Invesco

Climate risk

10 numbers you need to know

01

Footing a US$500 billion bill: what is climate risk?

The world is under immense strain from resource depletion, pollutants and the threat of widespread disruption to every aspect of day-to-day life. The evidence is plain to see, but how can we collectively begin to tackle the economic and social impacts?

Defining climate risk is the first step and, from there, investors can begin to consider the environmental, social and governance (ESG) factors associated with climate change. Climate risk can be broadly separated into two areas:

1. Physical Risk

2. Transition Risk (towards a cleaner economy) **(Figure 1).**

It can be difficult to predict the full cost of physical risks to the global economy, but research has suggested climate disasters between 2016 and 2018 cost in the region of US$650 billion[1]. Meanwhile, according to the United Nations Research Programme, the costs of adaptation and transitioning to a cleaner economy could range from US$140 billion to US$300 billion by 2030, and between US$280 billion and US$500 billion by 2050[2].

Impacts of physical risk are not evenly distributed throughout the world and it is less developed nations that typically bear the brunt. Equatorial regions make up 40% of global GDP but 85% of the world's population[3]. Rising sea levels, inhospitable conditions and falling crop yields could all lead to mass migrations.

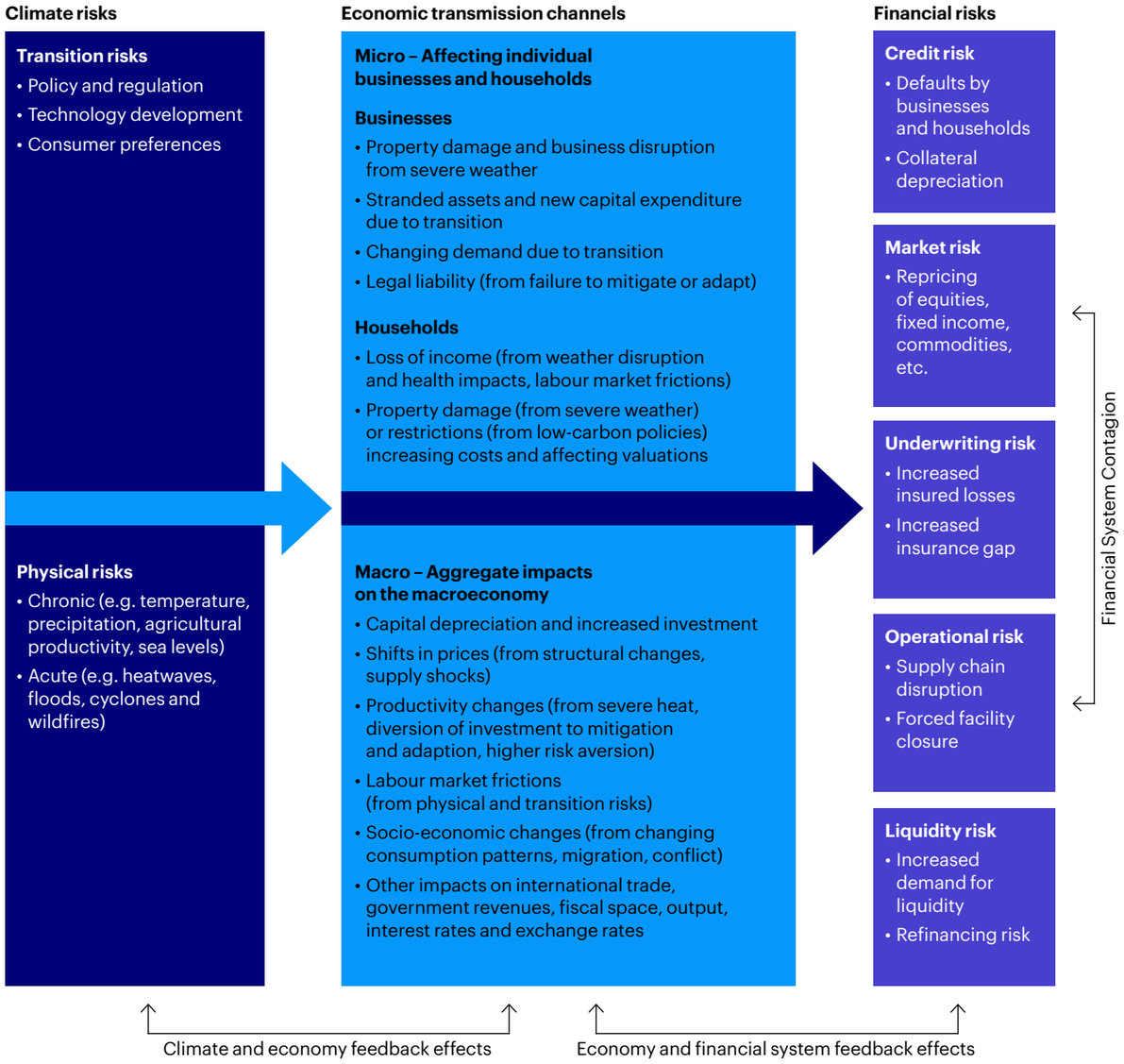
There is also likely to be a discrepancy between preparedness and susceptibility when it comes to these risks. For example, wealthier countries such as Emirati states have the resources to prepare for, and tackle, physical risks like water shortages in a more effective way than poorer equatorial nations.

