The energy transition in APAC: Security selection in the fight for the world's climate future

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Executive Summary

The Asia-Pacific (APAC) region will be the most important battleground in the world's fight to decarbonise energy systems. Capturing the region's climate-related investment opportunities requires a deep understanding of its economic and climate policy differences. abrdn's climate scenario and analytics platform provides deep insights into how APAC companies' climate exposures differ from one another, as well as from their peers in other parts of the world. This provides a strong and unique complement to our active stock research, selection, portfolio construction and engagement activities.

- **Five of the world's ten largest carbon emitting countries – China, India, Indonesia, Japan and South Korea – are located in APAC**. Because APAC is expected to be the fastest growing region in the next decades, it is likely to make the largest contribution to energy usage and emissions over that period.
- **APAC includes economies at vastly different stages of development, with different carbon intensities and climate policy settings**. As a result, market indices, and their constituent firms differ in ways that significantly affect climate exposures. It is critical for investors to understand these intra-regional differences if they want to seize climate-related investment opportunities and avoid major risks.
- abrdn's climate scenario and analytics platform allows us to analyse how the nature of individual companies' equity exposures in the APAC region are different from those in other markets. We find that **index-level exposures to our 'mean' climate scenario are on average larger across the APAC region than for the global benchmark, as well as US and European indices**.
- But **these exposures are also more varied; the MSCI India index displaying the greatest vulnerability and the MSCI China index the least**. They also increase the closer the scenarios are aligned with the objectives of the Paris Agreement. Differences in sector weightings play a major role in this variation.
- A key finding of our global analysis was that the significant increase in the electrification of the energy system in our 'mean' scenario generates **a lot of valuation uplifts in the utility sector**. This is also true across the APAC region, but the average benefits are smaller because policy in the power sector is expected to be less stringent and there are fewer large-cap firms with significant renewable portfolios.
- **Despite the carbon intensity of the Chinese economy, the MSCI China All Shares index has the lowest average negative exposure of all the major APAC indices**. Many of the country's most fossil fuel intensive firms are non-listed state owned enterprises – a reminder that the structure of a country's economy is often not a reliable guide to the composition and drivers of its public markets.
- As was the case in our global analysis, **the primary source of variation in exposures across the region is at the security level**. Even within the generally negatively exposed energy sector, estimated valuation effects in our mean scenario range from impairments of 60% to uplifts of 40%. This demonstrates the importance of careful stock-specific research and selection when building climate-resilient portfolios.
- Though the policy and technology pathways that underpin our scenarios are forward looking, firms react 'passively' rather than 'dynamically' to the changing environment in our core analysis. We address this by **incorporating the transition plans of 390 large, carbon intensive companies into our analysis**. For companies like Toyota, this can make a significant difference to their estimated exposures.
- **abrdn's teams of stock analysts and portfolio managers are actively incorporating these insights into their research and investment decisions, as well as into their engagement with companies. Our platform also underpins abrdn's growing range of climate funds and solutions.**

