



Taskforce for Climate Related Financial Disclosure (TCFD) Report

December 2022

Ardea Global Alpha Fund [UK/EU]





At Ardea Investment Management (Ardea IM), we believe that the assets we invest in – government bonds – must retain their status as a stable and low risk asset class for investors. For this reason, the long-term sustainability of the asset class is an ongoing priority for investors. Conversely, we also believe that ignoring the impacts of climate change poses an uncertain and difficult-to-quantify risk to the funds we manage on behalf of our clients. It is therefore our fiduciary responsibility to integrate these considerations into our investment process and act responsibly and sustainably with respect to our own carbon footprint and as a fiduciary steward of client assets. Ardea IM supports the Paris Agreement and have signed the Global Investor Statement to Governments on Climate Change.

The Ardea IM 2022 TCFD Report is our first disclosure on how we manage climate risks and opportunities in our portfolios and as an organisation. While there is still a lot of work to go, we are committed to improving the way in which we integrate climate physical and transition risks in our portfolios. We also look to pursue a range of initiatives including with respect to green bond market development.



Governance

Disclose the organisation's governance around climate risks and opportunities

a. Describe the board's oversight of climate related risks

Regular ESG Board reporting has been developed for the Ardea IM Board and will be presented as part of the CEO update at each Board meeting. This Board report will provide detail on the way Ardea IM manages climate risks and opportunities across the various time horizons that are relevant to the portfolio, including the role of scenario analysis.

The Ardea IM Board has oversight over high-level firm strategy and whether appropriate risk management processes and policies are in place. This oversight extends to policies that address regulatory and fiduciary risks relating to ESG or sustainability related elements.

Improvement Opportunities

- In 2023 Ardea IM will ensure the Board receives appropriate briefing on the roles and responsibilities of Board oversight with respect to climate risks and opportunities.
- Ardea IM will also work on developing company reporting on the goals and targets for climate related risks across the portfolio, including reporting on the metrics relating to the development of the green bond market.

b. Describe management's role in assessing and managing climate related risks and opportunities

The CEO and leadership team oversee the Ardea IM ESG strategy, including the management of climate related risks and opportunities, with implementation delegated to the research and investment teams within Ardea. The ESG strategy is developed in consultation with the Ardea IM Chief Investment Officers, Ben Alexander and Gopi Karunakaran and the Ardea IM CEO Stephen Clout.

Management are kept apprised of climate developments and related issues through regular presentations by the research team on ESG issues and topics at weekly investment meetings; by regulatory updates tabled by the executive leadership team at board meetings; and by broader industry advice and guidance from external advisors including the company's distribution partner, Fidante.

Strategy

Disclose the actual and potential impacts of climate related risks and opportunities on the organisation's businesses, strategy and financial planning where such information is material.

a. Describe the climate related risks and opportunities the organisation has identified over the short, medium and long term

Opportunities

Green bond market development

Development of the green bond market is focused on the goal of creating a deeper, more liquid green bond market. Liquidity is a fundamental property of government fixed income and performs a crucial role in investor portfolios. For this reason, it is important that growth in the green bond market delivers not just increased issuance, but also liquidity that is at least as favourable as that available on conventional government bonds. This is necessary to ensure that growth in the green bond market, which has a strong buy-and-hold focus from most investors, does not produce a reduction in liquidity in the asset class. By specifically targeting green bond turnover and liquidity, as distinct from focusing only on issuance, the company aims to ensure that investors can continue to benefit from the highly liquid status that the government fixed income sector has historically enjoyed.

Climate change policy

The firm's focus on climate change policy is to shape and influence government policy with respect to ESG and climate risk at a national and state level. Effective policy in these areas has the potential to materially improve key outcomes such as the level of economic growth and its variability, as well as lowering inflation risks. Progress in these areas contributes directly to a higher structural rate of return on government fixed income. Our influence on these policies is likely to be strongest in an Australian context but may be accessible in other markets.

