

Carbon reduction: Moving away from carbon footprint towards carbon *footpath*



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The challenge

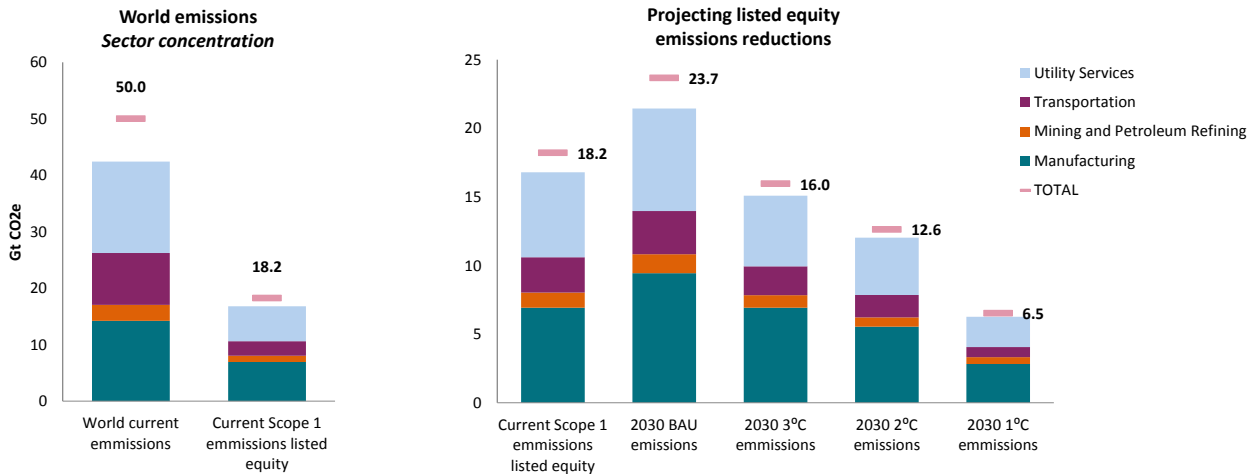
As concerns surrounding climate change continue to intensify, equity investors increasingly need to understand how this could impact their investment portfolios. In addition to obvious financial concerns related to future fundamentals, the shift is being driven by policies and legislation, as well as climate data itself.

On the legislative front, the most ambitious example is the Action Plan on Sustainable Finance in the EU, a series of sweeping rules, some of which are expected to come into effect as early as April 2020. This could include the establishment of labelling law for two new categories of regulated climate benchmarks that aim to reduce carbon by 30-50%, and mandatory ESG disclosure by benchmarks for every asset class to demonstrate alignment with carbon reduction.

As for the data, in a recent research paper¹ AXA Investment Managers' climate experts explain that about 420 gigatonnes of the global carbon budget is left before hitting the 1.5°C warming threshold irreversibly. This represents only about eight years of annual emissions based on the level recorded for 2017 – 50 gigatonnes carbon dioxide equivalent (GtCO₂e) according to specialised data from Carbon Delta.

¹ 'Climate scenario analysis: Assessing the future for investments', AXA Investment Managers September 2019

Charts 1 and 2: Total world emissions and top polluting sectors; carbon reduction targets for various temperature scenarios



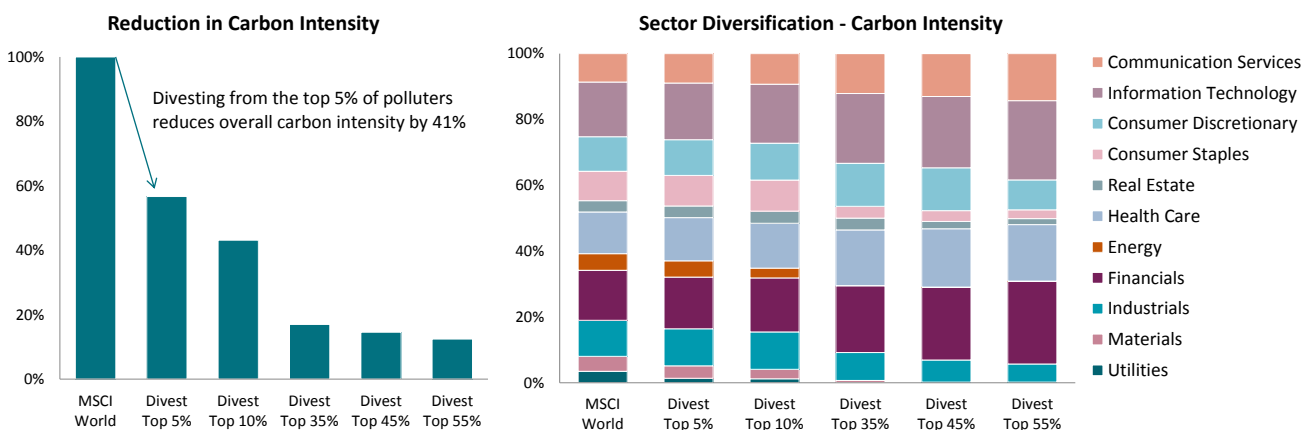
Source: AXA Investment Managers, Rosenberg Equities, Carbon Delta (an MSCI company). Exhibit created in May 2019 using internal sector classifications, 'Current' emissions refers to 2017.