As with physical risks, transitional risks pose issues for economies with a heavy reliance on certain sectors and could impact less economically developed countries. The more robust economies of a country like China, should be able to more effectively adapt to increased levies on carbon emissions than Venezuela. Similarly, lower crop yields due to arid conditions or lost labour hours as a result of heat could have a dramatic effect on commodity prices in years to come which will hit developing nations without a varied economic output.

For investors, physical and transitional risks caused by climate change and resource shortages will lead to unpredictable market conditions. This volatility could hit returns but may also lead to increasing discrepancies and mispricing in a variety of asset classes including sovereign bonds.

1 Climate disasters cost $650 billion over 3 years: Morgan Stanley (cnbc.com), Accessed 2021
2 Puig, D., Olhoff, A., Bee, S., Dickson, B., & Alverson, K. (Eds.) (2016). The Adaptation Finance Gap Report. United Nations Environment Programme.
3 IMF and UN Population Fund.

Figure 1
Climate Risk Drivers



Source: TCFD: Recommendations of the Task Force on Climate-related Financial Disclosures, 2017.

02

USD$55 for carbon

The price of carbon is a key barometer in the fight against climate change as polluting industries are disproportionately impacted. The price is set by the governments or markets and CO2 emitters are charged for each ton produced via a tax or a fee.

The EU carbon market is a key pillar of the bloc's attempt to cut emissions and reach net zero targets by 2030. Since November 2020, the price of carbon in Europe's market has more than doubled to US$55 per tonne with the expectation of further increases. In fact, according to the World Bank, 64 carbon pricing instruments are now in operation around the world which covers 20% of global greenhouse gas emissions and generates US$53 billion in revenue.

However, the majority of carbon prices remain far below the US$40-80/t$CO_2$e range needed to meet the 'well below 2°C' temperature goal of the 2015 Paris Agreement. At this point, carbon prices in the recommended range cover less than 5% of global emissions[5].

As discussed in a recent Invesco webinar, any increase to the carbon price could cause 'supply side shocks' as higher business costs lead to inflationary pressure with investors baulking at the rising cost of services and seeking cheaper alternatives. Though lower emissions provide undoubted benefits for the world around us, it creates a problem for economies reliant on the export of high carbon emitting products and services.

From a global trade perspective, efforts may need to be made to avoid European businesses feeling disadvantaged by disproportionately stringent carbon taxes when compared to China and the US. It seems likely that regulation will increase, with the possibility of higher cost bases for companies.

[4] World's Biggest Carbon Market to Get Stronger in EU Green Shift - Bloomberg.
[5] Carbon Prices now Apply to Over a Fifth of Global Greenhouse Gases (worldbank org).
[6] As discussed in a recent Invesco webinar (Can ESG drive a New World Order?)

03

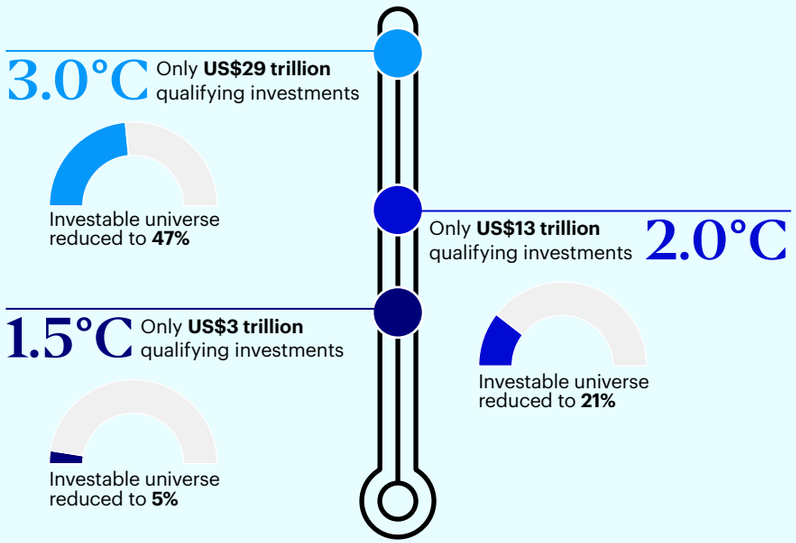
95% of the market incompatible with a 1.5°C increase in global temperatures