Policies to support fiscal strength and resilience

Through identifying key funding areas that support long-term fiscal strength and economic growth, the firm aims to ensure that clients' capital is allocated in ways that support long-term stability and stewardship of the asset class. Such measures may relate to addressing funding gaps in areas where policy failures are especially costly for government finances. This includes funding for social housing and for education and health outcomes, all of which are demonstrated to greatly lower government costs over the long-term and thus boost fiscal strength. Our influence in this area is likely to be strongest in those markets where the business has a physical presence and staff on the ground (UK and Australia) but may be accessible in other markets.

Given the homogeneous nature of government bond risk, improvements in policy outcomes that lead to increased fiscal resilience may not produce distinct investable opportunities, unlike those available in other fixed income sectors or other asset classes. However policy improvements also provide a rising tide that lifts all boats, and from this perspective the opportunity is one that benefits the entire sector. This is a more powerful outcome than the narrowly targeted risks or opportunities that are limited to specific companies or sectors and are typical outside of the sovereign fixed income category.

Sectors and geographies

In terms of sectors, within Australia the greatest opportunity currently lies in the successful development of a sovereign green bond market. This reflects the fact that the Australian state issuers have, to varying degrees, already commenced green bond issuance whereas the core sovereign issuer in Australia has yet to do so.

In terms of geographies within Australia, differing regions face a different set of opportunities given wide variation in physical and transition risks from climate change. Regions with heavy reliance on natural resources exports have greater scope to deliver higher targets and larger year on year deltas needed to offset higher emissions activity or higher fossil fuel reliance. Opportunities to shape or fund the transition will likely be greater in these regions.

In contrast, regions with heavy exposure to physical risk pose greater opportunities for remediation. This includes regions with increased frequency of flooding, fires, and other natural disasters, regions with increased financial exposures arising from low-lying coastal property values, and regions with greater reliance on natural capital and biodiversity as a means of tourism revenue. Opportunities to lower physical risk through guiding and supporting effective policy are likely greater in these regions. This creates a stronger focus on engagement activity in driving outcomes in these areas.

Transition Risk

Many in the investing community claim that climate change is not being factored into government bond markets and therefore sovereign bond yields are not fully reflecting the impact of climate change and a country's effort to transition to a low-carbon economy in line with the 2015 Paris Agreement. We challenge this narrative as part of a joint study with UTS ([link to paper](#)) and find climate transition risk is priced into government bond markets.

Physical Risk

Physical risks: risks over the medium to longer term on the credit ratings of Governments by ratings agencies from the physical impacts of more frequent natural disasters.

b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

The management of climate risks and opportunities is fully integrated into the ESG integration investment process and is considered as an ESG risk factor. The potential impact of climate related risks and opportunities is a factor driving the research strategy, one of the three pillars of the Ardea IM ESG Policy. This has resulted in the development of several key research partnerships with academic institutions including the University of Technology Sydney publishing a paper 'Climate change transition risks on sovereign bond markets.'

The business also recognises that its ongoing existence rests entirely on the availability of a well-functioning market for government bonds. Without such a market, the case for allocating to fixed income does not exist, and moreover pricing of a wide range of other financial assets is potentially thrown into turmoil. For this reason, the business views its ongoing role in supporting bond market development as being critical to the organisation's overall strategy and business planning. This includes through the company's liaison activities with issuers and its education and advocacy with other stakeholders, including investors, consultants, academia, the media, and others, Initiatives that support these objectives are therefore given full priority and resourcing by the business.

c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario

We use the risks identified in our research paper with UTS (link to paper) that finds that climate transition risk is priced into government bond markets. We use these risks as the basis for our scenario analysis, and to inform our other policies (in particular our policy regarding participation in the green and "brown" bond markets).