The data in charts 1 and 2 above show that listed equity companies, as a subset, are responsible for an estimated 18 GtCO₂e of Scope 1 emissions (direct emissions from owned or controlled sources), and would need to reduce their emissions by at least 30% from current levels – or almost 50% if we account for revenue growth – to meet the baseline scenario of a 2°C increase in global temperatures by 2030. By way of comparison, the Intergovernmental Panel on Climate Change (IPCC) has estimated a reduction of 45% is required by 2030 to reach the 1.5°C scenario, and 100% by 2050 (net zero carbon objective). Both sets of figures point to dramatic reduction requirements, largely focused on utilities, transportation and material-intensive manufacturing. However, we know that the activities of these sectors support the global economic growth engines so, for an investor, it is not as simple as just avoiding them altogether.

Current practice – divestment from the biggest polluters

Many asset owners and investors divest from the largest polluters in order to reduce the carbon footprint (point-in-time carbon intensity) of their portfolios. In practice, this approach, also known as 'de-carbonisation', has meant excluding investments in companies that exhibit high scope 1 and 2 carbon intensity (i.e. high direct and indirect emissions tied to company activity), defined here as emissions per \$1 million revenue.

Charts 3 and 4: The effects of point-in-time de-carbonisation on portfolio carbon intensity and sector diversification



Source: AXA Investment Managers, Rosenberg Equities, Trucost, MSCI, as of August 31, 2019. Sector diversification chart uses GICS sector classifications.

We have illustrated the effect of ‘de-carbonisation’ in chart 3, by using carbon data from Trucost for the MSCI World index as a proxy for global listed equity with robust data coverage. This shows that divesting from as little as 5% or 10% of the index’s most polluting companies can dramatically reduce the point-in-time carbon intensity, and potentially help asset owners avoid headline risks.

However, as demonstrated in chart 4, by targeting the top polluters based on current point-in-time emissions, it becomes difficult to build a well-diversified portfolio as whole sectors are eliminated – starting with utilities – thus quickly increasing active investment risk. In addition to posing these sorts of unintended problems for core equity investors, a divestment-led approach to carbon reduction also means that investors have less leverage to use with respect to engagement and the goal of encouraging a transition towards greener and more sustainable products, technologies or activities. This is especially the case for utilities that need to evolve to continue providing current power supply to the economy and meet future energy demands from hotspots like electric vehicle fleets and data centres. From a purely investment returns perspective, the divestment-led approach targeting point-in-time, absolute carbon intensities ignores the potential winners of a future low-carbon economy. It treats all polluters the same instead of seeking out those that are evolving.

Ideally, instead of only relying on this type of point-in-time de-carbonisation, we would rather form a forward-looking view on a company vis-à-vis its emissions behaviour. This shifts the focus from a single, static metric (carbon footprint) to using several types of information to form a view of the company’s commitment to future emissions reduction – what we refer to as carbon *footpath*.

Evolving carbon footprint into ‘carbon footpath’

It is often mentioned that the E of the ESG framework (environmental) is not sufficient to support climate change mitigation goals. However, we believe that such a holistic measure of a company’s focus on the environment must have a role to play. In particular, we expect that companies with best-in-class environmental practices within their peer group are more likely to show greater commitment to emissions reduction.

Our Responsible Investment team uses a proprietary ESG framework to calculate companies’ ESG scores. As shown in chart 5, the E pillar of this framework incorporates two main factors – *Resources & Ecosystems* and *Climate Change* – which capture multi-dimensional information such as operational resource and energy efficiency, as well as the impact of company activities on the climate and the environment.

