TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

2024 UK ENTITY-LEVEL SUPPLEMENT REPORT

Russell Investments

Contents

Introduction

Russell Investments Limited ("RIL") is a UK-based, FCA authorised asset manager with $41bn[1] AUM as of 31 December 2023. The firm has Russell Investments Systems Limited ("RISL") as its parent, which is a UK holdings company and is unregulated. RISL is wholly owned by Russell Investments Group Limited ("RIGL"), a Cayman Islands registered company.

As a global investment solutions provider, RIGL utilises a global operating model with respect to its strategic and investment management approaches, including its approach to climate risks and opportunities. This UK addendum is supplemental to and should be read in conjunction with our Global TCFD report 2024.

Please note that the data in the UK entity TCFD 2024 supplement and the global TCFD report 2024 covers the reporting period 1 January 2023 to 31 December 2023. The addendum and global TCFD report provide disclosures in accordance with the Financial Conduct Authority (FCA's) requirements.[2]

Compliance statement

This report is the first annual TCFD Entity Report that has been prepared for Russell Investments Limited UK ("RIL UK") pursuant to chapter 2 of the FCA's ESG Sourcebook. It relates to the reporting period from 1 January 2023 to 31 December 2023. As a UK authorised firm specialising in portfolio management services, RIL is subject to specific reporting requirements. The report covers the range of asset classes and investment strategies managed by RIL, including sovereign debt, corporate debt, and public equities. RIL ensures transparency in its approach, particularly highlighting any distinct strategies employed for different asset classes to maintain clarity and accountability in its ESG reporting.

[1] Considers OCIO mandates, segregated funds and institutional funds for which data is available.
[2] PS21/24 Enhancing climate-related disclosures by asset managers, life insurers and FCA-regulated pension providers.

Foreword

As fiduciaries, our duty is to consider all factors that influence financial performance and client capital. The climate, which shapes our daily lives and yields substantial implications for financial markets, continues to play an important role in this context. Whether it is the risks associated with the increasing frequency of extreme weather events, or the opportunities of a carbon-conscious economy - the climate is shaping market dynamics, asset values, and investment returns. Our commitment to address climate-related risks and capitalise on emerging opportunities is fundamental to our mission of protecting and enhancing our clients' investments.

In this report, we detail how we assess and manage climate-related risks and opportunities through comprehensive governance, strategic planning, risk management processes, and via detailed metrics and analysis. Our scale and multi-manager platform help deepen our understanding of the climate's impact on financial markets and influences on our client's portfolios.

Our TCFD report is a testament to our unwavering commitment to our clients, showcasing how we incorporate climate-related risks into our analysis and our dedication to transparency. It highlights our efforts to provide in-depth insights and to align investment portfolios with a future that is both sustainable and resilient.

In this context, I am proud to present our latest report in line with the recommendations of the TCFD, underscoring our unwavering dedication to enhancing the financial security of our clients in an ever-changing global landscape.

Kate El-Hillow

President and Chief Investment Officer, Russell Investments

Summary disclosure against TCFD recommendations

The TCFD's recommended disclosures are organised according to the four pillars of Governance, Strategy, Risk Management and Metrics & Targets. Below, we provide a summary of our disclosures against the 11 recommendations, as well as the location of relevant disclosures in our report. This UK entity report follows the same structure, but to avoid duplication we have made references to the global report.

Exhibit 1: TCFD disclosure summary

TCFD PILLARS	RECOMMENDED DISCLOSURE	SUMMARY DISCLOSURE	SECTION
GOVERNANCE	Describe the board's oversight of climate-related risks and opportunities	Russell Investments Board of Directors is ultimately responsible for strategic priority, corporate governance and long-term stewardship of the firm. The Board has delegated oversight of the management of climate-related risk to the Executive Committee (ExCo).	1
	Describe management's role in assessing and managing climate- related risks and opportunities.	The ExCo provides oversight of the firm's strategy and investment risk as it relates to climate-related considerations, both directly and through delegated entities including the Investment Strategy Committee and the Global Risk Management Committee.	1
STRATEGY	Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.	Climate-related investment risks and opportunities include identified transition and physical risks and opportunities in our portfolios, and are detailed in exhibit 2 of section 2a, along with relevant time horizons.	2a
	Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	Impact on the investment process is material and detailed in section 2. Business operational footprint and targets are set out in Section 3.	2, 3
	Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Scenario analysis of investment portfolios detailed in section 2b	2b
RISK MANAGEMENT	Describe the organisation's processes for identifying and assessing climate-related risks.	Carbon footprinting and scenario analysis identified as key tools. Further details supplied in Section 2.	2a, b
	Describe the organisation's processes for managing climate-related risks.	Formal policies, enhanced practices, active ownership, carbon-managed portfolios and target setting. Further details supplied in Section 2.	2c
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.	Detailed in section 2 and governance sections.	2a, 1
METRICS & TARGETS	Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.	Carbon emissions (WACI and financed emissions), scenario analysis, supplemented by temperature alignment and climate solutions.	2b
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Detailed in section 2.	2b
	Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.	See section 2d for a description of our Net Zero by 2050 Commitment.	2d

Section 1: Governance of climate-related risks and opportunities

Board-level oversight, escalation and management of climate-related risks and opportunities follow our RIGL global operating model. For details, please refer to the "1. Governance of climate-related risks and opportunities" section of the Global TCFD report 2024.

Summary

The Russell Investments' Board, through the Executive Committee (EC) and Audit and Risk Committee, and under the Investment Strategy Committee, has delegated oversight of the risks associated with climate change to our Responsible Investing Councils (the Investment Division Responsible Investing Council and the GTM Responsible Investing Council) as well as the Global Risk Management Committee. The Global TCFD report is tabled annually at the Audit and Risk Committee meeting and provides the Board with an opportunity to further deepen their understanding of the firms' exposure to climate risk. The EC also allocates resources to enhance our climate-related capabilities.

Section 2: Climate risks and opportunities of investment portfolios

In line with the TCFD framework, we begin by identifying climate risks and opportunities and include relevant measurement tools and time horizons. We then assess these risks and opportunities using carbon footprint metrics and scenario analysis. Finally, we outline our management of climate-related issues. This includes our sustainability risk policy, enhanced oversight practice, active ownership process, carbon-managed portfolios, and target setting.

For background

Throughout our report, we preface topics that benefit from additional detail with a "For Background" section, in this format. Readers building familiarity with these concepts may find these sections useful, while others may prefer to skip directly to disclosures.

