the result of variations in methodology, or from an underlying difference in the rationale of what constitutes good environmental performance, for example an emphasis on company management versus outright emissions and core environmental outcomes. Our initial findings suggest that it is a combination of both.

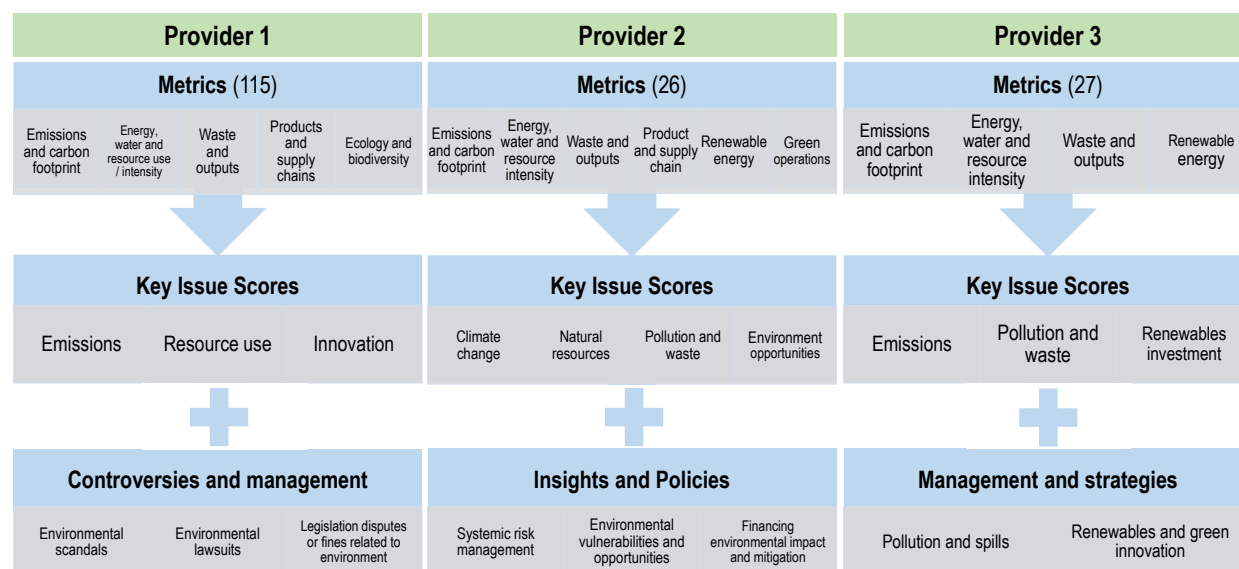
At the level of methodologies used for E scores, some clear differences emerge when assessing the broad categories and way in which the metrics are used. Some rating providers use the metrics to focus on emissions and environmental performance, while others also take into consideration aspects of systemic risk, energy management, as well as climate mitigation and transition opportunities. All three of the providers assessed (Bloomberg, MSCI and Thomson Reuters) collect and use environmental metrics that fit into the following broad categories:²²

- i. emissions and carbon footprint;
- ii. energy, resource and water use / intensity;
- iii. ecology and biodiversity;
- iv. waste management and output, and;
- v. renewable energy and climate mitigation.

These metrics are then used, along with binary indicators (based on supplementary information from company reporting or outreach) to calculate key issue scores for each of the rating providers. In addition to the key issue scores, all providers define two or three additional categories that use qualitative and

quantitative information to develop additional (and sometimes subjective) scores that will factor into the overall E score (see Figure 15.).

Figure 15. Environmental pillar approaches by rating providers



Note: Indicative categorisations based on available information
Source: Bloomberg, MSCI and Thomson Reuters, OECD analysis

The broad categories of metrics used by rating providers are homogenous, with consistency in the broad *types* of metrics collected. Despite a difference in the language used for key issue scores, the overall approach is also similar, with a focus on emissions and climate change, natural resource use, outputs and waste, combined with some form of forward looking category relating to a transition towards renewables or environmental opportunities. This said however, wide differences in the number and choice of quantitative metrics, as well as the way that the metrics are calculated and weighed, impact the scores. Similarly, additional analysis in the form of subjective or qualitative research by rating providers can also impact the overall rating. As the first part of this paper shows, the impact of different metric calculations and weights on the overall E score can be considerable.

Therefore, despite similarities in categories of metrics, the difference in the number of metrics used and measurement criteria contributes to inconsistencies. Preliminary research conducted in this section indicates that these differences may be a combination of the following:

- i. differences in the scope of metrics, namely those outside of the core;
- ii. difference in the measurement (i.e absolute vs. relative, or in some cases binary representing a score on disclosure) or input indicators to measure metrics, and;
- iii. difference in weight.

In addition, practices such as estimation in the case of missing data by providers may also further exacerbate the three.

The number of input metrics used by rating providers varies significantly; Provider 1 uses around 115, Provider 2 around 26 metrics, and Provider 3 uses a selection of around 27 metrics on environment (see Table 9, and Annex I for full list of metrics)²³. Provider 1 adopts an outright metric value measurement approach (for example, direct CO₂ equivalent emissions measured in either parts-per-million or units of micromol mol⁻¹), whereas Provider 2 adopts a binary approach for all metrics (for example, three-year

trend of average carbon emissions intensity measured by either -1, 0, or 1), which could include the calculation of several sub-metrics in order to decipher the overall metric score. Provider 3 uses both an outright approach and in some cases a binary approach to measure disclosure by companies on each metric. These metrics are then used to create scores across key issues, or rather environmental categories used by rating providers. This is complemented by additional analysis of company management strategies or insights (for example, in the case of Provider 2), which can have a notable impact on the rating. The logic for this is to also assess how well a company may be preparing to deal with environmental and carbon transitions risks and opportunities in future, yet the approach and methodology used for this portion of the rating can differ, and often relies on subjective judgement. In sum, these differences in methodologies are significant, and go some way to explaining how results of E scores differ widely despite similar names of high-level categories that comprise the E score.

Table 11. Environmental pillar metrics by category across rating providers

Number of publicly disclosed environmental metrics in each sub-category are noted, with the number of total environmental metrics for each provider in parentheses

Type	Category	Sub-category	Provider 3 (27)	Provider 2 (26)	Provider 1 (115)
Inputs	Product and supply chain	Materials sourcing and efficiency	-	2	5
		Supply chain management	-	1	6
	Renewable energy management	Use of renewables	1	1	4
		Investment in renewable energy	1	-	2
	Green operations	Green buildings	-	1	1
		Green products or operations	-	-	11
	Resource use	Total resource intensity	1	2	3
<i>Total in percent</i>			12%	27%	28%
Outputs	Emissions and carbon footprint	GHG / carbon emissions ²⁴	6	2	16
		Air quality	2	-	3
	Energy output and management	Energy output	3	-	8
		Energy management	2	1	4
	Water output and management	Water and wastewater outputs	3	-	7
		Water and wastewater management	2	2	4
	Waste and other outputs	Hazardous waste outputs and management	2	-	8
<i>Total in percent</i>			74%	19%	43%
Outcomes	Ecology and biodiversity	Ecological impact	2	2	2
		Biodiversity impact	-	-	6
	<i>Total in percent</i>			7%	8%
Processes	Risk management and policy	Climate impact and risk mitigation	-	3	1
		Environmental management systems	1	3	4
		GHG / carbon policy	-	-	4
		Environmental policy	-	3	5
		Environmental reporting	-	1	7
		Systemic risk management	-	2	1
	Sustainable finance	Sustainable finance	1	-	3
<i>Total in percent</i>			7%	46%	22%

Note: Number of metrics in each sub-category are noted, with the total number of environmental metrics in parentheses. Lack of publicly available information to a comparable level of detail between rating providers may hinder a full comparison, with potential variation from internal studies conducted by rating providers (for example, some only make composite indicators available with several proprietary metrics driving these, while others list outright measurement metrics). The aim of this table to present an indicative example of the scope of metrics within the E pillar. For a full list of metrics, please see Annex A.