To understand how climate change risk impacts government bond yields we fit the following model:

Equation (1) specifies the dependent variable as the 10-year government bond yield, $Y_{i,t}$, for the i th country, $i \in \{1, \dots, N\}$ and time, $t \in \{1, \dots, T\}$,

$$Y_{i,t} = \gamma_1 CO2_{i,t-1} + \gamma_2 Rent_{i,t-1} + \gamma_3 Renewables_{i,t-1} + \beta_1 GDP_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Inflation_{i,t} + \beta_4 Debt_{i,t} + \beta_5 Trade_{i,t} + \beta_6 Current_{i,t} + \beta_7 rating_{i,t} + \mu_i + \nu_t + \epsilon_{i,t}, \quad (1)$$

where the collection of transition risk variables are: carbon dioxide emissions, $CO2_{i,t-1}$; natural resources rents, $Rent_{i,t-1}$; and renewable energy consumption, $Renewables_{i,t-1}$. The control variables are: GDP per capita, $GDP_{i,t}$; real GDP growth, $Growth_{i,t}$; inflation rate, $Inflation_{i,t}$; debt-to-GDP ratio, $Debt_{i,t}$; trade openness, $Trade_{i,t}$; the current account to GDP ratio, $Current_{i,t}$ and the Moody's sovereign credit rating, $rating_{i,t}$. The μ_i are the country-specific intercepts that capture heterogeneity's across countries. The ν_t are the yearly-specific intercepts that capture heterogeneity's across the years. $\epsilon_{i,t}$ are the idiosyncratic error terms.

Physical risks are missing from the expression above. The proxies used to measure physical risk (e.g., the NDGAIN

Country Index¹) are slow moving and do not exhibit enough volatility to map to movements in yields.

However, the physical risk of climate change is currently impacting GDP levels globally. The Australian example is a case in point: "The economic implications are profound," the Australian Reserve Bank governor told the Australia-Canada Economic Leadership Forum, February 2020. "The world is getting hotter and the climate's more variable, and we're seeing already in Australia, perhaps more than anywhere else in the world, the effects of that."². This means that even if investors are not making the explicit link between the decline in current levels of GDP to the physical risk of climate change, climate change is being priced into government bond yields as a result of investors accounting for concurrent GDP levels.

Given the range of scenarios over which climate change might be realised, there is inherently a degree of uncertainty for the business in whether investors can continue to be adequately protected against these risks, and therefore whether the business can continue to operate its funds management services. As these risks are existential for investors and for the business, considerable resources have been allocated from the research team and from across the business towards addressing and mitigating these risks. While we cannot have absolute certainty that the business and its investors will be resilient to all risks across all scenarios, we seek to lower these risks wherever possible.

Table 1: Sovereign Bond Yields/Spreads and their relationship to Climate Change Transition Risk - Advanced Countries

The table reports the estimation results of the panel fixed effects regressions (1) and (2) between the sovereign bond yields and spreads, respectively, and the climate change transition indicators for the group of the developing countries. Country fixed effects and year fixed effects have been used in all regressions. Standard errors are displayed in parentheses; $p < 0.1^*$, $p < 0.05^{**}$, $p < 0.01^{***}$.