2a. Identification of climate-related risks and opportunities

The first step in managing climate-related risks in investments is identifying them. There are many mechanisms through which climate-related factors impact security prices, but these risks can be broadly categorised as transition or physical risks. We recognise that different risks are likely to manifest over different time horizons and that they require different tools to assess, as outlined below.

Exhibit 2: Snapshot of the climate risk identification and assessment process

RISK OR OPPORTUNITY IDENTIFIED	DESCRIPTION	EXAMPLES OF ASSESSMENT TOOLS	MOST RELEVANT TIME HORIZON
Transition risks & opportunities	Risks arising from the shift to a low carbon economy	Scenario analysis (esp. transition scenarios), metrics	Medium-term
• Changes in cost	Price on carbon, costs of abatement	Carbon footprinting metrics	Short and medium-term
• Changes in demand	Demand destruction and creation arising from shifts in demand	Scenario analysis (esp. transition scenarios), metrics on green revenues or climate solutions, exposure to potentially stranded assets	Short and medium-term
Physical risks	Physical risks can be event driven (acute) or longer-term shifts (chronic) in climate patterns	Scenario analysis, (esp. hot house world scenarios)	Long-term
• Acute	Increased severity of extreme weather events	Scenario analysis (esp. hot house world scenarios), asset-level risk mapping	All but increasing severity long-term
• Chronic	Changes in weather patterns, rising temperatures, rising sea levels	Scenario analysis (esp. hot house world scenarios), estimated sensitivity to productivity impacts, heating/cooling days	Medium and long-term

Climate risk is characterised by a longer time horizon than many traditionally managed risks. To make this more explicit, short-to-medium-term horizons in this document refer to a three-to-ten-year horizon, and a long-term horizon refers to the period out to 2050, although we note these are rough approximations.

A note on the RIL UK Portfolio

As an outsourced CIO provider, Russell Investments manages portfolios that are multi-asset and multi-manager. RIL follows the global RIGL approach towards climate metrics and targets.

For the sake of understanding RIL's exposure to climate-related risks and opportunities, we aggregated approximately 79% of RIL's traditional assets[3] under management which include:

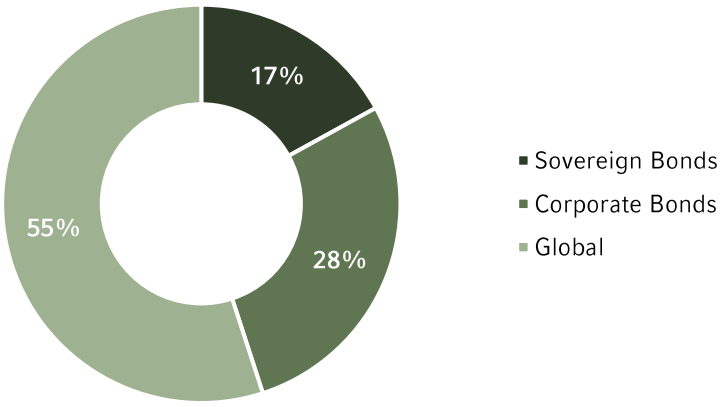
1. OCIO client assets
2. Segregated client accounts
3. Institutional funds

Similar to the analysis contained in the global report, we have chosen to focus this analysis on listed equities, corporate debt, and sovereign debt because this is where we have the most confidence in the available data. As data quality and availability improve across private assets and alternatives, we plan to expand upon this initial analysis in subsequent reports. Russell Investments also offers more bespoke analysis on private markets portfolios through a climate-lens where this a part of the mandate.

Exhibit 3: Summary of the Russell Investments' Sample UK Entity Portfolio

	TOTAL AUM COVERED	% SOVEREIGN BONDS	% CORPORATE BONDS	% EQUITY
Russell Investments' Sample UK Entity Portfolio	$41Bn	17%	28%	55%

Russell Investments' Sample UK Portfolio Asset Allocation



Source: Russell Investments

[3] Excluding assets managed for investments services such as transition management.

2b. Assessment of climate-related risks in investment portfolios

There are several methodologies available to assess the climate exposure of an investment portfolio. In our own analysis, we have focused on two primary pillars for our core assessment:

1. Carbon footprinting
2. Scenario analysis

The primary pillars of carbon footprinting and scenario analysis are supplemented with an additional metric, a temperature alignment score. This is an appealing metric; it is easy to interpret for non-expert stakeholders and therefore, we expect to continue using it in our assessment process. However, we note considerable variation exists in current methodologies for the temperature alignment metric, as detailed in the sections that follow.

By measuring our exposure using this multidimensional approach, we hope to develop a more robust understanding of risk exposures on a current and forward-looking basis. This, in turn, helps us build a corresponding strategy to manage the identified risks.

For more information on the different types of carbon footprinting considered by Russell Investments, please see the Appendix.

Russell Investments' UK portfolio carbon emission metrics

Exhibit 4: Weighted Average Carbon Intensity (WACI)

FUND	WACI- SCOPE 1 (TCO2EQ PER MILLION USD REVENUE)	WACI- SCOPE 2 (TCO2EQ PER MILLION USD REVENUE)	WACI- SCOPE 3 (TCO2EQ PER MILLION USD REVENUE)
Russell Investments UK Portfolio	85	38	660
MSCI World Index	83	23	702
MSCI Emerging Markets Index	266	62	969
Bloomberg Global Aggregate Credit	180	29	936

Source: Russell Investments, MSCI, Bloomberg, Portfolio, and emissions data as of 31 December 2023.

Exhibit 5: Financed Emissions

FUND	FINANCED EMISSIONS – SCOPE 1 (TCO2EQ)	FINANCED EMISSIONS – SCOPE 2 (TCO2EQ)	FINANCED EMISSIONS – SCOPE 3 (TCO2EQ)
Russell Investments' Portfolio	1,364,356	394,021	10,681,545

Source: Russell Investments, MSCI, Portfolio, and emissions data as of 31 December 2023.

Exhibit 6: Carbon footprint

FUND	FINANCED EMISSIONS – SCOPE 1 (TCO2EQ / $MIL INVESTED)	FINANCED EMISSIONS – SCOPE 2 (TCO2EQ / $MIL INVESTED)	FINANCED EMISSIONS – SCOPE 3 (TCO2EQ / $MIL INVESTED)
Russell Investments' Portfolio	48	14	378

Source: Russell Investments, MSCI, Portfolio, and emissions data as of 31 December 2023.

