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Responsible Investment

Strategic Asset Allocation for a +1.5°C World: a proposed framework

What you need to know

Climate change is material risk - Global warming poses long-term physical risks as the climate changes, as well as nearer term risks as the energy sector shifts from fossil fuels to low-carbon alternatives. Climate science and the Intergovernmental Panel on Climate Change (IPCC) have shed light on the global carbon efficiency gains needed to keep the temperature rise by the end of the century to a maximum of 1.5°C compared to the pre-industrial era. The Paris Agreement implies that annual global net CO2 emissions will have to be at zero by 2050 and halved by 2030. This effort is being distributed differently among industries and countries.

A major challenge for long-term investors - Investors are being incentivized to integrate climate into their allocation decisions. This is happening on several fronts:

- Perceptions of investment risks are shifting rapidly to include climate change as a leading concern. In the latest Global Risks Perception Survey, environmental concerns dominate the list of major long-term risks identified among members of the World Economic Forum's multi-stakeholder community.
- There is a growing weight of evidence that climate change is financially material. A study by


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> **Climate change is financially material**

consultants Mercer[1] showed that a scenario keeping global warming to below +2°C is the likely best outcome to investors, compared to +3°C (current Paris Agreement pledges) and +4°C scenarios (business as usual) from a long-term investor perspective. Looking ahead to the start of the next century, a +4°C scenario would leave diversified portfolios down more than 0.10% p.a. compared to a +2°C scenario.

- Regulation and prudential oversight is incorporating global warming concerns in ways that will affect institutional long-term investors. For example, we can highlight regulatory discussion in Europe around the integration of a green or a brown factor into capital requirements.

AXA IM's approach to Climate Change Strategic Asset Allocation - Climate Change is not impacting investment assets in an equal manner. In this research, we present an approach based on current carbon-intensity data and a climate-related typology of assets to enable a strategic asset allocation exercise consistent with a +1.5°C trajectory. ***Our simulations show that incorporating into the SAA the +1.5°C objective of halving carbon emissions by 2030 could be achieved without deteriorating risks-adjusted returns.***

Limitations remain – The lack of data and standards to measure climate impacts remains an obstacle to allowing investors to align to a +1.5°C trajectory. To ensure reasonable investment exposure to sectors at stake in the transition, the following considerations are necessary:

- Metrics used to materialize climate impacts need to be enriched and to be more forward looking

- SAA frameworks and market indices need to be further adapted to better reflect various levels of an asset's maturity in the transition. Through its **alignment investment principles,** AXA IM proposes an introductory framework for further research to better align SAA with the +1.5°C trajectory.

Table 1. Expected annual return impacts of a 2°c scenario

Example industry sectors and asset classes	% p.a. to 2030 in 2°C scenari	% p.a. to 2050 in 2°C scenario	% cumulative impact to 2030 in 2°C scenario	% cumulative impact to 2050 in 2°C scenario
Coal	-7.1	-8.9	-58.9	-100.0*
Oil and gas	-4.5	-8.9	-42.1	-95.1
Renewables	+6.2	+3.3	+105.9	+177.9
Electric utilities	-4.1	-3.3	-39.2	-65.7
Developed market equities	0.0	-0.2	-0.5	-5.6
Emerging market equities	+0.2	-0.1	+1.8	-4.0
All world equities — sustainability themed	+1.6	+0.9	+21.2	+32.0
Infrastructure	+2.0	+1.0	+26.4	+39.4
Infrastructure — sustainability themed	+3.0	+1.6	+42.3	+67.1
All world real estate	0.0	-0.2	-0.1	-4.7

[1] Mercer, The Sequel 2019

Building a +1.5°C-aligned SAA

We have developed the following step-by-step approach to a +1.5°C aligned strategic asset allocation framework:

1. **Identify the base multi-asset portfolio (listed equity and bonds)**
2. **Re-adjust asset classes according to climate emissions intensity and global warming impact**
3. **Conduct Strategic Asset Allocation according to optimizing carbon objective. Shift along the efficient frontier**
4. **Refine and calibrate methodology**

Step 1:

Identify the base multi-asset portfolio

We start with the base of a traditional multi-asset portfolio composed of 44% global equity, 30% global investment grade corporate bonds, 6% high yield bonds and 20% government bonds. We use only listed assets, and avoid exposure to less liquid alternative assets such as property, infrastructure or private equity.