As part of the 2015 Paris climate agreement, governments made progress towards initiatives designed to tackle climate change. Without any action, the world was on course for a global temperature increase of four degrees by the end of this century. However, the current policies of global governments put the world on track for a 3°C temperature increase by 2100[7].

This doesn't yet go far enough to meet the 2°C target set out at the summit. Many investors believe that even more stringent policies need to be in place, and would prefer to align themselves to investments with carbon emissions that would limit the increase to 1.5°C.

This poses a problem. The sluggish rate of change from governments and companies means that investors who wish to build a portfolio of qualifying investments compatible with the 1.5°C increase face a narrow pool of choices as shown in **Figure 2**. Will investors accept that they are effectively missing out on a broader selection of investments or will they begin to exert pressure on those which aren't compliant?

Figure 2
Qualifying Investments by temperature increase[8]



7 UN emissions report: World on course for more than 3 degree spike, even if climate commitments are met | | UN News
8 Climate Reality Bites: Actually, We Will Not Always Have Paris - MSCI.

04

By 2030, 85% of world's emissions will be produced by just 20 nations

2021 promises to be a key year for international efforts to tackle climate change as the COP26 conference takes place in Glasgow and will act as an opportunity to assess progress made against current targets.

According to the UN Environment Programme, emissions must fall by 7.6% annually to restrict the worldwide temperature rise this century to less than 1.5°C above pre-industrial levels.[9]

There is increasing urgency as central bankers and governments have already warned of a 'Minsky moment' in which asset classes collapse due to climate change. To try and avoid these challenges and widespread disruption, 34 central banks and supervisors – representing five continents, half of global greenhouse gas emissions and the supervision of two-thirds of major global banks and insurers – joined forces in 2017 to create a coalition of the willing: the Network for Greening the Financial System (NGFS).

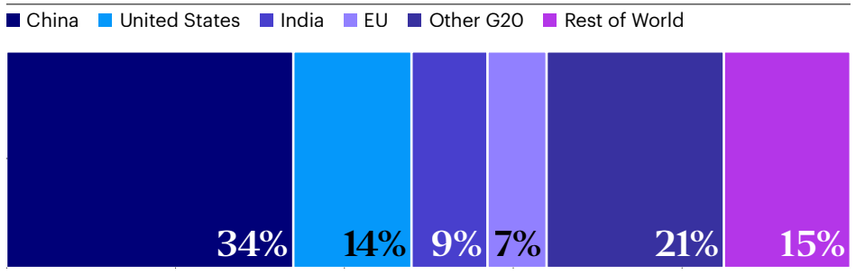
This group is looking to make policy recommendations and exert pressure on unsustainable countries and businesses.

60 countries have committed to being carbon neutral by mid-century. Importantly, China has committed to 2060 in a move which surprised many and, as the world's biggest emitter, its response will be key to the success or otherwise of wider global efforts.

Figure 3 shows the need to consolidate global efforts of central banks and governments as, by 2030, China, India, the US and the EU will account for nearly two-thirds of projected global CO_2 emissions if current policies continue. Including the full G20 takes this figure to 85% and strengthening global policies between these nations will hold them to account.[10]

9 Facts about the Climate Emergency | UNEP - UN Environment Programme
10 Facts about the Climate Emergency | UNEP - UN Environment Programme

Figure 3
Projecting the world's biggest emitters[11]



Source: IMF calculations. Note: Baseline refers to projected emisions with no new, or tightening of existing, mitigation policy. EU = European Union; G20 = Group of Twenty.
11 Facts about the Climate Emergency | UNEP - UN Environment Programme