Dependent variable	Sovereign bond yields				Advanced countries				Sovereign bond yield spreads			
	1	2	3	4	1	2	3	4	1	2	3	4
Carbon dioxide emissions	0.211** (0.089)	0.280*** (0.071)			0.269** (0.114)	0.308*** (0.085)			0.269** (0.114)	0.308*** (0.085)		
Natural resources rents	0.540** (0.250)		0.725*** (0.257)		1.161*** (0.260)		1.326*** (0.260)		1.161*** (0.260)		1.326*** (0.260)	
Renewable energy consumption	-0.063* (0.037)			-0.116*** (0.030)	-0.010 (0.040)				-0.010 (0.040)			-0.090*** (0.031)
GDP per capita	-4.937*** (0.416)	-5.496*** (0.324)	-5.500*** (0.350)	-5.4862*** (0.389)	-1.982*** (0.431)	-2.267*** (0.431)	-2.265*** (0.357)	-1.756*** (0.408)	-1.982*** (0.431)	-2.267*** (0.431)	-2.265*** (0.357)	-1.756*** (0.408)
Real GDP growth	-0.059*** (0.023)	-0.064** (0.022)	-0.054** (0.023)	-0.058** (0.023)	-0.117*** (0.023)	-0.126*** (0.024)	-0.113*** (0.024)	-0.117*** (0.024)	-0.117*** (0.023)	-0.126*** (0.024)	-0.113*** (0.024)	-0.117*** (0.024)
Inflation	0.127*** (0.044)	0.144*** (0.043)	0.130*** (0.044)	0.127*** (0.043)	0.260*** (0.045)	0.281*** (0.045)	0.253*** (0.045)	0.271*** (0.045)	0.260*** (0.045)	0.281*** (0.045)	0.253*** (0.045)	0.271*** (0.045)
Debt-to-GDP	0.007 (0.005)	0.007 (0.005)	0.001 (0.005)	0.004 (0.004)	0.024*** (0.005)	0.023*** (0.005)	0.019*** (0.005)	0.021*** (0.005)	0.024*** (0.005)	0.023*** (0.005)	0.019*** (0.005)	0.021*** (0.005)
Trade openness	-1.023 (0.663)	-0.889 (0.631)	-1.027 (0.674)	-0.688 (0.633)	-0.912 (0.684)	-0.585 (0.670)	-0.910 (0.693)	-0.551 (0.674)	-0.912 (0.684)	-0.585 (0.670)	-0.910 (0.693)	-0.551 (0.674)
Current account balance	0.003 (0.023)	-0.011 (0.021)	-0.022 (0.023)	0.004 (0.021)	-0.029 (0.024)	-0.029 (0.022)	-0.047 (0.023)	-0.012 (0.022)	-0.029 (0.024)	-0.029 (0.022)	-0.047 (0.023)	-0.012 (0.022)
Credit rating	-0.215*** (0.046)	-0.160*** (0.041)	-0.168*** (0.044)	-0.225*** (0.045)	-0.237*** (0.047)	-0.204*** (0.045)	-0.192*** (0.045)	-0.245*** (0.047)	-0.237*** (0.047)	-0.204*** (0.045)	-0.192*** (0.045)	-0.245*** (0.047)
R ²	0.613	0.644	0.598	0.638	0.396	0.372	0.373	0.367	0.396	0.372	0.373	0.367
Adj. R ²	0.577	0.615	0.564	0.609	0.339	0.321	0.319	0.314	0.339	0.321	0.319	0.314

Table 1 shows the parameter estimates for Equation 1. For developed markets we see there is a positive relationship between yields for carbon dioxide emissions. These results inform our scenario analysis policy, and in part our green bond market policy as explained below.

As guided by APRA³ in CPG 229 we incorporate the following considerations into our scenario analysis:

1 <https://gain.nd.edu/our-work/country-index/>
 2 <https://www.bloomberg.com/news/articles/2020-02-13/rba-s-low-e-says-economic-implications-of-climate-change-profound>
 3 <https://www.apra.gov.au/consultation-on-draft-prudential-practice-guide-on-climate-change-financial-risks>



Future Temperature Rises

- global average temperatures continuing to rise in the absence of mitigating actions and policies
- limiting global average temperature increase to well below 2°C by 2100, consistent with the Paris Agreement, reducing the magnitude of longer term physical risks;

• Economic Transition Pathway

- an orderly transition to a lower-emissions economy, with policies and activities to address climate change being introduced early and gradually becoming more stringent, minimising both physical and transition risks; and
- a disorderly transition to a lower-emissions economy, with delayed action to reduce emissions leading to an increase in acute transition risks.