Exhibit 7: Sovereign bonds

FUND	GHG INTENSITY (T/USD MILLION GDP NOMINAL)	GHG PER CAPITA (TCO2EQ PER CAPITA)	GHG OWNERSHIP (TCO2EQ)
Russell Investments Portfolio	213	9	2,301,357
FTSE World Government Bond Index	274	13	N/A

Source: Russell Investments, MSCI, FTSE, Portfolio, and emissions data as of 31 December 2023.

Exhibit 8: Data quality

FUND	CARBON DATA REPORTED	CARBON DATA ESTIMATED	CARBON DATA UNAVAILABLE
Russell Investments Portfolio	83%	12%	5%

Source: Russell Investments, MSCI, Portfolio, and emissions data as of 31 December 2023.

On their own, carbon metrics can be challenging to interpret, however, they serve as a useful baseline for tracking progress against emission reduction targets over time. Comparing the carbon metrics to common benchmarks can also provide useful context.

Key observations from carbon footprint assessment:

- The UK entity portfolio has a meaningfully lower Scope 1 and Scope 3 weighted average carbon intensity than the global portfolio (the global portfolio's Scope 1 was 126 tCO2eq per million USD revenue and Scope 3 was 801 tCO2eq per million USD revenue respectively), implying, the UK entity portfolio may be slightly less exposed to transition-related climate risks. Interestingly, the UK entity portfolio's Scope 2 weighted average intensity is larger than the global portfolio (33 tCO2eq per million USD revenue). While the global portfolio already has a lower sovereign GHG intensity than the FTSE World Government Bond Index (249 t/USD million GDP nominal), the UK entity has an even lower GHG intensity. This is due to a larger relative exposure to UK gilts (which have a relatively lower GHG intensity) within the UK entity portfolio.

Looking forward:

- We will continue to track carbon metrics to understand the organic decarbonisation taking place in the broad market, in addition to tracking our relative exposure over time.
- To supplement our tracking, we have developed new capabilities that allow us to understand and attribute the decarbonisation that is achieved within portfolios; allowing us to categorise carbon emission reductions into security selection, sector rotation, and/or from firms organically reducing emissions. This is crucial for understanding if, and where, real world decarbonisation is occurring.
- Targets are placed for reducing exposure to carbon metrics in many of our sustainable strategies. Additionally, reduction targets will feature as one component of our approach to managing portfolios in line with a net zero objective, more details of which are provided in the net zero target setting section below.
- We will continue to evaluate the quality of Scope 3 emissions data and look to phase in broader use of Scope 3 in line with methodologies such as Partnership for Carbon Accounting Financials (PCAF) and the EU's Sustainable Finance Disclosure Regulations.
- We are reviewing methodologies and data sources to allow us to expand the disclosure of carbon emissions to additional asset classes such as private real estate, unlisted infrastructure, and private equity.

Scenario Analysis

In recognition that climate scenarios are both an important component of the TCFD Recommendations but also require considerable domain expertise, Russell Investments partnered with Planetrics to expand our climate risk modelling capabilities. Below we assess the expected impact of different climate scenarios at the portfolio, sector, and asset-class level, and further decompose impact across transition and physical channels.

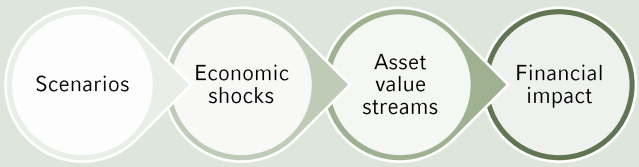
A key input in scenario analysis is the scenario narrative, or the underlying assumptions to each scenario.[4] In the analysis that follows, we use three Network for Greening the Financial System (NGFS) scenarios: the hot house world scenario, a net zero 2050 scenario, and a delayed transition scenario. Details on the key assumptions for each scenario are shown below:

Scenario	Description	Median 2100 warming (unless otherwise stated)	Net zero (CO_2) year	Technology change	Carbon Dioxide Reduction (CDR) assumption	Regional policy variation
Hot House World (Current Policies)	Existing climate policies remain in place, but there is no strengthening of ambition level. Thus, there is no transition risk. Heightened physical risks are assumed through high climate sensitivity, specifically 90th percentile temperature increase (4.2°C by 2100), high levels of ice sheet melt, and higher responsiveness of tropical and European windstorm frequency and intensity to changing temperatures.	4.2°C (90th percentile)	N/A	Slow change	Low use	Low variation
Delayed Transition	Imposes the 2°C target in 2100 and allows for temporary overshoot. Annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2°C. This scenario includes regional carbon price variation. Regional net-zero targets for countries with clear commitments (China, EU, Japan, and USA) are applied from 2030 onwards, but for other countries ambition equivalent to the overall temperature target of below 2°C in 2100 is assumed leading to strong regional differentiation.	1.6°C	N/A	Slow until 2030; fast thereafter	Low/medium use	High variation
Net Zero 2050	Limits global warming to below 1.5°C (the median temperature returns to 1.4°C in 2100, after a limited temporary overshoot) through stringent climate policies and innovation, reaching global net zero CO_2 emissions around 2060. Some jurisdictions such as the US, EU and Japan reach net zero for all GHGs by 2050.	1.4°C	2050	Fast change	Medium/high use	Medium variation

Source: Planetrics based on NGFS Technical Documentation (2022).

These scenarios are the first of a four-step modelling framework which translates climate scenarios into economic shocks, then asset value streams based on company and industry-level data, and finally, discounted back to present value financial impact at a security-level. This methodology was developed by Planetrics.

Four-step climate modelling framework



[4] As recommended in the TCFD guidance, scenario narratives should be relevant, challenging, and distinctive. They should focus on different combinations of the key factors and should illuminate future exposure to both transition and physical climate-related risks and opportunities.

Following the four-step scenario analysis methodology, company-level valuation impacts are assessed by discounting cash-flow estimates from the asset modelling component to a net present value. We model these impacts to both equities and fixed income, although there are some additional asset-class-specific steps required for fixed income securities. The result is a percent gain or loss on the portfolio in each scenario based on a timeline out to 2050, discounted back to today. This provides an estimated financial impact under the different climate scenarios.