abrdn's climate analytics and scenario platform: a refresher

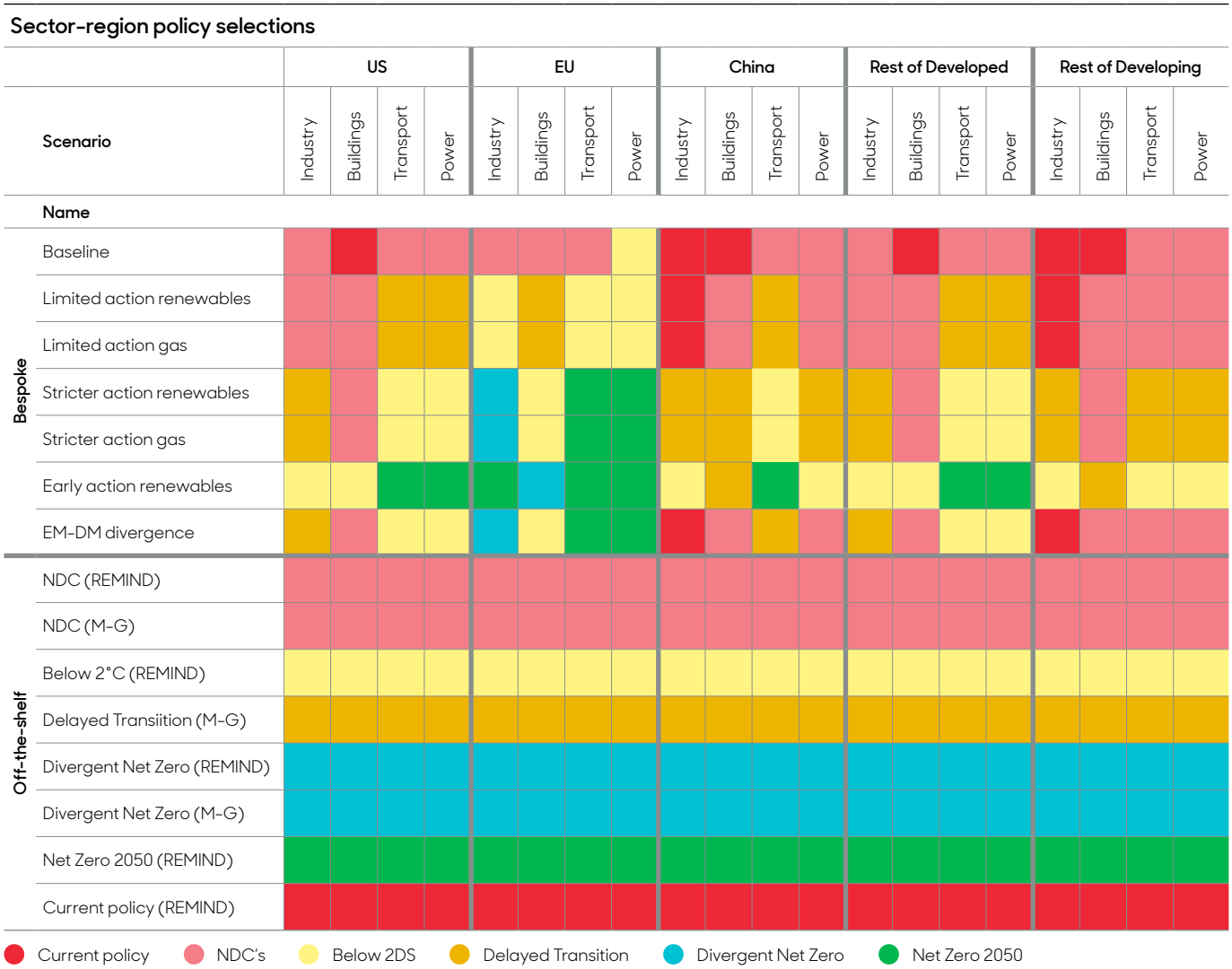
At abrdn we have developed a unique platform for analysing the climate-related valuation risks and opportunities listed corporations are exposed to. The key features of this platform are that we:

01	Build our own 'bespoke' climate scenarios that capture the way that the world's major emitting sectors and regions are currently, and will likely remain, subject to very different climate policies and hence energy transition exposures.
02	Take into account the uncertainty surrounding long-term policy and technology pathways by developing a large suite of scenarios that incorporate as much of the potential investment-relevant variation as possible.
03	Apply probability weights – based on our fundamental research processes – to these individual scenarios to generate a probability-weighted 'mean' scenario (our view of the most likely pathway), which is then benchmarked against the climate transition we think is priced into assets.
04	Use this 'mean' scenario to generate the most likely 'fair' long-term valuation impairment or uplift estimates for individual securities, sectors and regional indices, and how they are likely to vary over time, while also analysing the most plausible risks to this central view.
05	Add an option through which the dynamic energy transition strategies of the major emitting companies can be incorporated into the core scenario results to deliver even deeper insights into firms' 'true' transition exposures.

The sophistication of this framework allows abrdn to go beyond a simplistic assessment of 'tail risk' exposures to highly stylised and ultimately improbable climate pathways, and instead build an approach that is fit for investment integration and the development of innovative climate products and solutions.