05

Just 5% of stocks contribute 75% of global market emissions

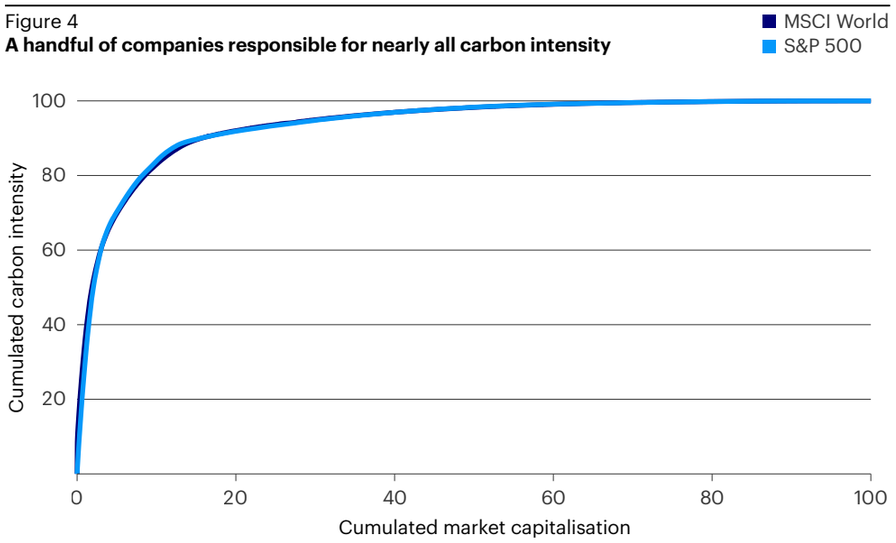
One of the challenges for investors is that carbon intensity, defined as carbon emissions per unit of output, is not equally distributed across the stock universe. Rather, it is concentrated in a minority of high-emitting companies and sectors.

This is illustrated by **Figure 4**, which plots cumulative carbon emission intensity when sorting companies from high to low carbon intensity. The steepness in the beginning, as well as the flatness in the end, implies a very tilted distribution towards a few major contributors. Indeed, about 5% of stocks by market capitalisation account for 75% of total S&P 500 Index carbon emissions. The distribution looks almost identical for the MSCI World Index.

Figure 5 shows the carbon intensity of different sectors in the S&P 500 Index, which is heavily tilted towards certain industries. The utilities sector contributes 49% to the total carbon emissions while accounting for only 2.7% of the market capitalisation. When adding in the materials, industrials and energy sectors, 73.8% of the carbon exposure in the index can be attributed to sectors accounting for only 8.2% of market capitalisation.

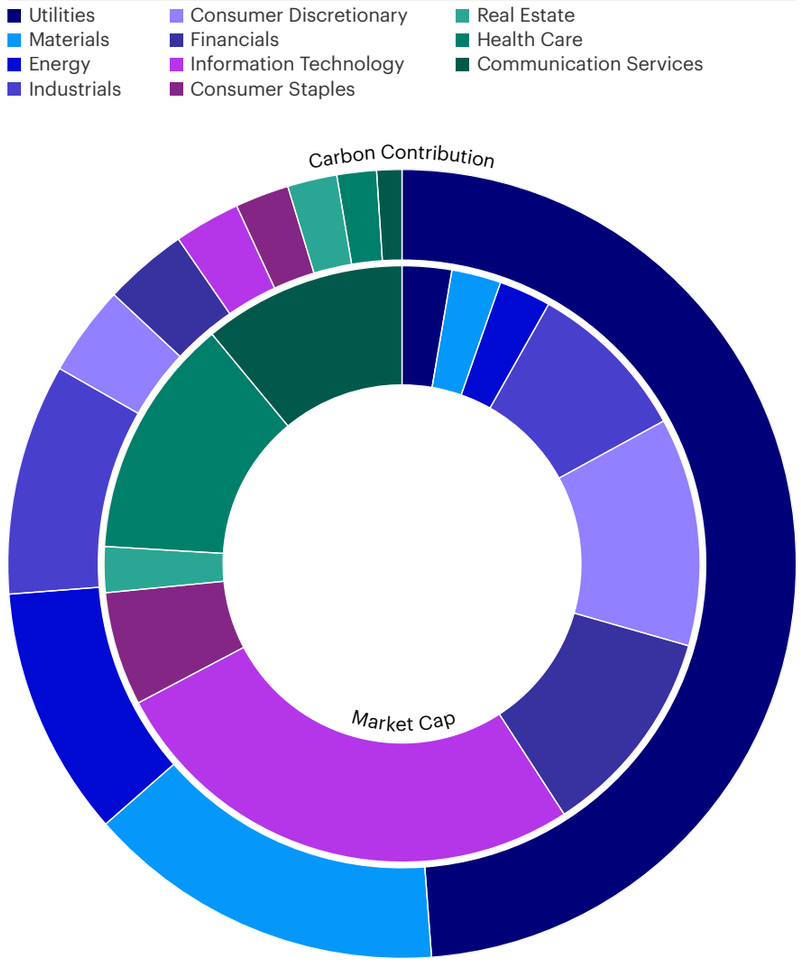
This indicates that investors looking to reduce their carbon footprint should carefully monitor sector risk or take steps to mitigate it. Divestment from those sectors is one option but there may be transitional opportunities presented due to the scale of change required. Many of these high-polluting sectors are more defensive which also poses a problem when looking to create a balanced portfolio.