Source: Bloomberg, MSCI and Thomson Reuters, OECD analysis

The rationale for the inclusion of certain metrics differs across rating providers. Provider 3 has a greater focus on metrics that measure company disclosure for emissions in the form of greenhouse gases, carbon emissions, particulate matter (air quality), and related waste outputs of the company through its operations. This can in some cases include relevant management aspects. Provider 1 and Provider 2²⁵ go beyond this to take into consideration initiatives, investments and management procedures that could have an impact on future emissions or exposure to carbon transition opportunities and risks. It is worthwhile to note here however that when disclosure and management aspects are taken into consideration, these constitute a small minority of metrics. In addition to this Provider 2 adopts an approach in which sub-metrics²⁶ are used to provide a binary value for all metrics which can include both current emissions and environment relevant operations, but also initiatives and forward looking strategies. This difference in approaches may account for the relative correlation with environmental indicators for some but not all of the rating providers as outlined in Section I.

The rating methodologies assessed combine emissions and output metrics with management and policy in order to assess risk. Within the risk management and policy category, all rating providers have at least one metric that assesses the management aspect of the environmental pillar (but never more than seven). For Provider 3 this includes environmental management of pollution and spills as well as a forward looking assessment of renewables and energy innovation. Provider 2's metrics take into consideration management aspects in a number of the binary metrics used across all categories. In addition to this they have complementary insights on policies and systemic risk management of companies that includes environmental risk and opportunities as well as financing of climate change impact and mitigation. Provider 1 assesses controversies and management practices of the company in addition to metrics for the key issues scores. These are binary indicators that include environmental scandals, lawsuits and fines incurred by the company within a certain period of time.

To arrive at an overall E score, all ratings providers use weighted averages of the key issue categories (refer back to Figure 15.), that may be normalised by a company's industry. This may also account for differences between E scores of ESG rating providers. The weighting of metrics through key issue categories (which can also include binary metrics on supplementary information such as risk management practices) defines the importance of some environmental areas versus others, which are equally important for the overall ratings and the spectrum of metrics in general. Exact weightings are proprietary, however all three rating providers give general information on the system used for weightings. Key issue categories typically provide the basis for the weightings, and comprise of around 5% to 30% of the total E score. Provider 2 for example states that weightings take into account both the contribution to the industry, relative to all other industries, to the negative or positive impact on the environment or society; and the timeline within which [they] expect that risk or opportunity for companies in the industry to materialise.

Box 1. Understanding differences in the measurement of environmental metrics

Measuring emissions metrics

Metrics based on the GHG emissions of companies can include the measurement of carbon footprint, financed emissions and energy efficiency-related GHG emissions reductions indicators. Within GHG emissions, not all ratings cover the breadth of emissions, i.e. carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and fluorinated gases (hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulphur hexafluoride (SF₆) and natrium trifluoride (NF₃). In addition to this, metrics can either be expressed in absolute unit or relative unit values. Focusing only on CO₂ emissions for example, metrics across rating providers (Thomson Reuters, MSCI and Bloomberg) include either one or a number of the following: per unit of revenue, per employee, per unit of production volume (i.e. tons of steel), yet this is often static measurements, with only one provider including metrics that measure emissions intensity over time periods.

Measuring low carbon transition risk exposure and strategies

Of the rating providers with available information on the measurement of metrics on transition risk exposure (Provider 1 and Provider 2), this appears to include a combination of 1) a score that assesses exposure of products and services (outright demand change and substitution requirements) and operations (cost of abiding to regulations, capex and supplier costs) which should be a USD figure, and 2) an assessment of risk management efforts, including binary values based on governance structure, if targets exist and number of related controversies. These two components require both a unit value (typically cost expressed in USD), but also a commonly self-reported or independently assessed binary indicator that does not account for the quality of management strategies, thus it is not unexpected that two rating providers could report two different scores for the same company.

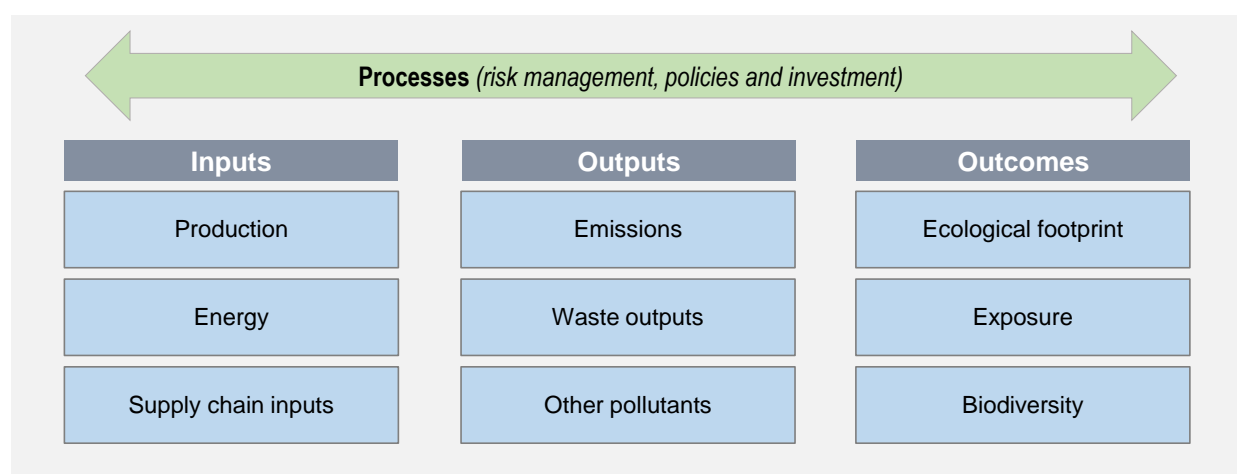
Note: Summary based on publicly available information and complementary analysis.

Source: Bloomberg, MSCI and Thomson Reuters, OECD research

In light of the comprehensive nature of the ESG agenda, the types of environmental metrics included in each of the E score frameworks can vary, with a multitude of possible measurement methodologies as well as underlying rationales for the inclusion of metrics. To illustrate this, metrics can be grouped as falling somewhere along the *input-output-outcome-process chain* (see Figure 16.) Production-related metrics such as those measuring energy consumption or water withdrawals tend to be inputs. Emissions metrics, including CO₂ and GHG emissions by source, regardless of whether they are expressed in unit value or as a share of revenue tend to represent outputs. Outcome focused metrics can include those that look at impact such as ecological and biodiversity. Process metrics can include binary metrics or descriptions of policies and risk management practices as discussed above; including for example, information on board oversight related to climate risk and transition to renewables.