We undertake the following scenario testing which encompass the considerations above and is defined by the IPCC its fifth assessment report⁴:

The Paris Agreement	Average global temperature rise will remain below 2°C by 2100 Emissions stay constant
Intermediate Scenario	Emissions in the atmosphere peak at around 2040 and then decline. Global temperatures will rise by between 1.7–3.2°C by 2100 <ul style="list-style-type: none"> • Emission increase by say 0.5% per year
No Action	According to the IPCC, global temperatures will rise by between 3.2–5.4°C between the years 2081–2100 from pre-industrial times <ul style="list-style-type: none"> • Emissions increase by say 1% per year

Table 2: Shocks to yields at various horizons for different climate scenarios

Horizon	1 Year		5 Years		10 Years	
	Shock to carbon dioxide emissions over the next year (%)	Change in 10 Year Yields Over the next year (bp)	Shock to carbon dioxide emissions over the next 5 years (%)	Change in 10 Year Yields Over the next 5 years	Shock to carbon dioxide emissions over the next 10 years (%)	Change in 10 Year Yields Over the next 10 years (bp)
The Paris Agreement	None	No change	None	No change	None	No change
Intermediate Scenario	+0.5	+10.55	+2.5	+52.75	+5	+105.5
No Action	+1%	+21.11	+5	+105.5	+10	+211

We then apply the shocks above to our portfolios daily. The resulting PnL is visualised in Tableau (our data visualisation tool) and reviewed as part of our investment process. If vulnerabilities are indicated, the Optimisation team is tasked with adjusting the portfolios accordingly.

4 <https://www.swissre.com/dam/jcr:e73ee7c3-7f83-4c17-a2b8-8ef23a8d3312/swiss-re-institute-expertise-publication-economics-of-climate-change.pdf>



Risk Management

Disclose how the organisation identifies, assesses, and manages climate related risks

a. Describe the organization's processes for identifying and assessing climate-related risk

The Ardea IM ESG Framework is based on three key pillars: research, integration and engagement. Through the research and integration pillars, Ardea IM is able to identify and assess climate related risks in the portfolio.

Risks and opportunities are identified via research (in house in conjunction with academic institutions, the literature, research houses and ratings agencies). Investment ideas and climate related risks are discussed at our weekly risk and strategy meetings.

Ardea IM examine key transition risk factors in the portfolio that are relevant to Government bonds including:

- Carbon emissions
- Renewable energy consumption
- Resource rents

A key part of identifying and assessing climate related risks and opportunities is through engagement with issuers. The objectives of engagement are first to assist with gathering information that better supports and enhances the assessment of climate related risks and opportunities. This is undertaken through ongoing liaison with issuers aimed at communicating strong support from investors for improvements in disclosure and reporting, and through providing feedback in areas where improvements may be needed.

The second objective of engagement is to ensure changes in practice across the full scope of responsibilities held by issuers. This includes not just with respect to policy changes related to the issuance of government bonds and associated climate risks and opportunities, but also the wider set of policy decisions made by governments. These will often have far greater bearing on climate outcomes than decisions made within the discretion of the issuer itself and thus are the key focus of engagement efforts.

b. Describe the organization's processes for identifying and assessing climate-related risk

The business accepts that by investing in government bonds on behalf of its clients, it incurs material exposure to climate change risks as well as potential upside from opportunities arising from climate change. In incurring these risks, the business recognises that the government bond market differs considerably from private sector capital markets in that government bonds represent an asset class for which there are no real substitutes. Moreover, in addition to the unique properties of the asset class, many investors in the sector hold government bonds not just because of their risk and return properties, but also because of stringent regulatory or prudential requirements. Together, these attributes mean that imposing market discipline as a means of managing and ultimately reducing climate related risks is of only limited effectiveness.

We monitor climate change risk through the scenario analysis outlined in the Strategy disclosure above. This allows us to monitor the likely impact of different climate scenarios, including physical and transition risks.