Figure 4
A handful of companies responsible for nearly all carbon intensity



Source: MSCI, S&P, ISS Ethix; as at 31 March 2021, using 2019 emissions data.

Figure 5
Carbon intensity is heavily tilted to a few sectors
Sector contributions to S&P 500 carbon intensity



Source: S&P, ISS Ethix; as at 31 March 2021, using 2019 emissions data.

73.8%
of the carbon exposure in the index can be attributed to sectors accounting for only
8.2%
of market capitalization.

06

EUR1.2 trillion invested in European ESG funds

Morningstar research has shown that close to six out of 10 sustainable funds delivered higher returns than equivalent conventional funds from 2010-2020. Based on 745 Europe-based sustainable funds, the research demonstrated that the majority of strategies have done better than non-ESG funds over one, three, five and ten years.[12]

Sustainable funds also invest in companies that rise to environmental challenges and treat their stakeholders well. In other words, these tend to be quality companies that hold up better than their lower-quality counterparts in difficult market environments.[13]

Unsurprisingly, at a company level, the story is also positive and data from MSCI found that in the seven years leading up to 2020, the top third of companies ranked by ESG ratings outperformed the bottom third by 2.56% per year[14]. It perhaps comes as no surprise that ESG funds saw their assets increasing by 37.1% in 2020 to reach EUR 1.2 trillion at end-December in Europe, according to the European Fund and Asset Management Association (EFAMA)[15].

Clearly, different methodologies require examination, but the broad picture is positive and shows the appetite from investors for strategies which support the mitigation of climate risk and incorporation of environmental, social and governance factors.

6 out of 10
sustainable funds
delivered higher returns than equivalent conventional funds from 2010-2020.

[12] Do Sustainable Funds Beat their Rivals? | Morningstar.
[13] Covid-19: Why the 'S' in ESG matters (invesco.com).
[14] MSCI ESG Research LLC, 2021 ESG Trends to Watch.
[15] ESG investing in the UCITS market: a powerful and inexorable trend | EFAMA.

07

65 million jobs: the transitional opportunity

Opportunity knocks when it comes to the disruptive industries that will take centre stage as part of the transition to a climate friendly economy. One estimate found that for every US$1 million invested in renewables infrastructure or energy efficiency over 7.5 full-time jobs are created – this compares with only 2.65 in fossil-fuel infrastructure.[16]

These findings on the scale of the opportunity are supported by the Global Commission on the Economy and Climate, which concluded that transitioning to a low-carbon, sustainable growth path could deliver a direct economic windfall of US$26 trillion and create over 65 million new jobs by 2030 compared with business-as-usual.[17]

A clear example of a new and disruptive industry is shown by the growth in electric car sales with more than 10.8 million now on the roads. Analysis indicates that in 2020 there were around 3.24 million global sales of both battery-electric vehicles (BEV) and plug-in hybrid vehicles (PHEV). That's compared to 2.26 million in 2019.

In Europe, it was a real success story for BEVs and PHEVs. While the car market was suffering thanks to Covid-19, with a 20% downturn from the previous year, sales of BEVs and PHEVs were soaring with an increase of 137% from 2019.[18]

European countries are at different stages of their transition towards embracing new technology and electric car sales in certain countries, like Norway, now outstrip non-electric. This is partly due to tax benefits, which act as incentives in a high tax country, but also a mindset geared towards greener industries. Indeed, this can be seen elsewhere in the economy as state owned energy company 'Statoil', which has 20,000 employees, rebranded to 'Equinor' in 2018 and is heavily pursuing renewable alternatives.

US$1m
invested in renewables infrastructure or energy efficiency creates
7.5
full-time jobs

[16] Climate economics - costs and benefits | Energy & Climate Intelligence Unit (eciu.net).
[17] NCE 2018 (newclimateeconomy.report).
[18] There are now more than 10 million electric vehicles on the road - Zap-Map.