The logic used in this chain can also be applied to frameworks such as those set out by the Task Force on Climate-related Financial Disclosures (TCFD) which recognises the importance of: (a) metrics on climate-related risks associated with water, energy, land use, and waste management (inputs and outputs); (b) greenhouse gas emissions using the scope 1 (direct emissions), 2 (indirect emissions from direct production), and 3 (indirect emissions from activities along the value chain) definitions (outputs and outcomes), and; (c) company management processes anticipated regulatory requirements or market constraints or other goals (TCFD, 2017).

Figure 16. Types of environmental metrics used by ESG rating providers



Source: OECD staff illustration

In addition to the difference in metrics and their associated measurement, the source and type of underlying data used differs among providers. Provider 3 collects public ESG information disclosed by companies through their sustainability reports, annual reports and websites. In some cases, Provider 3 also integrates metrics from third party ratings agencies, such as Sustainalytics, ISS quality score, and Carbon Disclosure Project (CDP) score. Provider 1 also collects reported data from the public domain, including company sustainability reports, annual reports and third party providers. Provider 2 uses a multitude of sources, including company disclosure, third-party databases, as well as direct co-operation with companies to develop qualitative and binary metrics.

The difference in the scope of metrics, related measurement of input data, and difference in weighting used by rating providers (Bloomberg, MSCI and Thomson Reuters), can account for differences in E scores and similarly the lack of correlation between the scope 1 and 2 emissions metrics (refer back to Figure 8, 9 and 10) and tranches of E scores. Similarly not all metrics align well with financial materiality, which may be more commonly found in the process group of metrics, nor with environmental and carbon footprint (i.e. output and outcome groups of metrics), nor with the longer-term transition to renewables.

The quality of E scores also rely on rating providers' ability to fill the data gaps disclosed by issuers by means of estimation models. Providers methodologies integrate a number of assumptions, both for transition and physical risk. Therefore it is important to understand to what extent E score assessments are based on actual or estimated data. In addition, the weight of forward-looking content should be transparent and clearly outlined. In the event that rating providers also offer a climate-related scenario assessment, in order to enhance the forward-looking nature of the score, an understanding of the way in which this is integrated into the E score methodology is vital.

Beyond this issues discussed within this section give rise to a number of challenges that may limit the use of ESG ratings, and related environmental scores, as market benchmarks for investment purposes:

Limited comparability: While diversity of analytical approaches may be welcome, the current state of approaches has resulted in the limited comparability of E scores across major providers.

Lack of transparency: There is rarely full disclosure of methodology, criteria, or threshold values and levels, with much of the information being labelled as proprietary. In addition to this, there is factor bias, for example, it is difficult to find information regarding weighting of various categories or underlying sub-metrics.

Selection bias: Larger companies have the resources to implement and communicate E pillar related strategies from renewable energy programmes, internal carbon pricing and risk management. Limited reporting on these strategies within smaller companies may impact overall E scores (OECD, 2019).

Limited scope within metrics: The use of binary indicators can limit the value of metrics to measure environmental performance or carbon emissions. In addition, these can be misleading, for example, in the measurement of a company's ability to deal with environmental scandals, rating providers may assess more favourably a company that has weathered a number of scandals compared to those that have had no scandals.

Subjectivity: The use of qualitative, subjective questionnaires or interviews with companies, as well as research conducted in collaboration with rating providers have a significant impact on E scores and in some cases call into question the credibility of assessments that are highly judgement-based to contribute to the E score process. The proprietary nature of ESG rating methodologies can also contribute to this.

4. Consideration of a core set of environmental pillar metrics

Comparable data on a company's environmental, social and governance (ESG) performance and practices is critical for effective assessment of ESG considerations. This data also plays an important role in the development of metrics used by ESG ratings providers. All three rating providers assessed in Section II of this note (Bloomberg, MSCI, Thomson Reuters) in part rely on company disclosure and reporting to develop their environmental scores and ESG ratings. Gaps in comparable data are significant and the burden on companies in selecting, interpreting and monitoring their performance against a given ESG framework has a knock on effect on ratings and available information to investors. Section III will outline the related reporting frameworks that are driving corporate disclosure on environmental pillar issues to assess to what extent these can help shift capital towards companies that contribute to the climate risk mitigation and low carbon transition.

Since 2002, a number of reporting frameworks and standards for ESG related corporate disclosure related to environmental issues have emerged (see Table 10.). The Carbon Disclosure Project released annual disclosure questionnaires with a focus on climate change, forests and water security. The Global Reporting Initiative has released several iterations of guidelines with relevant metrics to measure environmental impact for multiple sectors. The Sustainability Accounting Standards Board (SASB) identifies standards that are likely to constitute material information targeted to specific sectors. The International Integrated Reporting Council (IIRC) draws on a number of standards to identify areas for integrated accounting of non-financial information relating to the environmental and governance activities. The FSB's Task Force Climate-related Financial Disclosures (TCFD) provides company reporting guidelines on climate, energy, waste and water management. Additionally, the Climate Disclosure Standards Board's (CDSB) guidelines focus on the management of environmental policies, strategy and targets, including risks and opportunities in line with the TCFD framework.

Stock exchanges are also increasingly involved in providing guidance on environmental reporting for companies. The World Federation of Exchanges²⁷ released guidance on ESG reporting in 2018. Since then, a number of other exchanges have provided guidance to listed issuers. In 2019, Nasdaq released its second ESG reporting guide for listed companies across 30 categories, with 55 corresponding metrics, including 17 within the environmental pillar, which provides a clear benchmark and reporting prioritisation for companies.

Table 12. Corporate reporting frameworks with environmental guidelines

	Year	Purpose	Scope
Carbon Disclosure Project	2002	Releases annual disclosure guidelines on emissions, climate hazards and mitigation, water and governance	CDP provide questionnaires for company disclosure across climate change, forests and water security that cover emissions, carbon pricing, and governance
Global Reporting Initiative	2006	Global standards for companies to report on economic, environmental and social impact	The G4 sustainability reporting guidelines provide 34 metrics to measure environmental impact across a range of sectors
Sustainability Accounting Standards Board	2011	Provides basic concepts, principles, definitions, and objectives to guide sustainability accounting	Sector specific guidelines with between 10 and 29 environmental metrics per sector, and a median of five disclosure topics
International Integrated Reporting Council	2012	Framework to identify areas for disclosure and reporting relating to the environmental and governance activities of companies with the aim to maintain value creation over time	Outlines the context for environmental performance data and clarifies how value relevant information fits into operations or a business, and may help make company decisions more long-term
Task Force Climate-related Financial Disclosures	2015	Provides company financial reporting guidelines on climate, energy, waste and water management	TCFD make recommendations on targets and metrics that cover 28 key issues, with complementary guidance on management and processes
Climate Disclosure Standards Board	2015	Provide material information for investors and financial markets through the integration of climate change-related information into mainstream financial reporting	Provides non-sector specific guidelines across 12 categories for companies to report on environmental and climate change matters, including environmental policies, strategies and targets including guidelines for the assessment of impact
Nasdaq ESG Reporting Guide	2019	Provide guidance to listed companies on environmental reporting, and promote dialogue between investors and companies of the performance signal of better data on the topic	Outlines 17 metrics across 10 categories to assess environmental and climate related performance. Guidance is also given on measurement methodology of each metric

Source: OECD views based on publicly available information. The Nasdaq Guide provides an example of progress made by stock exchanges around the world.