Step 2 :

Re-adjust asset classes according to their emissions intensity and global warming impact

We explore the possibility of aligning this multi-asset portfolio with the +1.5°C goal of the Paris Agreement. This requires halving the carbon impact of assets.

To allow this to happen, we propose establishing a climate change-related index using adjusted sector and country allocations compared to the original parent index. These new sub-indices – which we label as "categories" – will be calibrated into our SAA tool to replace commonly used traditional asset classes indices. We define these climate-related categories based on the current carbon intensity of sectors/countries, with a focus on Scope 1 (direct emissions) and Scope 2 (emissions from externally sourced energy/electricity).

Relying on a sector-mapping approach[2] and based on current carbon intensities, we split assets in the universe into two climate variants:

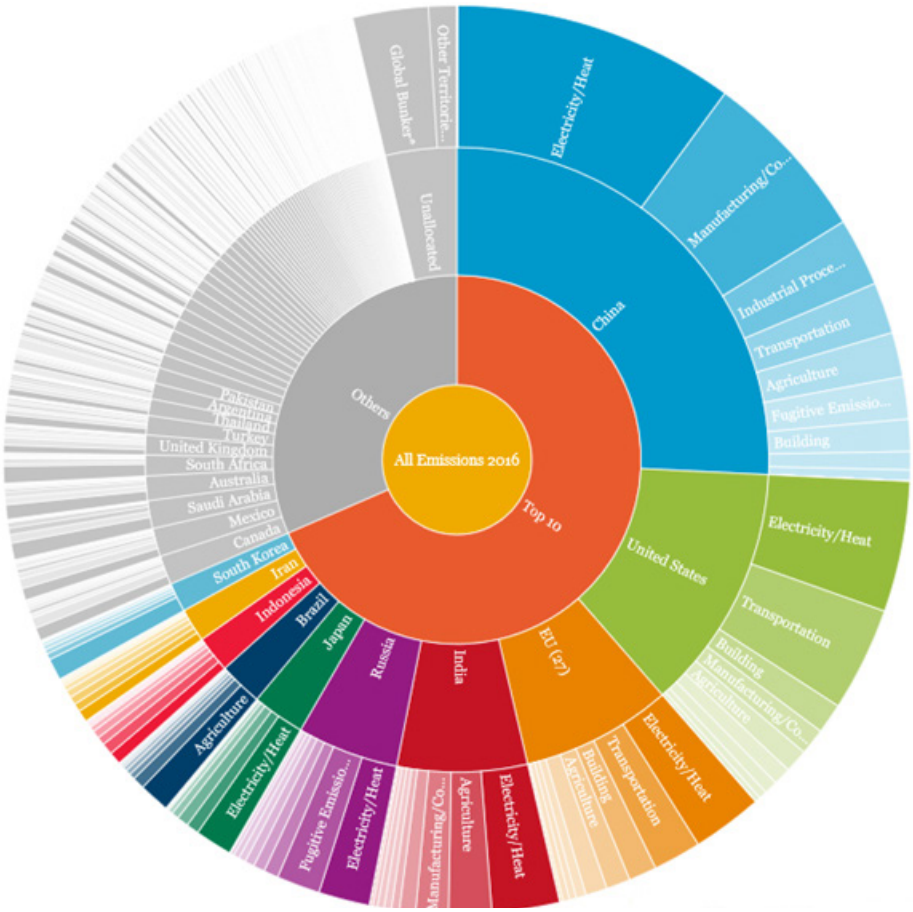
- **Assets "at stake" in climate change** characterized by a high or an intermediate carbon intensity.
  - High climate impact category: These are assets highly exposed to climate risks and carbon intensive activities. For example, companies involved in energy, raw materials, electricity production.
  - Intermediate climate impact category: These are high-stakes sectors but slightly lower carbon emitting assets. For example, companies involved in transportation, real estate, capital goods and consumer-related sectors.
- **Assets "not at stake" in climate change** with low carbon intensity and no clear/observable contribution to global warming.
  - Low climate impact[3] category: For example, companies involved in professional services, health care, telecommunications and financial services.