08

1.2% - what a disorderly transition might cost a portfolio

Invesco has adopted the climate scenarios developed by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). First published in June 2020, these aim to provide a common starting point for the financial sector to analyse climate risks. The findings below show what would happen if the scenarios in **Figure 6** were applied to the entirety of Invesco's equity, sovereign bond and corporate bond holdings as at 31 March 2021.

Figure 6
NGFS scenarios

Hot House World
This scenario assumes emissions continue to intensify until 2080, leading to a temperature increase of above 3°C and severe physical risks e.g rising sea levels. Physical risks are highest in this scenario.

Orderly
This scenario assumes climate policies are introduced early and gradually become more stringent, leading to a temperature increase below 2°C. Physical risks are smaller than in the Hot House World scenario, but transition impacts are larger.

Disorderly
This scenario assumes the same overall temperature increase as the Orderly scenario, but it also assumes climate policies are not introduced until 2030 – after which a sharp reduction in emissions is required to meet the temperature target of below 2°C. This leads to higher transition risk.

We have used a forward-looking, scenario-based model with data mapped until 2050 to simulate the impact of an array of physical and transition risks on Invesco's holdings across global equities, corporate bonds and sovereign bonds for each of the three NGFS scenarios. This led to some significant insights but it should be noted that forecasts are not reliable indicators of future performance:

- Valuation impacts are largest in the Disorderly scenario.
- Equities are the most strongly affected asset class in all three scenarios.
- For equities and corporate bonds there can be large differences in impacts which is largely due to them holding companies within highly exposed sectors.
- Sovereign bond valuations experience a mix of positive and negative impacts across scenarios

In line with Invesco's earlier work in this field, our modelling indicates valuation impacts are largest in the Orderly and Disorderly scenarios – where transition risks are greatest. Impacts in the Hot House World scenario, which arise from physical risks, are smaller. Overall, it is clear that, from an investor perspective, there may need to be a reframing of return expectations in light of heightened risks attached to listed assets and the possibility of a less dependable income.

Figure 7
Change in valuation of overall portfolio (global equities, corporate bonds and sovereign bonds) holdings relative to baseline (%)

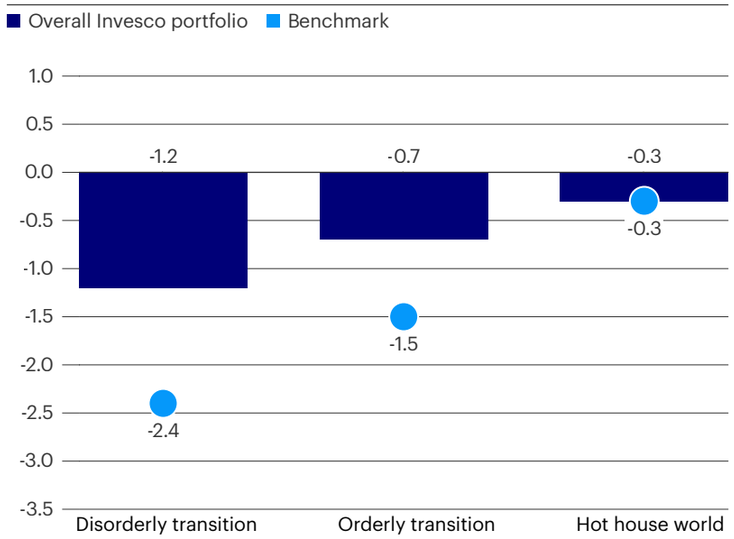


Figure 8
Change in valuation of Invesco global equity holdings relative to baseline (%)

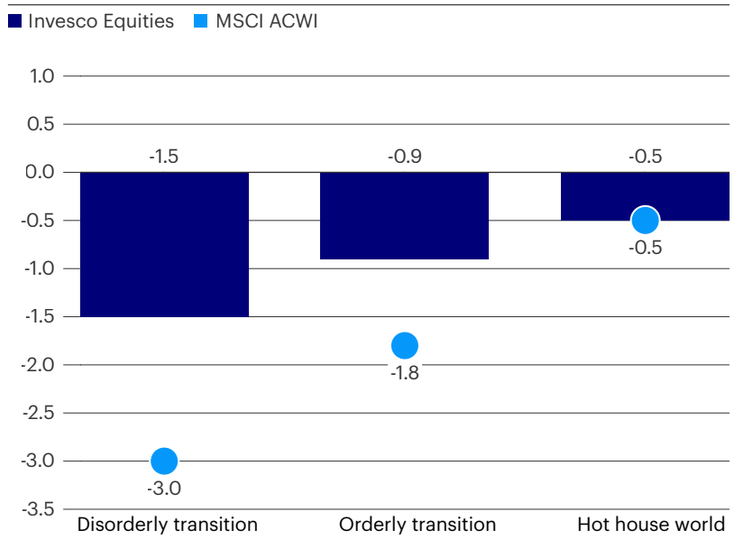


Figure 9
Change in valuation of Invesco corporate bond holdings relative to baseline (%)