Exhibit 9: Climate Scenario Analysis: Impact on Portfolio Value

FUND	SCENARIO	IMPACT ON VALUE TODAY (COMBINED)	IMPACT ON VALUE TODAY (PHYSICAL)	IMPACT ON VALUE TODAY (TRANSITION)
Russell Investments' Portfolio	Hot house world	-0.85%	-0.85%	0.00%
	Delayed transition	-1.99%	-0.22%	-1.92%
	Net Zero 2050	-3.54%	-0.15%	-3.39%

Source: Russell Investments, Planetrics[5] as of 31 December 2023.

Key observations from scenario analysis impact on portfolio value:

- Similar to our global portfolio, the UK entity portfolio experienced the largest valuation impact in the Net Zero 2050 scenario.
- In both the delayed transition and the Net Zero 2050 scenarios, the UK entity portfolio shows a smaller impact than the global portfolio (about one percentage point reduction in each scenario). The hot house world scenario is almost identical between the two portfolios (-0.85% for the UK entity portfolio and -0.84% for the global portfolio)
- Similar to what we found within the global portfolio, the portfolio level valuation impacts mask significant variation within the portfolio at the sector or security level.

Looking forward:

- Quantitative climate scenario analysis is a new tool, and our immediate priority is to make this information more accessible to investment decision-makers, while also recognising we need to upskill to use the information in a critical manner. Fortunately, the climate-data industry is maturing and we are better equipped to understand where these models may be underestimating risks due to model construction and/or a lack of available data.
- Climate risk scenario analysis is complex. Thus, it is unlikely that any single model can sufficiently capture all aspects of future climate risk. This has led us to explore expanding our climate risk capabilities to include additional models designed to analyse specific elements of climate risk, such as individual physical hazards or the interaction with nature-related risks and a changing climate.

[5]This figure has been created by Russell Investments drawing on selected data provided by Planetrics Ltd (which does not include investment advice). The figure represents Russell Investments' own selection of applicable scenarios and/or its own portfolio data. Russell Investments is solely responsible for such scenario selection, all assumptions underlying such selection, and all resulting findings, conclusions and decisions. Planetrics Ltd. Is not an investment adviser and has not provided any investment advice.

Discussion regarding the underestimation of physical risks

It's important to understand that current models for assessing physical climate risks can underestimate how much damage may be caused to investment portfolios. Specifically, climate risk models often fail to incorporate non-linear feedback loops and tipping points that may be triggered by climate change, resulting in an underestimation of the severity and rapidity of potential physical impacts.

The interconnected nature of the global economy also means that effects can cascade, and most models rely on either first order effects or a simplistic extrapolation of past correlations between climate variables and financial metrics. This will further exacerbate the potential for discrepancy between projected and actual outcomes.

However, modelling these tail risks is very challenging. While the Planetrics model focuses on the modelling of physical risk using the expected average annual damages (AAD), individual tail events are currently left out of the model. This means that the estimated average physical impacts could obscure the aggregate impact of a sequence of years with severe acute physical risks. For example, a string of consecutive years with severe weather impacts is likely to cause more disruption than that implied by the average annual damage estimates.

In modelling, it is crucial to understand the potential biases inherent to the model. In the case of the Planetrics physical risk model, the largest impacts are projected to come from flood risk. Since the model does not incorporate asset-level spatial data, due to the lack of high-quality spatial data sets, the modelled impacts are predominantly shown for companies possessing large amounts of physical assets (property, plant, and equipment) on the balance sheet. Consequently, it will be inherently biased against those firms, regardless of the exact location of the assets and whether or not they actually fall within projected flood-prone regions. Conversely, the modelling of other physical risks, like chronic heat, presents a challenge due to the lack of robust observational data that accurately captures the complexity involved with an interconnected global economy and a changing climate.

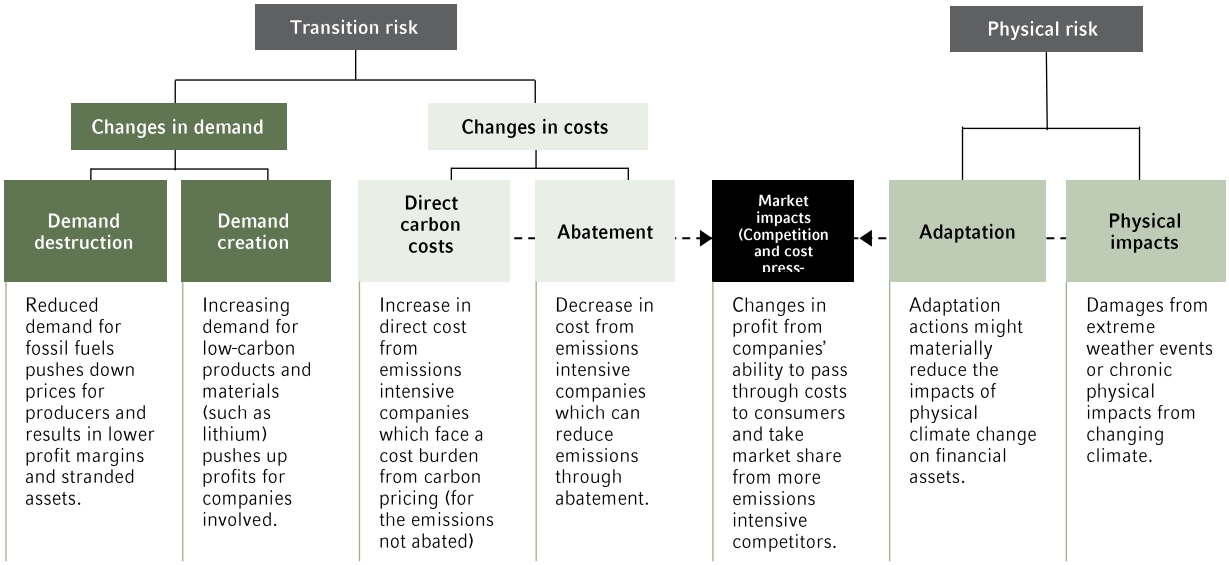
Another key model limitation is coverage of disruptions in the supply chain stemming from physical vulnerabilities. Instances where supply chain disturbances are triggered by physical hazards, like floods or hurricanes, have the potential to impact earnings. This is a recognised gap and the plan moving forward is to incorporate these risks into future iterations of the model.