[2] In the context of the its sustainable finance action plan and the low carbon benchmark directive, the European Commission provides a classification of sectors and NACE industries depending on their climate impact, we can replicate using well recognized market sector classification such as GICS or ICB (see EU Technical Expert Group on Sustainable Finance – Report on Benchmarks September 2019)

[3] In the case of sovereign asset class, high impact category generally correspond to small countries traditionally characterized by higher carbon intensities for size effects reasons. For this asset class, we mainly differentiate between Intermediate climate impact and low climate impact (countries already very exposed to renewables and low carbon assets (France, Italy, Sweden, Denmark, UK, Ireland, Switzerland).

The distribution of carbon intensities in the global economy (and in financial markets) is particularly skewed towards issuers in the high climate impact category. The top emitters by sectors are energy (power and heat), transportation, manufacturing and agriculture. The top emitters geographically are China, the US and Europe.

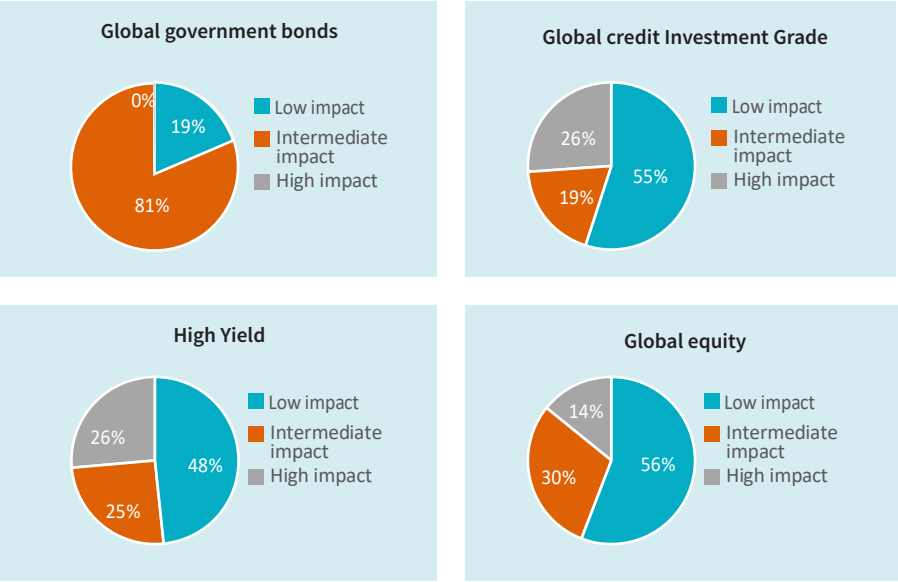
Table 2: The top ten GhG emitters contribute over two-thirds of global emissions



Source: World Resource Institute 2020

Climate change is financially material due to the weightings of high climate impact assets. From an SAA viewpoint, market indices usually used for SAA calibration are nearly equivalently balanced between what we consider "at stake" sectors (high and intermediate impact) and those we consider "not at stake" (low impact). This is shown in the following charts:

Table 3: Climate impact of asset classes



Step 3:

Conduct SAA with the objective of optimizing carbon. Shift along the efficient frontier

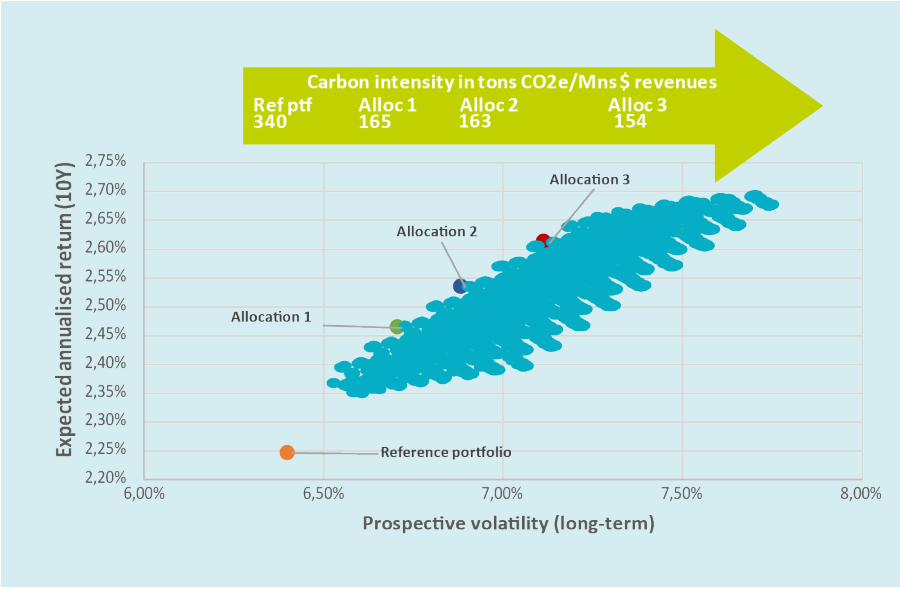
The biggest question for the climate-aligned portfolio is whether the readjusted asset class variants will have similar beta-adjusted returns to their standard asset class counterparts.