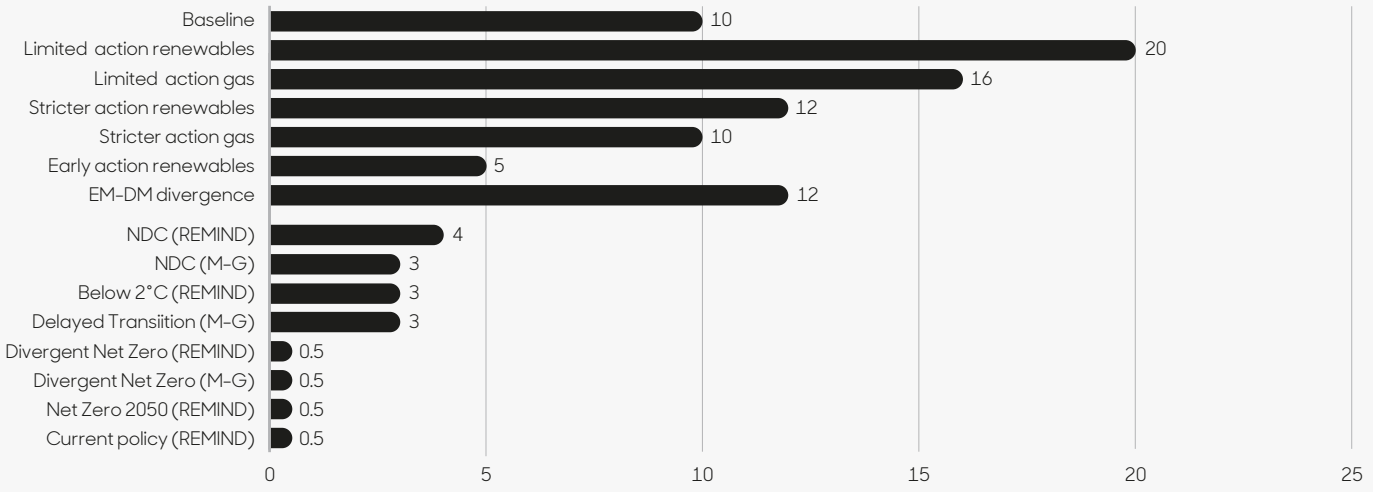
More detail on the key design characteristics of abrdn's scenarios and what they mean for the future of the energy system and investment risks and opportunities in listed equities and credit, can be found in our **initial scenario white paper** and our **2021 update**. Figure 1 summarises our current suite of scenarios and the probabilities we attach to them.

Figure 1: abrdn's suite of bespoke and off-the-shelf scenarios



Probability

Scenario weightings (%)



Source: abrdn / Planetrics. June 2021. For illustrative purposes only.

APAC's unique energy transition characteristics

The Asia Pacific region plays a very important role in our analysis. 45% of the securities incorporated into our analysis are listed or issued by APAC domiciled companies. And three of the five global regions specified in our scenarios are dominated by APAC countries and therefore firms – China, Developed Markets (ex-US and Europe), and Emerging Markets (ex-China).

Moreover, the APAC region has a number of other characteristics that mark it out as especially important in identifying climate-related investment risks and exposures, including that:

- **Five of the world's ten largest carbon emitting countries – China, India, Indonesia, Japan and South Korea – are located in APAC**. Australia, Malaysia, Taiwan and Thailand are also ranked in the top-25. Moreover, in the coming decades, APAC is expected to be the fastest growing region in the world in economic terms, more than double the rate of Europe and North America. Given the close relationship between economic growth and energy demand, it is therefore also likely to make the largest contribution to cumulative energy usage and carbon emissions over the period.
- **The APAC region encompasses economies at vastly different stages of development and carbon intensity.** Australia, Japan, New Zealand, Singapore, South Korea and Taiwan are amongst the world's wealthiest countries and can more easily absorb rapid decarbonisation. Cambodia, India, Laos, Pakistan, Philippines, Bangladesh and Vietnam are much poorer and face much larger barriers to reducing carbon intensity as they attempt to close their gaps in livings standards with the rest of the world.
- **Climate policy – both in terms of objectives and instruments – also varies enormously across the region**. For example, each of the major APAC economies now has a target, or at least an ambition, to achieve net-zero emissions. But the timescales differ significantly - 2050 for Australia, Japan, Malaysia, Taiwan and South Korea; 2060 for China and Indonesia; and 2070 for Thailand and India - as do their credibility. In the aggregate the APAC region is very unlikely to achieve net zero emissions by 2050. Even those developed countries like Australia, Japan and Korea, who have the moral obligation to decarbonise the fastest due to their historic emission levels and their greater capacity to transition have targets that currently lack credibility.
- **The structural characteristics of economies, equity and credit indices, and their constituent firms differ across the APAC region**, as well as from their European and US counterparts, and in ways that significantly affect climate exposures. For example, China is a manufacturing heavy economy, and its firms play a key role in renewable technology supply chains. And Australia has an outsized mining and materials sector, and coal is a large source of demand for many of its largest firms.