Finally, when addressing the intricacies of modelling physical climate risks, the timeframe emerges as a critical factor warranting thorough consideration. This is particularly evident in the context of employing discounted cash flow (DCF) models to evaluate potential impacts on asset value. The models used here estimate shocks to cash flows out to 2050, and a terminal value to estimate value beyond that. The terminal value is a key assumption as it is common to assume perpetual and constant growth, an assumption that overlooks the dynamic nature of future climate-related effects. Planetrics attempts to reduce this bias by implementing a one-time shock on the terminal value to capture additional physical risk impacts from 2051 through 2080. This is important, as estimates of non-transition scenarios predict that physical impacts will increase, not cease, beyond the modelling period of 2050. While this is an improvement over many other models, we still expect that physical risk generally, and scenarios where physical risks over longer time horizons are most severe in particular, are likely to be understated.

Portfolio valuation impacts by channel

Building upon the transition and physical risk categories introduced in Table 3, the overall portfolio valuation impacts above can be separated into key risks and opportunities; not only at the level of physical and transition risk, but within these channels too. The following methodology was developed by Planetrics.

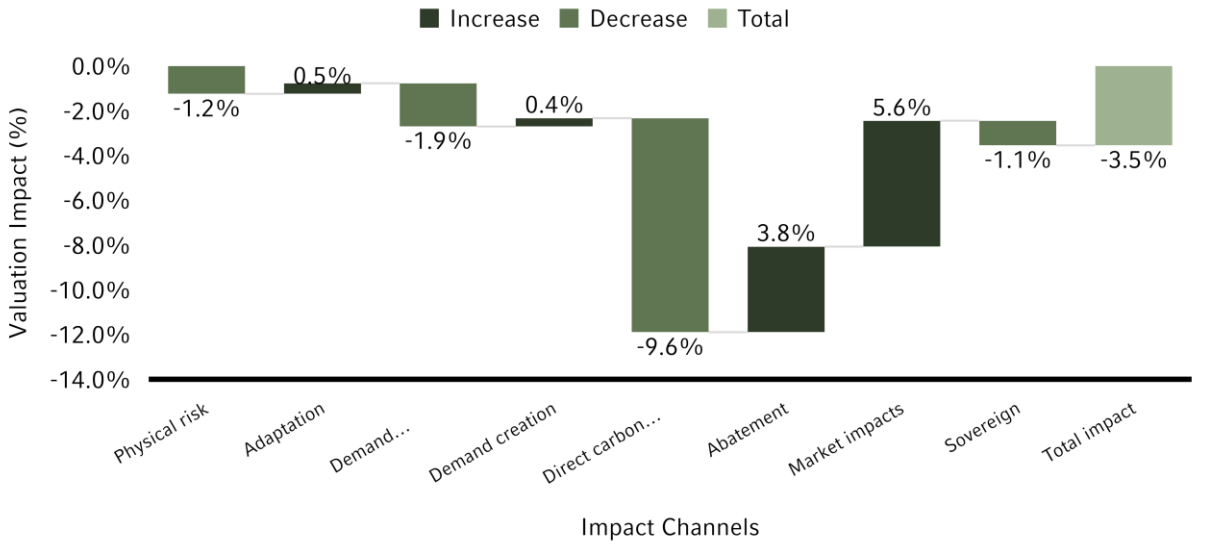
Exhibit 10: Physical and transition risk: seven channels of impact



Source: Planetrics[5].

These channels are estimated at the company level, using company and industry-specific information. Take, for example, a utility company that experiences relatively inelastic demand. An economic shock, such as an increased carbon price, can be partially mitigated through adopting new technologies capable of reducing emissions and by passing through costs to consumers via higher prices, with relatively little impact on asset valuation. The company's valuation may then be impacted (either positively or negatively) by a change in consumer demand. For example, does the utility company generate power from renewables? Finally, the utility company may experience valuation impacts based on its exposure to, and its ability to adapt to, physical hazards. These asset-level estimates are then rolled up to the portfolio level to produce the impact by channel below.

Exhibit 11: Portfolio impacts based on a high transition risk scenario (Net Zero 2050)



Source: Russell Investments, Planetrics[5] as of 31 December 2023.

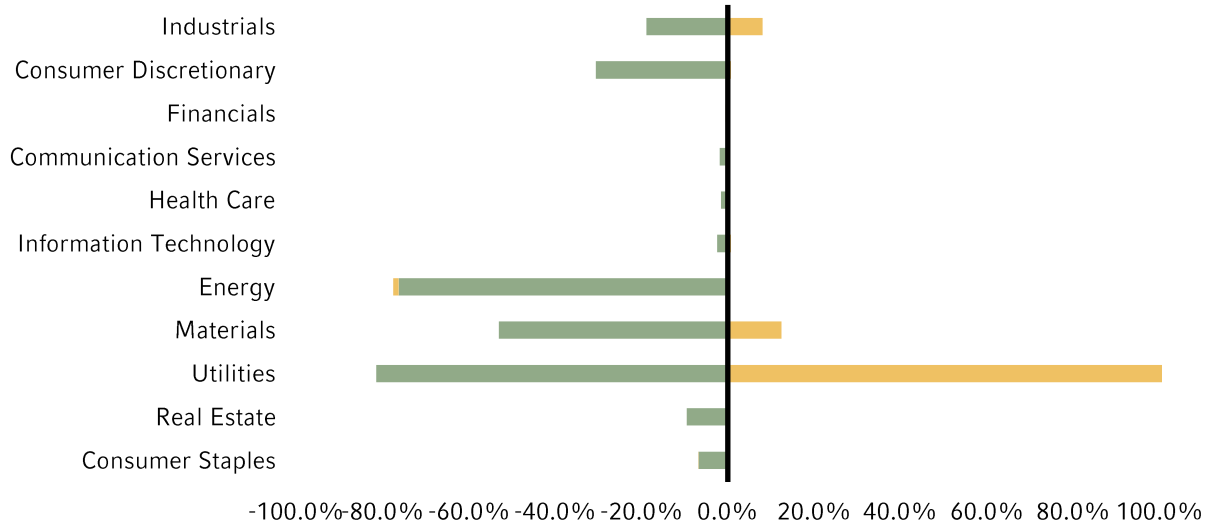
Key observations from portfolio valuation impacts by channel in net zero scenario:

- The main driver of valuation risk is the direct carbon cost channel, responsible for a valuation impact of approximately -10% in both transition scenarios. In terms of magnitude, this swamps the impact of other risks. This reinforces why the transition scenarios exhibited the biggest loss since transition scenarios are where carbon costs are high.
- Firms can abate some of this cost with carbon efficiency measures (abatement) and pass on costs to consumers ("market impact"). Through these measures, firms offset much of the direct carbon cost, and this varies by industry.
- Rounding out the transition lens, demand destruction is about 5x the magnitude of demand creation at the total portfolio level, but again, there are opportunities for demand creation at an individual firm and industry level.
- Physical risk is a relatively smaller valuation impact, at least measured in terms of present value. The firms in our portfolio are estimated to offset roughly half the -1.2% physical impact with adaptation measures. See the section in the global portfolio section regarding model limitations around physical risk financial impacts.