If this is the case, it suggests that the SAA process can be modified to create strategic portfolios with significantly higher capital allocations to low carbon assets, but without sacrificing expected risk-adjusted returns.

Our simulations have shown that an SAA which incorporates a climate objective of halving carbon emissions[4] does not lead to a deterioration in risk-adjusted returns. Thanks to greater exposure to assets less exposed to climate change ("not at stake"), optimized allocations enable us to halve carbon intensity while also presenting higher returns and higher volatilities, preserving Sharpe ratios. In total, these allocations are shifting favorably along the efficient frontier – a common method of assessing risk vs return.

> **"Optimized allocations enable us to halve carbon intensity while also presenting higher returns and higher volatilities, preserving Sharpe ratios"**

Table 4:
Alternative allocation optimized on carbon intensity



Source: AXA IM. Prospective analysis over a 10-year horizon on a forward-looking basis with the generation of 10,000 markets scenarios on AXA IM internal simulation tool. The reference interest rate curve is the EUR swap curve as of Q1 2020.

[4] Here, as per the recommandation of the EC Technical Advisory Group for Paris Aligned Benchmark, we re-interpret the +1.5°c trajectory alignment condition as a halving of carbon intensity.

> **Using carbon intensity as the sole indicator to reflect the climate objective does not guarantee sufficient exposure to sectors at stake in the transition**

Step 4:

Refine and calibrate methodology - incorporating alignment investment principles

The SAA optimization process described above succeeds in respecting financial objectives and achieving the climate objective of halving carbon intensity. However, one unintended consequence is a significant shift of allocation towards assets "not at stake" and away from high impact "at stake" assets. That leaves investments more concentrated in low climate impact sectors and less diversified.

The climate-aligned portfolio must have sufficient diversification between asset classes, sectors and regions. By adopting this SAA approach of optimizing carbon intensity, we also need to ensure that we are not inadvertently overly exposed to a single sector or region. Using carbon intensity as the sole indicator to reflect the climate objective does not guarantee sufficient exposure to sectors at stake in the transition.

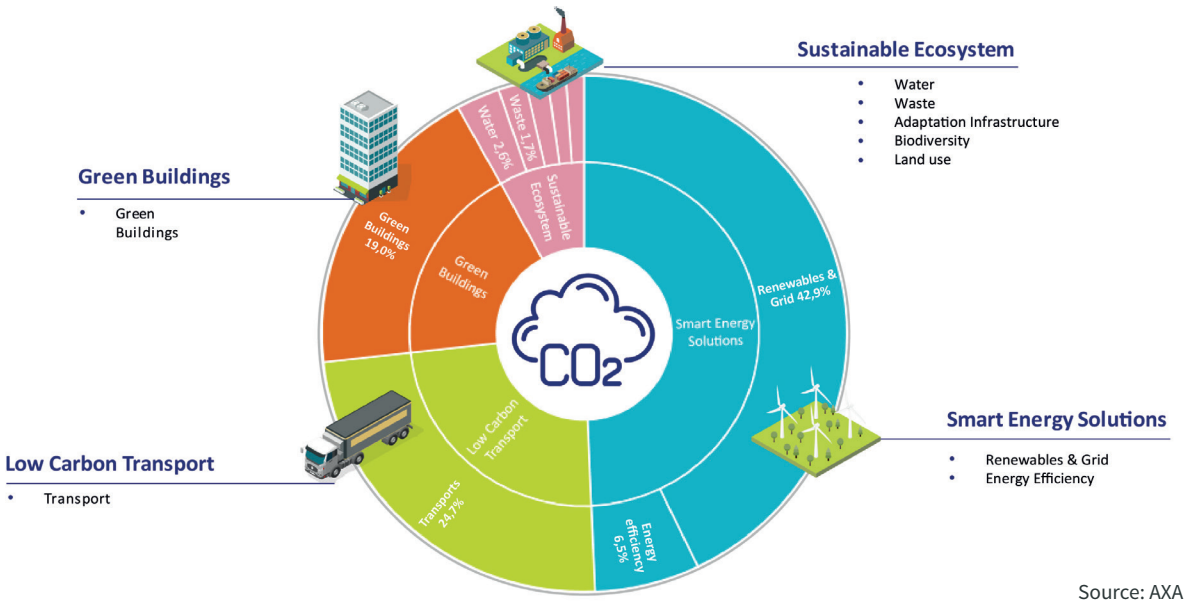
To counter this effect, we need to refine and calibrate our methodology. and explore the possibility of a +1.5°C aligned SAA methodology that will allow for investment diversification while contributing enough to the transformation of sectors at stake.