Chart 5: The E pillar and sub-factors from the AXA IM ESG framework

E	Resources & Ecosystems	Use of natural resources in companies’ operations and protection of ecosystems by avoiding negative impacts	Waste management, biodiversity and natural capital impacts, other toxic emissions, packaging and raw material sourcing
	Climate Change	Impacts related to companies’ activities that contributes to, or works to resolve, climate change challenges	Carbon emissions, energy efficiency, environmental impacts and carbon footprint management, green opportunities (green building, renewables, clean tech...)

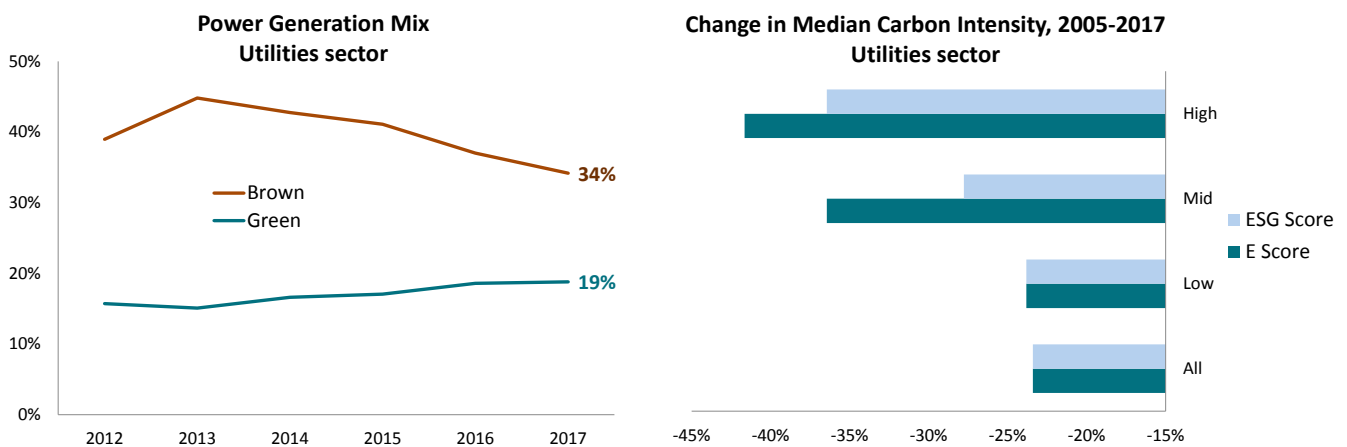
Source: AXA Investment Managers. AXA IM reserves the right to modify its definitions at any time.

The ‘climate change’ dimension also directly aligns with global climate-focused initiatives like the UN’s Sustainable Development Goals (SDGs)² because those companies broadly and strategically committed to the environment, as reflected through a best-in-class E score, typically invest more than their peers in green technologies and initiatives.

² The SDGs were adopted by all UN Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.

Let's take utilities, the sector with highest carbon intensity, as an example. We see in chart 6 that the sector as a whole has been gradually diversifying away from thermal coal and other 'brown' assets³ and investing more in renewable power generation sources. While this is encouraging, we also know that not all companies are on board with a climate change transition, or have the same transition pace. When we analyse the companies through the E score lens – a multi-dimensional view of a company's environmental commitment – we see that this holistic view helps us identify the leaders and laggards within a sector, as shown in chart 7.