All company reporting frameworks focus on how companies can integrate environmental issues and climate risks into their financial and non-financial reporting and disclosure. This said, however, the underlying rationale for each framework can differ. The Carbon Disclosure Project aims to improve corporate disclosure on the environmental impact of their operations in order to curb environmental degradation and climate related impacts. SASB takes a different approach, focusing on what might be material and financially relevant for each sector in order to maintain risk-adjusted returns for companies, and to provide greater information in line with this to the market. Similarly, the TCFD recommendations aim to help companies produce consistent, comparable, clear and reliable corporate disclosures on climate-related information to support informed decision-making and capital allocation by investors, lenders and insurance underwriters. In doing this, TCFD also focuses on how companies can improve risk management oversight as well and environmental strategies and overall governance of climate-related factors. The rationale for each framework has an impact on the focus and approach given to how environmental issues are more or less financially material for companies (see Box 2.), with references made throughout publicly available literature.

Box 2. References to materiality in line with environmental reporting

Materiality as a concept¹ defines why and how certain issues are relevant for a company or a business sector, this can refer to issues that are financially material (i.e. the approach taken by SASB) or issues that are material from the perspective of a range of stakeholders (i.e. the approach of GRI), for example by representing a material risk or importance for the business model of a company. Materiality applies in a wide variety of contexts, including on accounting, reporting, business model, financial, legal, risk and more recently, environmental, social, and governance issues. In this context, there appears to be two major perspectives on materiality. The first is with respect to financial materiality, centering on the impact the environment and climate change – both physical and transition risks – could have on a company. This provides a basis for financial materiality in the context of risk-adjusted returns for a company. The other is a stakeholder-oriented concept of materiality, which emphasises the impact a company has on the wider environment and society.

While not every metric fits neatly into one definition or the other, in a general sense the financial materiality is better captured by how firms assess climate risks, and take actions to mitigate those risks, or reduce exposure to inputs that could become scarce due to climate change. Stakeholder materiality relates more to the externalities of the business activities, including externalities from carbon and other emissions, and forms of waste. The category related to opportunities, such as with green transition to renewables (inputs and outputs) could affect both financial and stakeholder materiality.

Global Reporting Initiative

For purposes of reporting, the Global Reporting Initiative (GRI) suggests the report should cover aspects that reflect the organisation's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders. In the GRI G4 guidelines, materiality is defined as topics that have a direct or indirect impact on an organisation's ability to create, preserve or erode environmental value for itself, its stakeholders and society at large. (see GRI G4 Guidelines).

Sustainability Accounting Standards Board

The Sustainability Accounting Standards Board (SASB) uses the US Supreme Court definition of materiality: Information is material if there is “a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of information made available.” This perspective is more aligned with the rationale of financial materiality, despite the framework including metrics that may be both financial material and not material.

Task Force Climate-related Financial Disclosures

The financial impacts of climate-related issues on companies are not always clear or direct, and, for many companies, identifying the issues, assessing potential impacts, and ensuring that material issues are reflected in financial filings may be challenging. Better disclosure of the financial impacts of climate-related risks and opportunities on a company is a key goal of the Task Force. TCFD state that once a company assesses its climate-related issues and determines its response to those issues, it can then consider actual and potential financial (material) impacts on revenues, expenditures, assets and liabilities, and capital and financing. In addition TCFD recommends that the disclosure of strategies, targets and metrics be subject to a materiality assessment.

Nasdaq

While the concepts of “materiality” and “material business impact” are essential to a proper evaluation of ESG related factors cause and effect, Nasdaq states that it is not its intention to create a framework whereby materiality is evaluated – and that this work must be undertaken by the corporate reporters—possibly in concert with more detailed guidance from their listing exchange—and with the interests of their stakeholders at heart. When evaluating materiality, companies are encouraged to consider

impacts to external stakeholders and ecosystems in addition to those directly affecting the company. Nasdaq notes that direct reporting of ESG performance data provides just one part of a company's overall value proposition and long-term risk profile.

United States

The Securities and Exchange Commission (SEC) rule 405 states that "when used to qualify a requirement for the furnishing of information as to any subject," materiality "limits the information required to those matters to which there is a substantial likelihood that a reasonable investor would attach importance in determining whether to purchase the security registered."

United Kingdom

In accordance with UK 'Auditing Standards', information is considered to be material if its misstatement or omission individually or in aggregate could influence the economic decisions of users on the basis of the financial information provided.

European Union Non-financial Reporting Directive

The non-financial reporting directive (NFRD) outlines rules on disclosure of non-financial and diversity information by large companies. This directive amends the accounting directive 2013/34/EU. Companies are required to include non-financial statements in their annual reports from 2018 onwards. This includes a reference to double materiality which notes that environmental and social materiality should be considered in terms of impact on society and the environment, as well as financial materiality.

¹ The concept of materiality dates back to English Common Law in 1867, when the English Court introduced the term 'material', by referring to 'relevant, not negligible fact' that emerged in the judgement of the false accounting case concerning the Central Railways of Venezuela. Source: GRI, SASB, SEC, TCFD, UK Financial Reporting Council, European Commission and Nasdaq.

Constrained by available and interpretable information on the full landscape of emerging frameworks, this section will focus on GRI, SASB, TCFD, as well as Nasdaq. Frameworks typically include between 17 to 34 metrics within the environmental pillar. All include metrics on GHG emissions in line with the scope 1 (direct emissions), 2 (indirect emissions from direct production), and 3 (indirect emissions from activities of the company) definitions. These are either recommended in terms of the absolute unit value or relative to revenue, turnover or other measures, with not all frameworks prescribing the same method.

Company and issuer reporting will naturally have a wider scope than metrics used by ratings providers and will be likely to go beyond a snapshot of companies' current performance for the benefit of a wider pool of potential investors and shareholders, with the aim to provide an understanding of the fundamentals of environmental performance within the company. To this end, the corporate reporting frameworks assessed go beyond metrics and targets to also provide guidance on how companies can develop risk management processes, environmental strategies, and related governance aspects going forward (see Figure 17.). This guidance typically takes the form of reports, with some frameworks using workshops or outreach with companies to help support the development of company processes to improve environmental performance and climate risk management going forward.

Figure 17. Areas addressed across corporate reporting frameworks



Source: OECD illustration, adapted from TCFD.

The metrics used in the frameworks span across a shareholder-stakeholder perspective of materiality (see Box 2.), and can be broadly organised into at least three categories. The first category of metrics measures the potential (climate risk management; opportunities) or actual impact (inputs; outputs; outcomes) of climate-related risk on the performance, development and position of the company. The latter refers to the external impacts of a company's activities (outputs: scope 3; outcomes). The third relates to opportunities, such as to shifting operations and products to renewables. Similarly to metrics included in the methodology of rating providers, metrics in these frameworks sit across the input-output-outcome- process chain.

Going beyond the metrics used by rating providers, corporate reporting frameworks can also include metrics that cover the vulnerability to depletion or misuse of capital for production or business operations; exposure to new or existing regulation or changing societal norms, and; scenario-planning regarding alternative resources or business models. These go to the centre of the forward looking nature of climate risk and carbon transition, and may well include aspects that are not material to a company today but may be in future. Inclusion of, and guidance for the measurement / reporting of these metrics however differ widely across reporting frameworks with a high burden on the company to provide self-analysis.