Given this backdrop, the business accepts that it will incur material climate related risks in investing funds on behalf of clients and as such the business has devoted considerable effort in undertaking research to measure and assess these risks (refer above).

c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management

The focus to date has been identifying climate related risk through the research and ESG integration process. The next step is to integrate the risks into the enterprise risk management framework. Ardea IM plan to incorporate climate risk in the risk management framework in 2023. As this process is completed this will ensure that climate related risks are assessed in the same way that all other business risks are assessed, and benefit from existing established processes and frameworks for assessing these risks.

Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate related risks and opportunities where such information is material

a. Disclose the metrics used by the organization to assess climate related risks and opportunities in line with its strategy and risk management process

Metrics and targets used by the business to assess climate related risks and opportunities are spread across three broad areas:

1. Research to identify the sensitivity of government bond yields to key climate change metrics. These are discussed in detail in earlier sections and provide a foundational framework for assessing the broad climate-related risks accruing to the government fixed income sector as a whole.
2. Scenario analysis and stress testing investment portfolios according to IPCC climate change scenarios and associated changes in government bond yields across the forward horizon. This process provides an accurate, market-based measure of investors' exposure to climate change and is measured at the portfolio level to accurately account for changes in investment holdings through time and for changes in correlations and relationships between securities within an investment portfolio.
3. Carbon intensity and emissions reporting consistent with regulatory requirements and standards. These measurements provide a standardised means of reflecting climate change exposures that is intended to be universal across different sectors and thus allows investors to perform aggregate portfolio analysis to determine their overall exposure to climate related risks, including all assets held.

Because sovereign government bonds pose some unique differences with other asset classes, such as the absence of equity market capitalisation and no direct parallel to private sector measures such as revenue or profit, several adjustments have been made to calculate appropriate carbon intensity and emissions exposures across portfolios. The starting point for the TCFD calculations provided below are the methods defined in the 2021 TCFD Annex in Table 3 on page 52, and available on the TCFD website: <https://www.fsb-tcdf.org/publications/#implementing-guidance>

The main variation in implementing these measures for a government bond portfolio is the use of country-level GDP in place of corporate issuer revenue, and country sovereign bond market capitalisation in place of corporate issuer market capitalisation. Some figures are also scaled

by GDP in US dollars to allow for comparability and aggregation at the total portfolio level. Emissions data are sourced from EDGAR, as availability of scope 1 and 2 emissions at the country level remains unclear.

Figures for portfolio data are for the stated reporting period whereas other data including emissions, GDP, and market capitalisation, are most recent available which in some cases will be for an earlier period.





b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks

Ardea Global Alpha Fund

Weighted average carbon intensity	104.20 t CO ₂ yr/\$USm This figure represents the emissions of the portfolio weighted according to country allocation, with emissions scaled by GDP to normalise large nations relative to smaller ones.
Total Carbon Emissions	36,000.69 t CO ₂ yr This is calculated at the security level then aggregated for the portfolio. This is the portfolio's actual annual emissions based on its share of total government borrowing.
Carbon Footprint	148.43 t CO ₂ yr/\$USm This is the total carbon emissions measure from above, but divided by portfolio value to produce emissions per million US dollars invested.
Carbon Intensity	92.44 t CO ₂ yr/\$USm

NOTE: More detail on each of these measures is provided in the TCFD Annex available at <https://www.fsb-tcf.org>.

The total carbon emissions measure should be scaled pro-rata by the size of a client's investment in the fund. Other metrics are already per million USD so do not require scaling.

These are strictly indicative estimates given the extensive assumptions Ardea IM have made.

c. Describe the targets used by the organisation to manage climate related risks and opportunities and performance against targets

Ardea IM is yet to set targets to manage climate related risks and opportunities. Through the ESG integration framework, the focus to date has been assessing the

physical and transition risks in the portfolio, scenario analysis and the impact to Government bonds.

As we further develop our strategy to grow the green bond market, we may have more access to data to enable us to set a target. This is an area the Ardea IM management team will continue to review as more research and data develops in this asset class.