Portfolio valuation impacts by sector allocation

Sector allocation is a key determinant of a portfolio's climate risk exposure, and we find significant variation both among sectors and within sectors. The highest at-risk sector allocations are energy, utilities, and materials. This is not surprising considering these are all high-emitting sectors. It is noteworthy that, within some of these sectors, the impact is very heterogenous: materials, consumer discretionary, industrials, and utilities sectors have a very wide range of winners and losers.

Exhibit 12: Variation of valuation impacts within sectors



Source: Russell Investments, Planetrics[5] as of 31 December 2023.

Key observation from portfolio impacts by sector allocation in net zero scenario:

- These variations, as shown in the chart above, highlight the importance of differentiating between winners and losers in critical sectors like utilities and materials.
- As an example, above we look at the intra-sector variance and show the range between the 10th percentile and the 90th percentile firms within each sector. In utilities, for example, 10% of companies are estimated to lose over 80% of their valuation in the Net Zero 2050 scenario. This is in contrast to other utilities which experience an almost 125% valuation increase (the chart above is truncated to range between -100% and +100%).
- The sector variation within the UK entity portfolio follows a similar pattern as our global portfolio, with utilities having the widest intra-sector variation and energy, materials, and consumer discretionary having the next largest variation among those negatively impacted.

Thoughts on the energy transition

In 2023, the task of trying to better understand the potential implications of the energy transition for investment portfolios was taken on within our Investment Strategy and Research Teams. You can access the full report here, but some of the key findings are highlighted below:

- A transition away from fossil fuels is likely required to avert a significant warming of the planet.
- Net zero targets require the green transition to be twice as fast as past energy transitions.
- Key challenges include politics, intermittency, transmission, and tight supply of raw minerals.
- Failure to transition to a low carbon economy risks physical damage to the global economy.
- There is wide disagreement about these damages - ranging from 8% to 35% of global income in 2100.
- Disruptions to agriculture appear to be the most relevant concern within an investor's time horizon.
- Food price volatility and shortages could challenge lower-income economies.
- The primary risk to markets is the energy transition itself, which would require substantial capital expenditure.
- An investment boom would likely pressure higher long-term interest rates.
- The details of how governments incentivise the transition will inform the growth-inflation mix. Another challenge is that an energy transition is not as simple as just decarbonising electricity generation through the adoption of renewable power. We must address another key aspect of an effective transition: substituting the direct use of fossil fuels.
- Energy transitions are complex and slow processes that have historically taken decades or even centuries to unfold. Today's energy transition, driven by a sense of urgency due to climate change rather than economic factors, needs to be unnaturally speedy to succeed.

Portfolio valuation impacts by asset class

Exhibit 13: Valuation impacts based on asset class

	SCENARIO	VALUATION IMPACT
Equity	Hot house world	-1.51%
	Delayed transition	-2.85%
	Net Zero 2050	-3.41%
Corporate debt	Hot house world	-0.08%
	Delayed transition	-1.09%
	Net Zero 2050	-2.25%
Sovereign debt	Hot house world	0.41%
	Delayed transition	-0.30%
	Net Zero 2050	-4.80%

Source: Russell Investments, Planetrics[5] as of 31 December 2023.

Key observations from portfolio valuation impacts by asset class:

- Similar to our global portfolio, asset class impacts are less prominent than sector impacts
- The larger impact on sovereign debt in transition scenarios can largely be explained by the high inflationary pressure that characterises transition scenarios, due to high carbon prices. Net Zero 2050 requires a sharp increase in carbon prices starting immediately, causing a more immediate shock than the delayed transition[6].
- Duration also plays a role, with longer duration assets generally experiencing larger effects than shorter duration assets. This partially explains why equity assets, which have a longer effective duration, experience bigger impacts than corporate debt.
- Finally, we see that most of the physical risk exposure is concentrated within the equity holdings.

As a multi-asset manager, we are focusing on developing our climate-related approach for other asset classes such as private real estate, private credit, and alternatives. Since data availability and methodologies specific to these asset classes are still developing, we leverage the managers we hire to assess these risks. However, we hope to expand our analysis to incorporate additional asset classes into our scenario analysis exercise in future iterations of this report.

Looking forward

Performing climate scenario analysis can be used to identify asset classes, sectors, mandates, and securities for further investigation and oversight as we assess climate risk in our holdings and look to understand the relative magnitude of risks. Utilising this type of analysis can be quite helpful for our investment professionals. However, climate scenario analysis is still a relatively new process that relies on significant amounts of estimation and simplification of complex data. Therefore, we make sure to supplement this type of analysis with other robust sources of information and will continue to monitor this evolving area of climate analysis. We outline our management of climate-related issues further in section 2c.

[6] More discussion of this relationship can be found in the Portfolio Testing Report from IIGCC available here: https://www.parisalignedinvestment.org/media/2021/03/Portfolio-Testing-Report-IIGCC-Net-Zero-Investment-Framework-1.pdf

Discussion regarding the incorporation of nature-related risks

While the focus of this report is to understand climate-related risks, there is an increasing awareness of the parallels between climate-related risks and natural-capital risks. These include the mismanagement of nature, biodiversity, and ecosystem services; maintenance of which is vital to the global economy. Climate change is intricately interconnected to these risks acting as a key driver of biodiversity loss and causing the degradation and redistribution of ecosystem services. Looking forward, we plan to take a more holistic approach and integrate these risks alongside conventional climate-related risks. In support of this, we have joined the Nature Action 100 as a founding signatory; are members of the Taskforce on Nature-related Financial Disclosures forum; and continue to prioritise natural capital as one of our key areas of engagement focus.

Portfolio temperature alignment

At a portfolio level, we saw the temperature alignment score increase from 3.25-degrees in 2021 to 3.31-degrees in 2022 and then to 3.34 in 2023. This increase occurred in both the MSCI World index and the global bond index, whereas the emerging markets universe (as measured by the MSCI Emerging Markets index) saw a slight decrease in temperature alignment (3.92 in 2022 to 3.89 in 2023).