Some frameworks, for example TCFD, provide a greater focus on the revenues, expenditures, assets / liabilities, and capital financing aspects of the environmental pillar, in particular in line with the extent to which financial and non-financial companies may be affected. This requires relatively standardised disclosure combined with supplementary information on strategies and processes. The TCFD recommendations take this approach stating that "climate scenarios [have presented the] critical economic imperative that cannot be ignored. 'Going green' is not just a matter of 'saving the planet'; it is about pursuing economic growth and development that is strategic, resilient, and sustainable." In addition to this TCFD recognise that providing standardised disclosure on climate-related information to support "a coordinated global transition to a low-carbon and climate-resilient economy is projected to involve significant financial opportunities." (TCFD, 2017) For example, some reports suggest that a decisive shift could yield economic gains of USD 26 trillion over the next 12 years compared to a 'business-as-usual' scenario. (ODI, 2018).

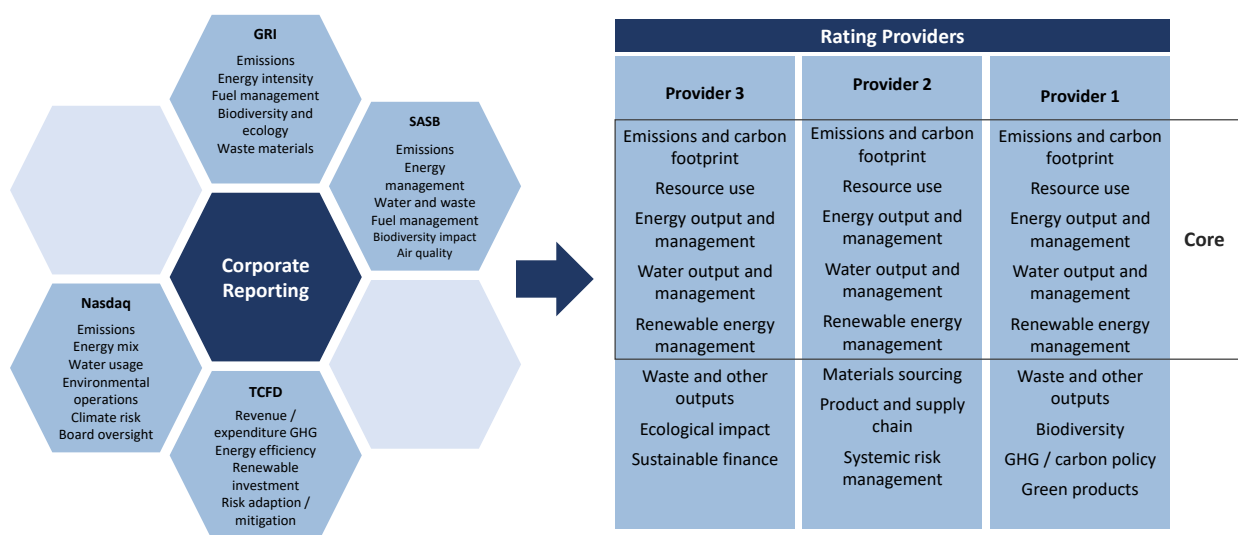
Other frameworks include a greater number of metrics that allows for more comparability to shape a ratings assessment. SASB has a similar underlying rationale, but yet a greater focus on a smaller number of targeted quantitative metrics for specific sectors. According to the SASB's most recent survey on disclosure (2017), noted that information was not provided in a standard format. Most companies release this information in a variety of pamphlets and other communications, including the glossy corporate social

responsible reports. Evidence suggests that this is common across at least three or the four frameworks assessed (with the exception of Nasdaq). Nasdaq focuses on a targeted set of 17 metrics that address 10 environmental and climate-related topics. Guidance for listed companies is standardised with the name of the metric and corresponding measurement methodology to ensure standardisation across companies. The benefit of this is that companies can more easily disclose information to allow investors in public markets to compare environmental metrics across companies, and allocate capital accordingly. The downside of this however is that the focus is on performance today as opposed to management practices and processes to improve performance in the medium and long-term.

The issue at hand is two-fold. First, investors and markets need accurate and comparable information on companies' environmental and climate-related performance and activities in order to assess to what extent this fits with investment strategies they have in place today. Second, and perhaps more difficult, investors and markets also need information on how companies are assessing and responding to risks posed to their operations in the medium and long-term as a result of carbon transition. The reporting frameworks assessed in this note attempt to take this into consideration, hence the mix of metrics and targets as well as complementary information on how to disclose management processes and strategies. All these aspects however are difficult to transfer into a format that can be disclosed in a standard format.

In light of the present and future requirements for carbon transition, corporate reporting frameworks address a broad set of issues, taking into consideration both environmental performance today but also forward looking transition processes. ESG rating providers, in contrast, focus more on standardised categories and associated metrics that are reported and comparable today. From this, corporate reporting frameworks feed into the metrics used in E score methodologies (see Figure 18.) with emissions metrics for example across all three rating providers using the scope 1, 2 and 3 definitions outlined in the TCFD recommendations. Categories and guidance from other corporate reporting frameworks such as SASB, GRI and Nasdaq also feed into metrics used for the E score, with a core emerging around the main metric categories.

Figure 18. Corporate reporting frameworks adopt mandates that can include different priorities, with a core set of metric categories being used by rating providers



Note: Summary based on publicly available information and complementary analysis
 Source: Bloomberg, MSCI, Thomson Reuters GRI, SASB, TCFD, and Nasdaq. OECD analysis

The metrics used by rating providers currently include a core set of categories, including on: emissions and carbon footprint; resource use; energy output and management; water output and management; and

renewable energy management. Despite commonalities on five categories of metrics, the underlying metrics used, methodology for measurement, and weight used differ materially across ESG rating providers.

The sub-categories that are used to measure metrics may also differ. Emissions metrics tend to be the most standardised and follow the scope 1 (direct emissions), 2 (indirect emissions) and 3 (upstream and downstream emissions along the value chain) definition set out by TCFD. Yet, discrepancies can occur between rating providers. Some may use GHG emissions as a gross figure in tonnes of CO₂ equivalent, whereas others may use a net figure or an intensity ratio (e.g. as a weighted average against company revenues). In addition, the activities included within each scope metric is debated. Rating providers keep their full methodology proprietary, but as an example of how this might differ using indirect scope 3 metrics; the tonnes of CO₂ equivalent amount can include or omit many items from the processing of the sold product, use of the sold product, to end-of-life treatment, with companies having quasi-discretion to account for those that can be measured. In addition, some rating providers may use only disclosed company information of emissions, whereas other ratings providers may complement disclosed information with a modelled estimate of emissions.

These findings highlight a number of key issues. First, the environmental pillar in general is broad in scope and multifaceted in terms of types of metrics and categories considered. Second, even in the more standardised metric categories such as emissions, the possibility for discretion in measurement can yield different results across rating providers. Third, gaps in data can lead rating providers to develop modelled estimates which do not follow a standardised methodology.

5. Conclusion

This report acknowledges that the E pillar has been instrumental in combining a wide range of information that draws new attention to environmental factors. E scores include valuable information on outputs such as emissions and waste; climate change scenarios and risk management; as well as strategies to transition to renewable energy. The disclosure of climate-related factors are of critical importance to institutional investors that are trying to meet the enormous demand by investors for products that either/both align with sustainability, in terms of long-term financial returns and/or with climate transition. As well, this type of information is of growing importance as a number of public sector authorities, from central banks to financial supervisors, contemplate how to incorporate climate risk and environmental resilience into their policy-making.