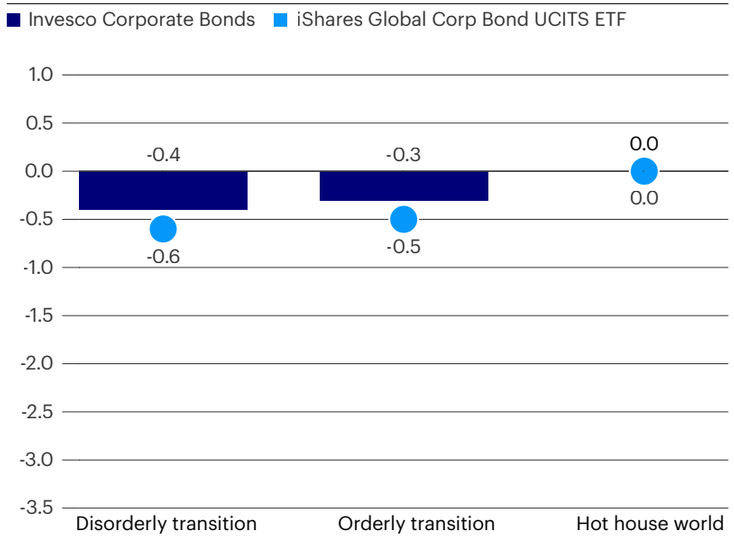
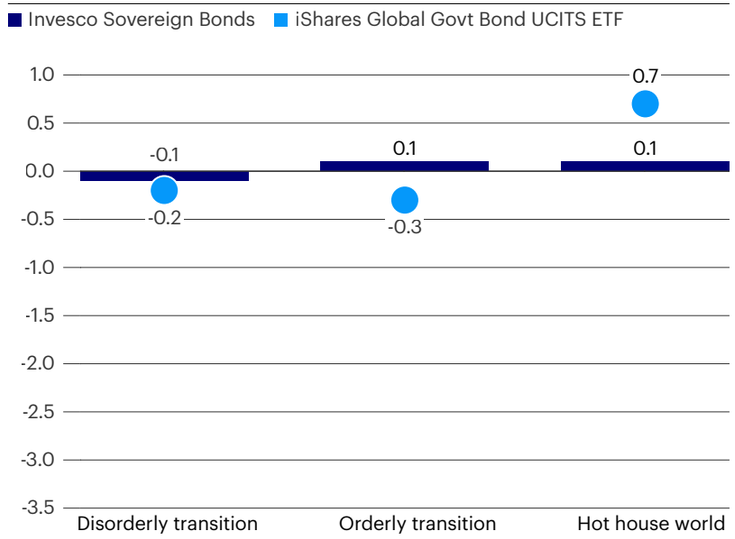


Figure 10
Change in valuation of sovereign bond valuation relative to baseline (%)



09

54% of European pension funds taking notice of climate change

Climate considerations should be firmly on the agenda for UK pension fund trustees due to the recent regulatory landscape and alignment with the Taskforce for Climate Related Financial Disclosures.

Upcoming regulations, within the UK Pension Schemes Act 2021, mandate that climate risks are examined as part of wider governance due diligence. From October next year, all schemes in the UK over £1 billion will be covered by the legislation as opposed to schemes in excess of £5 billion as it is today.

However, many trustee boards have not engaged with the changes. The Pensions Regulator's (TPR) annual survey of 250 Defined Benefit schemes in the UK found that:

- 49% indicated that they had allocated time or resources to assessing any financial risks or opportunities associated with climate change
- Likelihood of allocating time or resources to assessing financial risks and opportunities associated with climate change increased with scheme size, ranging from 19% of micro to 70% of large schemes
- 71% were unaware of the Taskforce on Climate-related Financial Disclosures
- Only 8% made the disclosures it recommends[19]

There is more positive news elsewhere as 54% of European Pension funds are taking climate change into account, up from 14% in 2019[20].

In July 2020, Danish scheme PenSam shifted EUR2 billion into a climate-focused global equity mandate, and the UK's largest pension scheme, the Universities Superannuation Scheme, began divesting from fossil fuels[21].