Both geographical and sector allocations meaningfully drive the aggregate temperature alignment of a portfolio or index. By drilling down to the sector level of our Global Portfolio we can see that significant variation exists between sectors, although no sector has achieved a below 2-degrees Celsius temperature alignment.

Temperature scores, including implied temperature rise and temperature alignment, are a new class of metrics used to assess the alignment of a company or portfolio with the goal of limiting global warming to below 2 degrees Celsius. An advantage of the metrics is that they are designed to be forward-looking and account for inherent differences in carbon emissions across industries and regions. Wide variations exist in methodologies to estimate temperature scores. This class of metrics aims to estimate expected future emissions, and alignment with the sector-region decarbonisation pathways associated with different levels of global warming. The estimate is then translated into a projected increase in global average temperature, above preindustrial levels, which would occur if all companies in the corresponding sector had the same carbon intensity.

While simple in concept, there is a wide divergence in estimates based on who produces temperature scores. Methodologies and final temperature scores can vary considerably depending on subtle choices under the hood. It is a relatively opaque calculation, making it difficult to back into drivers of the differences. For example, at a company-level, do future emission projections consider company targets? What likelihood is assumed a company will reach those? Or are forecasts not company-specific and instead based on sector-region pathways? According to 'which forecasts?' At the portfolio-level, how are temperature scores aggregated? Is it a weighted average? Ownership share? Or emission weighted?

Despite this complexity, and less transparency than more explicit carbon metrics, the appeal of temperature alignment means the use of these metrics is likely to increase, especially as investors look to express portfolio alignment with global temperature targets. We, therefore, will supplement our carbon emission and scenario analysis disclosures with this metric, while noting we still consider these metrics to be in their development phase, and likely to continue to change significantly as methodologies and consistency develops.

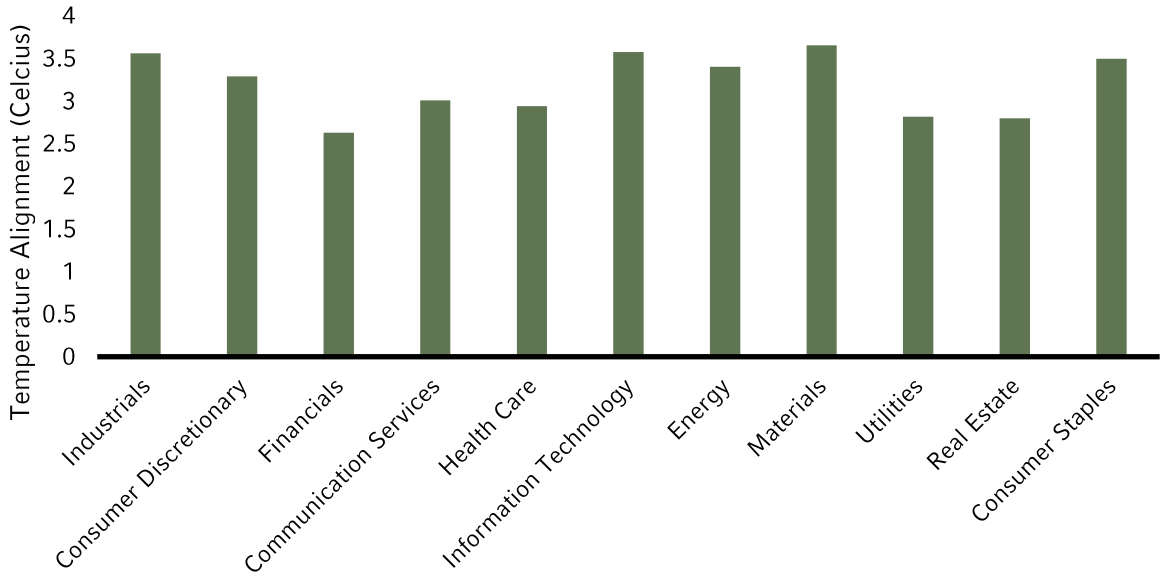
Exhibit 14: Temperature Scores of Russell Investments UK Portfolio & Benchmarks

UNIVERSE	TEMPERATURE ALIGNMENT SCORE (CELSIUS)
MSCI Emerging Markets Index	3.89
MSCI World Index	3.17
Bloomberg Global Aggregate Credit Index	3.30
Russell Investments UK Portfolio	3.30

Source: Data as of 31 December 2023. Russell Investments, Planetrics[5], MSCI, Bloomberg, Value and sector-intensity weights methodology.

At a portfolio level, the UK entity has a temperature score in line with the Bloomberg Global Aggregate Credit index and is slightly higher than the MSCI World index. Both geographical and sector allocations meaningfully drive the aggregate temperature alignment of a portfolio or index. By drilling down to the sector level of our global portfolio, we can see that significant variation exists between sectors, although no sector has achieved a below 2-degrees Celsius temperature alignment.

Exhibit 15: Sector Temperature Alignment Scores (GICS sector classification)



Source: Russell Investments, Planetrics[5], Data as of 31 December 2023. Value and sector-intensity weights methodology.

Key observations from portfolio temperature alignment

- Temperature alignments generally fluctuate between 2.5 at the low end and 3.5 at the high end, implying that the rate of decarbonisation occurring is less than the modelled sector-region decarbonisation pathways required to achieve the Paris Agreement's 1.5-degree target.
- Financials, utilities, communication services, health care, and real estate are some of the best performing sectors with temperature alignments all under 3-degrees.
- Since this is the first year we are calculating temperature alignments for this portfolio, it is difficult to draw any meaningful insights other than the relative temperature alignments between sectors.

Looking forward

- While useful for providing a more sector-specific forward-looking metric, the disadvantage of temperature scores is that they have not achieved the same level of consistency and transparency as carbon emissions.
- For the time being, we continue to use carbon emission metrics as our primary reference point for target setting and progress tracking. However, we will consider temperature data as a supplementary reference point.

2c. Management of climate risks and opportunities

Management of climate-related risks and opportunities follows our RIGL global operating model. For details, please refer to the "2c. Management of climate risks and opportunities" of the Global TCFD report 2024.

Section 3: Business operations

Our business' approach to climate management is centralised in our global report, please refer to the "3. Business Operations" of the Global TCFD report 2024.