Notwithstanding encouraging progress, this report finds that several aspects of the E pillar within ESG rating methodologies suffer from high levels of inconsistency and are strained by an attempt to serve different stakeholder interests without sufficiently clarifying the distinctions. In this respect, rating methodologies are attempting to integrate different information that serve disparate investor needs, which may undermine the value of the composite scores based on relevant but disparate underlying metrics and information. Should the current state of the E pillar not advance amid growing use of ESG ratings, it could eventually impact market integrity and investor trust.

The lack of alignment of E and overall ESG scores, at least by some providers, indicates that high-ESG portfolios are not necessarily aligned with strong environmental performance or low-carbon activities. Despite increasing indications that high-ESG portfolios are sought by a range of institutional and retail investors as a vehicle to align with climate transition, they will need to conduct more thorough due diligence to better understand how the scores of the rating provider that rates the assets in the portfolio incorporates and weighs such factors. As such information is not widely available, there is a risk that investor expectations may not be met.

The lack of alignment of E scores with emissions raises questions as to the extent to which ESG integration is a sufficient tool to promote greening of financial systems. For some of the providers analysed, a higher E score corresponds to higher emissions of CO₂ in the environment. Even among large funds that follow sustainable strategies, we notice discrepancies as the majority of funds apply negative screening allowing little improvement from the market index in terms of overall company-specific exposures. This methodology can reduce the total amount of emitted CO₂ represented in the portfolio by companies, but increases the average CO₂ for the most polluting industries (and in some cases both increase). In light of these findings, the Environmental pillar may not be fit for purpose for investors who seek to reduce the carbon footprint of their portfolios.

While metrics used by ESG ratings providers to measure the E score centre around a core set of categories, the type and number of metrics used, weighting of metrics, and ratings judgment can differ substantially depending on the rating provider. In this respect, the portion of metrics that relate to effects on the environment (for example through direct and indirect emissions) make up only a small share of the total metrics used by rating providers. Findings suggest that long term policies are reflected into the E pillar ratings in contrast to measures of negative outputs such as carbon emissions. Yet, the use of metrics that relate to climate risk management, governance and opportunities in renewables can also leave room for interpretation and subjective analysis, which has an impact on the overall E-score.

The key factor is that the E pillar includes a host of metrics that, in addition to emissions, incorporate information about risk management of climate transition and physical risks, including corporate strategies to transition to greater use of renewables. Metrics related to emissions and other outputs (e.g. waste) can shed light on the present effect of corporate behaviours on the environment. However, when such information is combined with information about climate risk mitigation and renewable energy strategies, it is difficult to determine the extent to which the aggregation of these factors into a single score provides sufficient meaning to investors that wish to construct low-carbon portfolios. While a range of analytical approaches enrich diversity of market views that contribute to price discovery, the concentration and lack of transparency of key ESG rating providers' methodologies suggest that users may not be able to interpret why issuers received high or low E scores by different raters. In sum, the aggregation of these metrics that serve different purposes for different stakeholders is suboptimal and would benefit from greater transparency and clarity.

As an increasing number of investors look to invest in environment and climate transition products, a more standardised or comparable approach across rating providers may support more sustainable capital realignment away from carbon intensive economic activities. This report gives attention to where there is a lack of consistency across rating providers and identifies areas that may give rise to constraints. Also, further consideration may be given to the extent to which the rationale of corporate reporting frameworks consider materiality in the environmental pillar and the extent to which it is aligned with carbon transition. Greater clarity from corporate reporting frameworks on their approach as to what constitutes material information in the context of environment would be beneficial in future. For the E pillar to be most useful to investors with differing motivations, methodologies to generate E pillar scores will need to further develop in order to contain metrics that clearly align with financial materiality and distinct aspects of environmental alignment in a mutually exclusive and transparent manner, where possible, so that investors have no doubt as to what is driving the E score.

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Annex A. Environmental pillar metrics

Table A A.1. Environmental pillar metrics across selected rating providers and reporting standards frameworks

Provider 3 (115)	Provider 2 (26)	Provider 1 (27)	GRI (34)	TCFD (28)	SASB (29)	Nasdaq (17)
CO2 Equivalent Emissions Total	Three-year trend of average carbon emissions intensity (-1, 0, 1)	GHG/Revenue	Materials used by weight or volume	Total emissions (by type of GHG, by source, by Scope 1, 2, and 3)	Total amount, in CO2 equivalents, for Scope 1	Total amount, in CO2 equivalents, for Scope 1
Policy Emissions		Energy/Revenue	Percentage of materials used that are recycled input materials	Emissions per output scaling factor (e.g., revenues, sales, units produced)	Total amount, in CO2 equivalents, for Scope 2	Total amount, in CO2 equivalents, for Scope 2
Targets Emissions	Three-year average carbon emissions intensity (tCO _{2e} / USD million sales) relative to GICS Industry peer median (-1,0,1)	Water/Revenue	Energy consumption within the organisation	Emissions per unit of fossil fuel reserves	Total amount, in CO2 equivalents, for Scope 3	Total amount, in CO2 equivalents, for Scope 3
Biodiversity Impact Reduction	Climate Change Controversies (-1, 0)	Waste/Revenue	Energy consumption outside of the organisation	Total energy consumption (megawatt hour [MWh] or gigajoules [GJ] per year)	Total GhG emissions per output scaling factor	Total GhG emissions per output scaling factor
Total CO2 Equivalent Emissions To Revenues USD	Reliance on Carbon-Intensive Supply Chain (-1, 0)	Water Recycled %	Energy intensity	Total energy consumed per output scaling factor (e.g., revenues, sales, units produced, floor area)	Sales-weighted emissions of: (1) nitrogen oxides (NOx) and (2) particulate matter (PM)	Total non-GhG emissions per output scaling factor
CO2 Equivalent Emissions Total	Geographic Exposure to Climate Vulnerable Regions (-1,0)	SOx/Revenue	Reduction of energy consumption	Percent of energy by type of energy source (e.g., renewable, hydro, coal, oil, natural gas) (MWh or GJ)	Total water discharge by quality and destination	Total amount of energy directly consumed
CO2 Equivalent Emissions Direct, Scope 1	Business Exposure to Carbon-Intensive Operations (-1,0)	NOx/Revenue	Reductions in energy requirements of products and services	Biodiversity, habitat impact and management	Total weight of waste by type and disposal method	Total amount of energy indirectly consumed
CO2 Equivalent Emissions Indirect, Scope 2	Geographic Exposure to Carbon Regulation (-1,0)	GHG/MBOE	Total water withdrawal by source	Energy management processes	Energy management processes	Total direct energy usage per output scaling factor
CO2 Equivalent Emissions Indirect, Scope 3	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	Carbon Reserves	Water sources significantly affected by withdrawal of water	Energy intensity	Energy intensity	Percentage: Energy usage by generation type
Carbon Offsets/Credits	Geographic Exposure to Carbon Regulation (-1,0)	Oil in Total Production %	Percentage and total volume of water recycled and reused	PM10 and PM2.5 emissions	PM10 and PM2.5 emissions	Total amount of water consumed
Estimated CO2 Equivalents Emission Total	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	%	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity	Biodiversity, habitat impact and management	Biodiversity, habitat impact and management	Total amount of water reclaimed
CO2 Estimation Method	Geographic Exposure to Carbon Regulation (-1,0)	Energy/MBOE		Species impacted by sites or production	Species impacted by sites or production	Does your company follow a formal Environmental Policy? Yes, No
Emissions Trading	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	Water/MBOE		Total energy consumed, (2)	Total energy consumed, (2)	Does your company follow specific waste, water, energy,
Cement CO2 Equivalents Emission	Geographic Exposure to Carbon Regulation (-1,0)	Spills/MBOE				
Climate Change Commercial Risks	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	NOx/MBOE				
Opportunities	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	SOx/MBOE				
Flaring Gases	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	Gas Flaring/MBOE				
Ozone-Depleting Substances	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	GHG/Power Generation				
NOx and SOx Emissions Reduction	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	Fossil Fuels Gen Cap %				
NOx Emissions	Business Exposure to Operations with Land or Ecosystem Disturbance (-1,0)	Renewables Gen Cap %				
	Geographic Exposure to	Water/Power Gen				
		NOx/Power Gen				
		SOx/Power Gen				