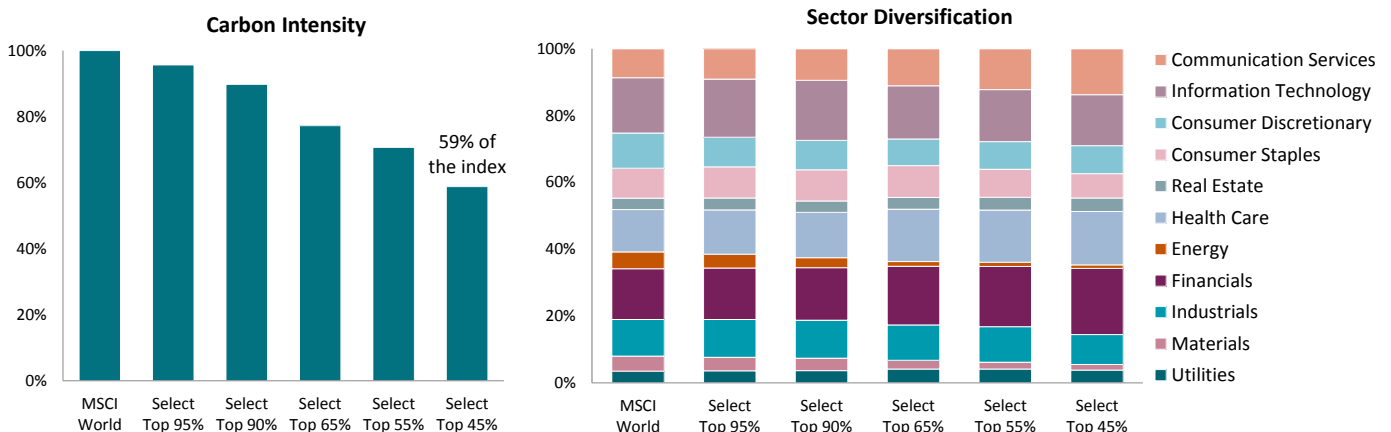
Charts 6 and 7: Power generation mix trend and change in carbon intensity by company E scores, utilities sector



Source: AXA Investment Managers, Rosenberg Equities, Trucost, MSCI. Data is for the financial years 2012-2017. Universe is the utilities sector as defined by GICS within MSCI World. The definition of green and brown power generation is per the Trucost taxonomy. ESG scores calculated by the AXA IM Responsible Investment team. ESG/E score buckets are as follows: High (70th percentile); Mid (50th percentile); Low (5th percentile).

Here, we see that the utilities sector has seen a median decrease in carbon intensity of around 24% over the period 2005-2017, but utilities companies with the highest E scores have median reductions above 40%. Even in other sectors where company behaviour towards carbon intensity is generally not as conducive to mitigating climate change, such as energy, we find that viewing companies through the E lens also helps to find those that are ahead of their peers with respect to a 'green' transformation. What if we used E score instead of carbon intensity to 'de-carbonise' a basket of stocks? In chart 8 we apply the same logic as before, but using E Score as the criteria for divestment.

Charts 8 and 9: Effect of selecting best-in-class E stocks on portfolio carbon intensity and sector diversification



Source: AXA Investment Managers, Rosenberg Equities, Trucost, MSCI as of August 31, 2019. Sector diversification chart uses GICS sector classifications.

³ 'Brown' assets are those that are *obstructive* to the goals of climate change mitigation and/or sustainable energy (i.e. the opposite of 'green').

Here, we systematically eliminated the lowest-scoring companies in the index in 5% increments. We must acknowledge that using this approach does not reduce portfolio point-in-time carbon intensity at the same rate, though we do see a decrease. But importantly, the companies that remain are those that have done more to *improve* emissions by beginning to transition before others in their respective industries – for example, electric utilities that have shown a higher propensity to invest in renewable energy and storage solutions and divest from thermal coal.

Another critical element to investing in the best-in-class E companies is that we maintain representation in all sectors, as shown in chart 9, and thus minimising the investment issues encountered in an approach that considers only point-in-time emissions. In that same vein, staying invested in these types of companies also gives active investors the opportunity to engage management to both qualitatively verify the ‘E’ aspects of a company (with the goal of enhancing our quantitative view) as well as to push them to further accelerate their climate change transition.

Furthermore, we can also potentially benefit from the upside of investing in the climate change leaders that are better able to navigate the rapidly-tightening regulatory landscape. So while it is true that eliminating companies based on E score does mean we lose our ability to vote and engage with the true laggards, we retain a foothold in the sector that allows us to continue to influence best practices. Ultimately, scrutinising companies based on E score is a step forward in terms of transitioning from carbon footprint to carbon footpath, but it is not the only way we can improve upon the ‘carbon footprint’ perspective.