The Mercer survey of 927 institutional investors controlling total assets of around EUR1.1 trillion, also found that 89% of schemes surveyed consider wider ESG risks as part of their investment decisions. This has risen from 55% in 2019[22].

[19] Percentage of European pension funds factoring climate change risks into investment strategy quadruples in 12 months (institutionalassetmanager.co.uk).
[20] Asset allocation insights 2020 | Mercer.
[21] Percentage of European pension funds factoring climate change risks into investment strategy quadruples in 12 months (institutionalassetmanager.co.uk).
[22] Asset allocation insights 2020 | Mercer.

10

Climate Activism: 100+

The engagement efforts of asset managers will be key in fighting against climate change. With this in mind, Invesco signed up to join the initiative in 2020. It aims to work with some of the world's largest corporate greenhouse gas emitters to act on climate change (see **Figure 11**).

Figure 11
What is Climate Action 100+

Initiative launched in
Dec 2017

works with 100
systemically important emitter' companies

alongside 67
other companies with a significant opportunity to support the energy transition

Collectively, the 167 companies
generate more than 80%
of corporate industrial greenhouse gas emissions

Invesco is also proud to be a Net Zero Asset Manager Initiative signatory. Membership of NZAMI enables us to demonstrate continued leadership on climate issues, deepen engagement with portfolio companies and enhance consultative partnerships with clients. NZAMI's members are committed to reaching net zero across their investment portfolios, in line with the Paris Agreement goal to limit global warming to 1.5°C above pre-industrial levels.

By March 2022 at the latest, in line with our NZAMI commitment, we will present our plans for achieving net zero. We are currently working with our investment teams and clients to define the proportion of assets under management to be managed toward the global goal of attaining net zero by 2050.

We've also scored a top A+ rating for Strategy & Governance by the United Nations-sponsored Principles for Responsible Investing.

We're continuing to use the expertise we've accumulated in ESG investing:

- More than US$35.5 billion in such strategies. Delivering real and positive outcomes for our clients and the environment.
- Engaged with more than 2,000 companies on ESG topics in 2020 and voted on over 10,000 company proposals annually.

Risk Warnings

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

Important Information

By accepting this marketing communication, you consent to communicate with us in English, unless you inform us otherwise.

Data as at 30.06.2021, unless otherwise stated.

This marketing communication is exclusively for use by Professional Clients and Financial Advisers in Continental Europe as defined below, Qualified Clients/ Sophisticated Investors in Israel and Professional Clients in Dubai, Ireland, Isle of Man, Jersey, Guernsey and the UK. It is not intended for and should not be distributed to, or relied upon, by the public. By accepting this material, you consent to communicate with us in English, unless you inform us otherwise.

This is marketing material and not intended as a recommendation to buy or sell any particular asset class, security or strategy. Regulatory requirements that require impartiality of investment/investment strategy recommendations are therefore not applicable nor are any prohibitions to trade before publication.

Where individuals or the business have expressed opinions, they are based on current market conditions, they may differ from those of other investment professionals, they are subject to change without notice and are not to be construed as investment advice.

For the distribution of this communication, Continental Europe is defined as Austria, Belgium, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Hungary, Italy, Kosovo, Liechtenstein, Luxembourg, The Netherlands, North Macedonia, Norway, Romania, Spain, Sweden and Switzerland.

Issued by Invesco Management S.A., President Building, 37A Avenue JF Kennedy, L-1855 Luxembourg, regulated by the Commission de Surveillance du Secteur Financier, Luxembourg; Invesco Asset Management, (Schweiz) AG, Talacker 34, 8001 Zurich, Switzerland; Invesco Asset Management Limited, Perpetual Park, Perpetual Park Drive, Henley-on-Thames, Oxfordshire RG9 1HH, UK. Authorised and regulated by the Financial Conduct Authority; Invesco Asset Management Deutschland GmbH, An der Welle 5, 60322 Frankfurt am Main, Germany.

Israel: This communication may not be reproduced or used for any other purpose, nor be furnished to any other person other than those to whom copies have been sent. Nothing in this communication should be considered investment advice or investment marketing as defined in the Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 1995 (“the Investment Advice Law”). Investors are encouraged to seek competent investment advice from a locally licensed investment advisor prior to making any investment. Neither Invesco Ltd. Nor its subsidiaries are licensed under the Investment Advice Law, nor does it carry the insurance as required of a licensee thereunder.

EMEA ID. 1744621