Provider 3 (115)	Provider 2 (26)	Provider 1 (27)	GRI (34)	TCFD (28)	SASB (29)	Nasdaq (17)
SOx Emissions	Fragile Ecosystems (-1,0)	Scope 1 GHG/Power Gen	value outside protected areas	meters)	percentage grid electricity, (3) percentage renewable	and/or recycling polices? Yes/No
VOC or Particulate Matter Emissions Reduction	Geographic Exposure to Water Stressed Regions (-1,0)	Airline GHG/Rev Psngr Mi/Km	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	Amount used per output scaling factor (e.g., revenues, sales, units produced) (cubic meters)	Water recycling amount and processes	Does your company use a recognised energy management system? Yes/No
VOC Emissions Reduction	Business Exposure to Water-Intensive Operations (-1,0)	Airline Fuel/Psngr Mi/Km	Habitats protected or restored	Amount withdrawn from areas of high baseline water stress (cubic meters)	Total weight of waste by type and disposal method	Does your Board of Directors oversee and/or manage climate-related risks? Yes/No
Particulate Matter Emissions Reduction	Environmental Impacts on Communities Controversies (-1, 0)	Airline Load Factor %	Total number of iucn red list species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	Sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles	Sales-weighted fuel efficiency for non-road equipment	Does your Senior Management Team oversee and/or manage climate-related risks? Yes/No
VOC Emissions	Operational Impacts on Ecosystems Controversies (-1, 0)	Airline Fleet Avg Age	Direct greenhouse gas (ghg) emissions (scope 1)	Percent of land by cover type (e.g., grassland, forest, cultivated, pasture, urban)	Description of efforts to manage products' end-of-life impacts	Total amount invested, annually, in climate-related infrastructure, resilience, and product development.
Total Waste To Revenues USD	Environmentally Controversial Investments		Energy indirect greenhouse gas (ghg) emissions (scope 2)	Annual change in land cover type		
Waste Recycled To Total Waste	Raw Material Impact Controversies (-1, 0)		Other indirect greenhouse gas (ghg) emissions (scope 3)	Percent of land used for agriculture tillage, grazing practices, sustainability practices, or conservation practices		
Total Hazardous Waste To Revenues USD	Water Stress Controversies (-1, 0)		Greenhouse gas (ghg) emissions intensity	Locations within a coastal zone		
Waste Total	Business Exposure to Operations Producing High Levels of Packaging Waste (-1,0)		Reduction of greenhouse gas (ghg) emissions	Locations within a designated flood zone		
Non-Hazardous Waste	Business Exposure to Operations Producing High Levels of Toxic Emissions and Waste (-1,0)		Emissions of ozone-depleting substances (ods)	Amount invested in developing low-carbon products, services and/or technology		
Waste Recycled Total	Toxic Emissions & Waste Controversies (-1, 0)		Nox, sox, and other significant air emissions	Amount invested in deployment of low-carbon technology, energy efficiencies, etc.		
Waste Recycling Ratio	Alternative Energy Products and Services (1, 0)		Total water discharge by quality and destination	Amount invested in resiliency capabilities		
Hazardous Waste	Energy Efficiency Products and Services (1, 0)		Total weight of waste by type and disposal method			
Waste Reduction Initiatives	Green Building Products and Services (1, 0)		Total number and volume of significant spills			
e-Waste Reduction	Pollution Prevention and Control Products and		Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel			
Water Pollutant Emissions To Revenues USD						
Water Discharged						
Water Pollutant Emissions						
ISO 14000 or EMS						
EMS Certified Percent						
Environmental Restoration Initiatives						
Staff Transportation Impact Reduction						
Accidental Spills						
Environmental Expenditures Investments						
Environmental Expenditures						
Environmental Provisions USD						
Environmental Investments Initiatives						
Emission Reduction Target Year						
Environmental Products						
Eco-Design Products						
Env R&D Expenditures To Revenues USD						
Environmental R&D Expenditures						

Provider 3 (115)	Provider 2 (26)	Provider 1 (27)	GRI (34)	TCFD (28)	SASB (29)	Nasdaq (17)
Noise Reduction Fleet Fuel Consumption Hybrid Vehicles Fleet CO2 Emissions Environmental Assets Under Mgt Equator Principles Equator Principles or Env Project Financing Environmental Project Financing Nuclear Nuclear Production Labelled Wood Percentage Labelled Wood Organic Products Initiatives Product Impact Minimization Take-back and Recycling Initiatives Product Environmental Responsible Use GMO Products Agrochemical Products Agrochemical 5 % Revenue Animal Testing Animal Testing Cosmetics Animal Testing Reduction Renewable/Clean Energy Products Water Technologies Sustainable Building Products Real Estate Sustainability Certifications Revenue from Environmental Products Fossil Fuel Divestment Policy Resource Reduction Policy Policy Water Efficiency Policy Energy Efficiency Policy Sustainable Packaging Policy Environmental Supply Chain Resource Reduction Targets Targets Water Efficiency	Services (1, 0) Sustainable Water Products and Services (1, 0) Geographic Exposure to Chemical Safety Regulations (-1,0) Involvement in Business Commonly Reliant on High Concern Chemicals (-1, 0)		convention i, ii, iii, and viii, and percentage of transported waste shipped internationally Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organisation's discharges of water and runoff Extent of impact mitigation of environmental impacts of products and services Percentage of products sold and their packaging materials that are reclaimed by category Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations Significant environmental impacts of transporting products and other goods and materials for the organisation's operations, and transporting members of the workforce Total environmental protection expenditures and investments by type Percentage of new suppliers that were screened using environmental criteria Significant actual and potential negative environmental impacts in the supply chain and actions taken Number of grievances about environmental impacts filed, addressed, and resolved	Describe the board's oversight of climate related risks and opportunities. Describe management's role in assessing and managing climate related risks and opportunities. Describe the climate related risks and opportunities the organisation has identified over the short, medium, and long term. Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning Describe the resilience of the organisation's strategy, taking into consideration different climate related scenarios, including a 2°C or lower scenario. Describe the organisation's processes for identifying and assessing climate related risks. Describe the organisation's processes for managing climate related risks. Describe how processes for		

Provider 3 (115)	Provider 2 (26)	Provider 1 (27)	GRI (34)	TCFD (28)	SASB (29)	Nasdaq (17)
Targets Energy Efficiency Environment Management Team Environment Management Training Environmental Materials Sourcing Toxic Chemicals Reduction Total Energy Use To Revenues USD Renewable Energy Use Ratio Renewable Energy Supply Energy Use Total Energy Purchased Direct Energy Produced Direct Indirect Energy Use Electricity Purchased Electricity Produced Cement Energy Use Renewable Energy Purchased Renewable Energy Produced Renewable Energy Use Green Buildings Water Use To Revenues USD Water Withdrawal Total Fresh Water Withdrawal Total Water Recycled Environmental Supply Chain Management Environmental Supply Chain Monitoring Env Supply Chain Partnership Termination Land Environmental Impact Reduction Environmental Controversies Total Renewable Energy			through formal grievance mechanisms	identifying, assessing, and managing climate related risks are integrated into the organisation's overall risk management Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process. Describe the targets used by the organisation to manage climate related risks and opportunities and performance against targets.		