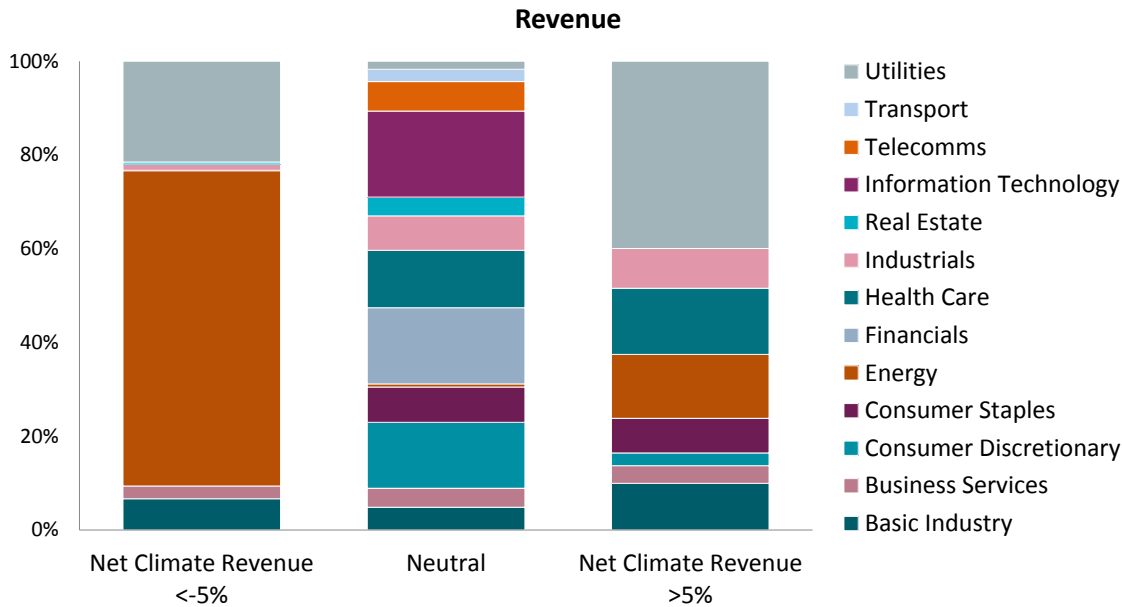
Adding a product perspective

As we shift the focus from carbon footprint to carbon footpath in search of a better way to meet climate change goals in listed equity, we can further improve our analysis by also considering additional company information like ‘green’ or ‘brown’ climate revenue. This dimension points more directly to how a company is supporting the broader societal change that is required to mitigate climate change through their production of ‘green’ goods and services.

We can do this by identifying revenues as a proxy for a company’s goods and services that are aligned with social or environmental goals, often expressed as UN SDGs. In our case we are interested in sustainable products or activities that help to mitigate climate change, like wind energy or battery storage solutions i.e. those in alignment with UN SDGs #7 (ensure access to affordable, reliable, sustainable and modern energy for all) and #13 (take urgent action to combat climate change and its impacts). To this end we have adopted the taxonomy developed by ISS-Oekom to define ‘green’ climate revenues (i.e. those significantly contributing to the goal of mitigating climate change) and ‘brown’ climate revenues (i.e. those significantly obstructing the goal of mitigating climate change).

When looking at the data, we note that some companies with ‘green climate revenue’ also have exposure to ‘brown climate revenue’. This is especially true for the most polluting sectors like utilities and energy, in that the companies are also providers of clean and green solutions. For this reason, we use ‘net climate revenue’ (i.e. % green climate revenues - % brown climate revenues) as a metric to assess the level of transition. Using this logic, a positive number represents net ‘green’, while a negative number represents net ‘brown’. We illustrate this concept below in chart 10 by again using the MSCI World index, grouping its constituent companies into three buckets of net climate revenue: (i) <-5%, (ii) neutral and (iii) >5%.

Chart 10: Sector distribution of companies in three groups: net climate revenue <-5%, neutral and >5%



Source: AXA Investment Managers, Rosenberg Equities, ISS-Oekom, MSCI. Data as at April 2019. Universe is MSCI World Index using Rosenberg Equities' internal sector classification. Net climate revenue = % green climate revenues - % brown climate revenues (where 'green' climate revenues are those significantly contributing to the goal of mitigating climate change and 'brown' climate revenues are those significantly obstructing the goal of mitigating climate change). No. of companies per 'net climate revenue' group as follows: <-5% (100); neutral (1,203); >5% (20).

Clearly, there is a sector story that begins to emerge; utilities, energy and basic industry in particular are some of the highest-polluting sectors. As an aside, one of the perennial challenges in quantitative investing is data coverage. In this instance, we have reasonable coverage, however the vast majority of companies have no revenue contribution or obstruction relating directly to the UN SDGs, meaning their products and/or services neither help nor hinder climate change mitigation.