We propose an introductory framework for further research:

1) **Enhance current climate impact data by incorporating a forward-looking approach**

It's clear that we need to dissect the carbon emissions data being used. This is an immediate area for improvement in the methodology. We see that solely using backward-looking Scope 1 and Scope 2 carbon emissions reported by companies could lead to sub-optimal SAA outcomes that are too skewed to "not at stake" assets. We need to be aware that these data tend to underestimate the real contributions to global warming of some assets considered "not at stake" (e.g. financials, telecoms etc). The consideration of Scope 3 (emissions from products and services) in current carbon footprints would be a key condition to measure the true exposure of an SAA to climate risks and opportunities.

Table 5: AXA IM internal green taxonomy: a grid to measure greenness of investments across all assets



Source: AXA IM, 2019

Corporate reporting on Scope 3 emissions remains poor. This is due to a lack of industry methodology as well as an inability to assess accurately how products are used in the real world (such as car companies estimating how intensively its automobiles are used). A better understanding of the revenue and operations mix of companies would improve our calculation of the real-world carbon performance of assets.

Investors need to shift to a more forward-looking approach which considers the carbon pledges expressed by issuers and the alignment of their corporate strategies to the relevant industry climate transition pathway. There also needs to be analysis of the capability of those issuers to meet their commitments.

From an SAA perspective, the climate objective can be achieved either through asset re-allocation or on tactical selection of certain issuers based on their ability to shift to a +1.5°C pathway in the future. Innovative metrics such as warming potential (temperature) of business models or new carbon pledge frameworks such as "Science Based Targets" are new measures that an SAA could rely on to reflect the +1.5°C objective. For more on scenario analysis and warming potential – please refer to our research "Climate Scenario Analysis: Assessing the future for investments".

Beyond carbon emissions and intensities, alignment and greenness should be measured by combining historical and forward-looking scientifically based metrics. This analysis should not be limited to quantitative measures, it also encompasses an in-depth qualitative assessment of the company's ability to transition its commercial model and meet its strategic targets. This should be supported by an active programme of investor engagement with the issuers' management.

2) Further redefine asset classes to better reflect maturity in the transition

As part of its climate strategy, AXA IM has drafted 10 alignment investment principles that a portfolio could incorporate to best contribute to the Paris goals.

These principles break down the investment universe into three categories of issuers depending on their level of alignment with the Paris Goals, and on their "greenness". For corporate investments these are:

- **Carbon industry leaders:** the best carbon performers in sectors "at stake" (that is, climate most impactful industries)
- **Transition leaders:** companies in transition to a Paris-aligned trajectory
- **Green leaders:** core green companies (already low carbon and contributing fully to the energy transition)

In the next steps, climate experts and financial engineering teams should work together to explore ways to align an SAA with the +1.5 °c trajectory along this proposed framework and the redefining of asset classes.

Table 6: AXA IM Alignment Investment Principles – a set of proposals to integrate alignment objectives within portfolio management

Proposal #1	Invest in Low carbon industry leaders – Sectors at stake
Proposal #2	Invest in Green leaders – Any sectors
Proposal #3	Invest in Transitioning leaders – Any sectors
Proposal #4	Ensure consistency of targets with overall company strategy – Any sectors
Proposal #5	Consider the overall carbon performance of companies depending on the sector – Any sectors
Proposal #6	Consider climate awareness and quality of the management about climate issues – Any sectors
Proposal #7	Reduce carbon emissions and mitigate climate risks
Proposal #8	Adjust exposure to non-contributing companies depending on investment mandate
Proposal #9	Monitor portfolio's climate alignment indicators
Proposal #10	Monitor overall ESG performance

Investment Managers

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