Note: Metrics based on information shared by rating providers and publically available information on company reporting frameworks. Importantly, the level of depth of metrics, and their final form vary across providers (for example, some are composite indicators with a number of sub-metrics used to calculate, whereas others take the form on individual sub-metrics. Lack of available information to a comparable level of detail has been made publicly available, SASB metrics have been collected from individual industry guidance to give a full selection.
 Source: Bloomberg, MSCI, Thomson Reuters, TCFD, GRI, SASB, and Nasdaq, OECD research.

Notes

¹ According to the European Commission, sustainable finance generally refers to the process of integrating environmental, social and governance (ESG) considerations when making investment decisions in the financial sector, with the intended aim to increase long-term investments in sustainable economic activities and projects.

² See the Taskforce for Climate-related Financial Disclosure (2017) “Final Report: Recommendations on Climate-related Financial Disclosures.”

³ Two of the recommendations by the Network for the Greening of the Financial System include: Integrating climate-related risks into micro-supervision and financial stability monitoring, and integrating sustainability factors into central bank portfolio management. The network’s survey showed that 25 central banks already adopted SRI principles in their investment approach (or were planning to do), ranging from environmental, social, and governance (ESG) considerations to a climate-specific focus.

⁴ Rating providers have been selected based on two criteria: 1) information is made available commercially and upon subscription, and as a result is available to the OECD; 2) are increasingly relied on by market participants, even in the event that they conduct their own analysis using the underlying information. Further assessment may be warranted to better understand the extent to which these findings hold with a wider selection of rating providers, subject of obtaining reliable information to support this assessment.

⁵ With reference to absolute ESG ratings and E scores.

⁶ Referring to Thomson Reuters Business Classification 50: Energy (5010: Fossil fuels; 5020: Renewable energy; 5030: Uranium.)

⁷ As greater information becomes available, it will be valuable to assess the sensitivity of categories of metrics within the E pillar to understand what is driving the wide range in scores and lack of alignment with company emissions. The analysis in this report aims to provide an initial assessment of publicly available information relating to E score methodologies.

⁸ Best in class scoring is a form of reweighting by industry, ensure that there are ranges that include high E, S, and G scores in each industry.

⁹ There is no single definition of environmental materiality. For the purpose of this paper, a working definition, adapted from Global Reporting Initiative, is: those topics that have a direct or indirect impact on an organisation’s ability to create, preserve or erode environmental value for itself, its stakeholders and society at large. (see GRI G4 Guidelines).

¹⁰ NGFS website (2020), Origin and Purpose, <https://www.ngfs.net/en/about-us/governance/origin-and-purpose>

¹¹ For example. DeNederlanscheBank (2019), Responsible Investment Charter, and; Banque de France (2018) Responsible Investment Report.

¹² For example, see Mark Carney's, Governor of the Bank of England, speech on '[Transition in Thinking and Action](#)' at the International Climate Risk Conference for Supervisors, in Amsterdam, 6 April 2018.

¹³ R-squared (R^2) is a statistical measure that represents the proportion of the variance for a dependent variable that's explained by an independent variable or variables in a regression model. While correlation explains the strength of the relationship between an independent and dependent variable, R-squared explains to what extent the variance of one variable explains the variance of the second variable.

¹⁴ https://www.refinitiv.com/content/dam/marketing/en_us/documents/fact-sheets/esg-carbon-data-estimate-models-fact-sheet.pdf

¹⁵ See ICMA (2018), "Green Bond Principles", and EU (2020), "Green Bond Standard."

¹⁶ S&P500 ESG: <https://us.spindices.com/indices/equity/sp-500-esg-index-usd>;
STOXX 600 ESG-X: <https://www.stoxx.com/index-details?symbol=SXXPEGX>;
MSCI World ESG Screened: <https://www.msci.com/documents/10199/868074a7-691a-6872-00e7-bcb33275ef7c>; MSCI World ESG Leaders: <https://www.msci.com/documents/10199/db88cb95-3bf3-424c-b776-bfdcca67d460>

¹⁷ For example, the S&P 500 ESG Index excludes tobacco, controversial weapons, and companies not in compliance with the UN Global Compact (UNGC); the STOXX 600 excludes companies non-compliant with international standards, involved in Controversial Weapons, Tobacco Producers and that either derive revenues from Thermal Coal extraction or exploration, or, have power generation capacity that utilises thermal coal

¹⁸ The industries are grouped in Economic sectors as per Refinitiv data for ease of analysis. The economic sectors were selected according to the most polluting industries as provided by the IEA data: <https://www.iea.org/data-and-statistics/?country=WORLD&fuel=CO2%20emissions&indicator=CO2%20emissions%20by%20sector>

¹⁹ Energy sector is chosen for illustrative purposes. Other sectors may of course have high emissions levels measured by either Scope 1,2 or 3 definitions.

²⁰ The MSCI World Leaders include securities of companies with the highest MSCI ESG ratings representing 50% of the market capitalisation in each sector and region of the parent Index.

²¹ EU Technical Expert Group on Sustainable Finance (2019), "TEG Final Report on Climate Benchmarks and Benchmarks' ESG Disclosures."

²² See Annex A for a complete list of metrics.

²³ Bloomberg (2019), MSCI (2019) and Thomson Reuters (2017) have been used to as the publically available source of the frameworks and categories used by ratings providers. Individual metrics as sourced in the annex, and referred to throughout the document have been

shared with the Secretariat by the rating provider (not for publication), or downloaded from the Bloomberg Terminal and Thomson Reuters Refinitiv platforms. Please note the number of metrics refer to those that are disclosed by rating providers, and may be composite indicators that use multiple metrics in the generation of these.

²⁴ Provider 1 and 2 include metrics on scope 1, 2 and 3, whereas provider 3 only includes scope 1 metrics.

²⁵ From publically available information: MSCI,(2019) state that “To understand whether a company is adequately managing a key ESG risk, it is essential to understand both what management strategies it has employed and how exposed it is to the risk. The MSCI ESG Ratings model measures both of these: risk exposure and risk management.”, and; Thomson Reuters (2019) note that the measurement of resource use management is important as well as strategies that help gauge “a company’s commitment and effectiveness towards reducing environmental emission in the production and operational processes.”

²⁶ Sub-metrics for MSCI are propriety, so without access to these, one cannot analyse consistency with other rating providers that use a wider selection of value quantitative metrics.

²⁷ See World Federation of Exchanges: <https://www.world-exchanges.org/our-work/articles/wfe-esg-guidance-june-2018>.

www.oecd.org/finance/financial-markets/