This group includes banks, insurance companies and technology firms which generate revenues that are not meaningfully impactful in the context of climate change when viewed through this lens. But investors should use green revenues, whenever applicable, to reinforce the idea of transition and take advantage of opportunities that mitigating climate change can bring. For the purposes of this paper, we can view companies from a 'net climate revenue' perspective to help assess their commitment to climate and emissions reduction.

A few words about indirect effects

We would be remiss if we did not acknowledge that 'de-carbonisation', as practised by most investors, is focused on scope 1 and 2 emissions. While these two types of emissions should be the focus if we are to address climate change, we cannot forget about the indirect effects of companies' products and activities throughout the value chain.

There are a vast number of publicly-traded companies with activities contributing to climate change, even though they themselves are not pulling coal out of the ground. Industrials, real estate, transport, food production – these are all businesses that contribute indirectly to aggregate emissions (Scope 3). Data on indirect emissions is difficult to find or estimate for a number of reasons, but by broadening our view beyond point-in-time direct emissions to include E score, revenue, and other trending physical data, we can start to capture some indirect emissions information. This would not be possible if we were to rigidly tie ourselves to 'carbon footprint' in the traditional way.

Case study

Company	Carbon Intensity	ESG Score Percentile	E Score Percentile	% Change Carbon Intensity	Green Energy Generation (GWh)	Change Green Energy Generation	Brown Energy Generation (GWh)	Change Brown Energy Generation	Net Climate Revenue	
Japanese Utility	97 th	5 th	25 th	+12%	20%	+4%	57%	+26%	-34%	REJECT
US Utility	97 th	88 th	87 th	-44%	25%	+12%	3%	-2%	20%	KEEP
Spanish Utility	90 th	99 th	96 th	-43%	37%	+5%	2%	-10%	9%	KEEP

Source: AXA Investment Managers, Rosenberg Equities, Trucost, ISS-Oekom. Time period for 'change' is 2005-2017. For some companies, energy generation is not the sole business activity. In those instances, net climate revenue could appear significantly less when compared to green energy generation. This example is for illustrative purposes only and not meant as an investment recommendation.

To illustrate how several types of information can help us gauge carbon *footpath*, the table above shows three major utility companies (anonymised) that are among the top emitters in the world. If we only apply the point-in-time de-carbonisation rule introduced at the beginning of this paper, these would be among the first stocks to be removed from a hypothetical portfolio. But when we view them using a more robust set of data, a different picture begins to emerge. In this view, we use not only point-in-time carbon intensity, but E score, change in carbon intensity as well as percentage of energy generated from green sources and net climate revenue. Together, these data help us to build a holistic view of the companies' carbon footpaths.

Right away, we see that the Japanese utility company has a low E score; the result of a poor environmental record and large carbon footprint from a power generation mix largely from thermal coal. More importantly, we have not seen much evidence of the company moving in the right direction. It has made limited efforts to increase its renewable capacity, which might seem substantial, but is actually below industry average. In addition, the company has continued to add dirty energy sources to its power generation portfolio. As a result, the company's carbon intensity has continued to increase over time, while its net climate revenue has significantly decreased as a result of the dirty energy sources that obstruct efforts to mitigate climate change.

The US and Spanish utilities, on the other hand, are among the leaders in the industry in transitioning towards a low carbon economy. Over time they have steadily increased the share of renewable energy and become more efficient in their power generation mix. They have also indicated their continued commitment to reduce carbon footprint by planning to steadily invest in clean tech through 2025-30. We can see these actions manifest in the data as the companies' carbon intensities have significantly declined over the years. Furthermore, the revenues these companies generate from renewables and other green energy sources have continued to climb. As part of a more forward-looking investment policy with regards to climate change mitigation, we would therefore suggest that such companies are exempted from the cull that a pure decarbonisation approach would make.

What's next?

We have already started to notice a shift in focus among institutional investors when it comes to de-carbonisation. As we look to address the impact of climate change risk on our investment portfolios, it is important to note that aiming to reduce point-in-time carbon footprint through a divestment-led approach is an effective but blunt tool that may not be sophisticated enough for such a complex issue. Instead of leading with divestment, we need to incorporate several types of information to form a more holistic view of company behaviour towards tackling the need to reduce global carbon emissions and protect the environment so that we can more concretely anticipate their pathway towards transition.

A special thanks to Lise Moret and Yo Takatsuki of the AXA Investment Managers Responsible Investment team.

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