Appendix

Common portfolio carbon footprinting cheat sheet

METRIC		SUPPORTING INFORMATION
Weighted average carbon intensity **Also known as:** **WACI**	*Description*	Portfolio's exposure to carbon-intensive companies, expressed in tons CO_2e / $M revenue. *Metric recommended by the Task Force on Climate-Related Financial Disclosures (TCFD).*
	Formula	$\sum_i^n (\frac{current\ value\ of\ investment_i}{current\ portfolio\ value}\ X\ \frac{issuer's\ scope\ 1\ and\ scope\ 2\ GHG\ emissions_i}{issuer's\ \$M\ revenue_i})$
	Methodology	Scope 1 and scope 2 GHG emissions are allocated based on portfolio weights (the current value of the investment relative to the current portfolio value).
	Sovereign Equivalent	"GHG Intensity (t/USDM GDP Nominal)": The higher value, the more carbon-intense the economy is. $\sum_i^n (\frac{Exposure\ to\ Sovereign\ Bond(USD)_i}{current\ portfolio\ value}\ X\ \frac{Country\ GHG\ emissions_i}{Country\ GDP\ Nominal\ (m\ USD)_i})$
	Key points *+/-*	+ Metric can be more easily applied across asset classes since it does not rely on equity ownership approach + Generally interpreted as a more risk-oriented approach versus the later metrics, which are more related to aggregate real-world emissions and hence considered more "impact" related. + Metric allows for portfolio decomposition and attribution analysis - Metric is sensitive to outliers
Financed emissions **Also known as:** **Total Carbon Emissions (EVIC method)**	*Description*	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO_2e. *Metric recommended by the Partnership for Carbon Accounting Financials (PCAF).*
	Formula	$\sum_i^n (\frac{current\ value\ of\ investment_i}{issuer's\ EVIC_i}\ X\ issuer's\ scope\ 1\ and\ scope\ 2\ GHG\ emissions_i)$
	Methodology	Share of emissions attributable to the investor's holding in the company. If an investor holds an investment worth 5 percent of the company's total financing (enterprise value incl. cash), then 5 percent of the company's emissions are attributable to that investor. Attributable emissions in each company are summed across the portfolio. By using EVIC instead of market cap as the attribution factor, the method can be used for both equity and fixed income.
	*Sovereign Equivalent**	"GHG emissions": Share of sovereign GHG emissions attributable to the investor's share of total debt outstanding. $\sum_i^n (\frac{Exposure\ to\ Sovereign\ Bond(USD)_i}{Public\ Debt\ Outstanding\ (USD)_i}\ X\ Country\ GHG\ Emissions_i)$
	Key points *+/-*	+ Metric may be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol, generally interpreted as more impact-oriented as opposed to risk-oriented and hence is frequently used in target setting - Metric is generally not used to compare portfolios because the data is not normalised, increases in portfolio value (or AUM) will lead to increases in portfolio emissions - Changes in underlying companies' EVIC can be misinterpreted as reductions in real world emissions
Carbon footprint (EVIC method) **Also known as:** **Financed Emission Intensity**	*Description*	Total carbon emissions for a portfolio normalised by the market value of the portfolio, expressed in tons CO_2e / $M invested.
	Formula	$\frac{\sum_i^n (\frac{current\ value\ of\ investment_i}{issuer's\ EVIC_i}\ X\ issuer's\ scope\ 1\ and\ scope\ 2\ GHG\ emissions_i)}{current\ portfolio\ value\ (\$M)}$
	Methodology	Financed emissions above, standardised by portfolio value.
	Key points *+/-*	+ Metric may be used to compare portfolios to one another and/or to a benchmark - Metric does not take into account differences in the size of companies (e.g. does not consider the carbon efficiency of companies) - Changes in underlying companies' EVIC can be misinterpreted as reductions in real world emissions

Notes: the term 'portfolio' can be defined as "fund or investment strategy" for asset owners and "product or investment strategy" for asset managers. Total carbon emissions and carbon footprint can also be calculated using a company's market capitalisation instead of Enterprise Value including cash though we do not use this because it cannot be used across asset classes. PCAF has recently released new guidance on sovereign emission financed emissions and after review we may elect to change this attribution factor in the future. Sovereign "GHG Emissions per capita" are also displayed at Russell Investments for completeness, but this measure does not translate to the above standard industry uses.

Supplemental metrics

Following the UK's Department for Work and Pensions mandating TCFD-related disclosures for institutional pension schemes, a standard set of climate-related metrics are increasingly being expected by UK clients and consultants. The following metrics are part of this core template:

METRIC		SUPPORTING INFORMATION
Data Quality	*Description*	Proportion of a portfolio where there is high quality data. *Additional climate change metric recommended by the Task Force on Climate-Related Financial Disclosures (TCFD).*
	Methodology	Calculates the proportion of Scope 1-2 emissions that are verified, reported, estimated or unavailable.
	Key points +/-	+ Metric allows for a better understanding of ESG data accuracy. + More transparency into the breakdown of data quality. - Does not look into climate change analysis directly. - Estimated data coverage is subject to model risk.
Portfolio Temperature Alignment (Implied Temperature Rise)	*Description*	Metric which estimates a global temperature rise associated with the greenhouse gas emissions of a portfolio. It is a forward-looking metric that incorporates current GHG emissions, alongside other assumptions, to estimate expected future emissions. Expressed as a temperature score (e.g., 5 degrees Celsius). *Portfolio Alignment climate change metric recommended by the Task Force on Climate-Related Financial Disclosures (TCFD).*
	Formula	$Temperature\ Score_F = \frac{\sum_{i \in F} Temperature\ Score_i \times GHG\ intensity_S \times Current\ value\ of\ investment\ in\ entity_i}{\sum_{i \in F} GHG\ intensity_S \times Current\ value\ of\ investment\ in\ entity_i}$
	Methodology	Total portfolio temperature alignment is calculated as a weighted average of underlying security temperature scores using sector intensity and AUM weighting. These scores are sourced from Planetrics.
	Key points +/-	+ Forward looking and accounts for inherent differences in carbon emissions across industries and regions. + Can be compared across different benchmarks, portfolios, and asset classes. - Methodology constantly developing, and is likely to change significantly as quantitative methods are researched further - Complex and opaque regarding the influence of key assumptions.

FOR MORE INFORMATION

Visit **russellinvestments.com**

EMEA-2467