Through these channels, the nature of the climate risks facing individual companies in the APAC region, and the wider investment community, are different from their counterparts in other markets, and hence a source of significant, active investment opportunities. And through our unique climate analytics and scenario platform, abrdn is in a stronger position to identify, value and action these opportunities.

Greater dispersion in index and sector exposures across the APAC region

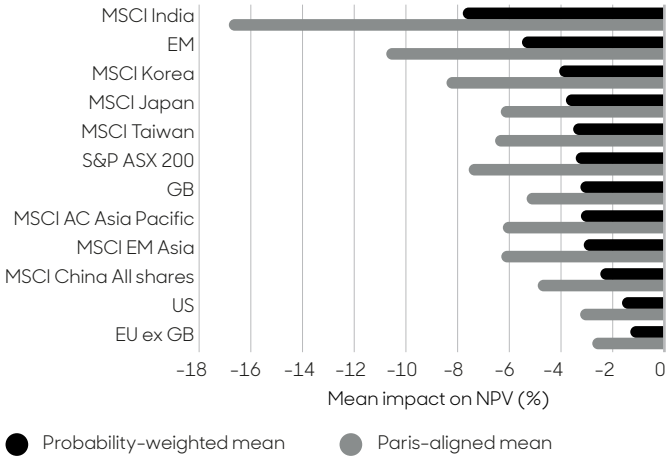
A hallmark of our core climate scenario results was that at the global level, and across the largest developed markets outside of the APAC region, equity index level exposures under our 'mean' climate scenario were generally very modest. Indeed, in most cases, long-term fair valuation impairments are not much larger than the variance in the returns of these indices in a typical week.

However, when we turn our attention to the major APAC benchmarks, exposures are larger, on average, but also more varied (see Figure 2). On one end of the scale we have the MSCI India index, which under the mean scenario has a valuation impairment of just under 8%. On the other we have the MSCI China index, with a negative exposure (2.5%) that is only modestly higher than the US and Europe. In between we have the Korean, Japanese, Taiwanese and Australian indices that all have larger than average negative exposures. Notably, the aggregate APAC benchmark is less negatively affected than the aggregate EM benchmark.

Unsurprisingly, negative exposures increase the closer the scenarios are aligned with the objectives of the Paris Agreement. Valuation effects in our mean 'Paris-aligned' scenario – which is consistent with global temperature increases being held at approximately 1.6°C, compared with the 2.2°C in our 'mean' scenario – are often twice as large, especially in markets like Australia where the greater policy ambition of a Paris-aligned pathway significantly pulls down the value of natural gas assets.

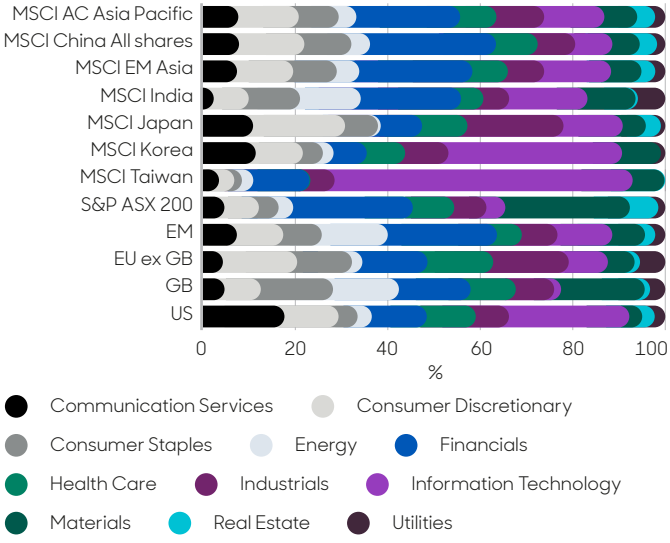
The differences in country index exposures are partly due to sector weightings (see Figure 3). In almost every market the energy sector is the most negatively exposed to the energy transition. But because the weight of energy in the Indian index is more than three times larger than in China, this contributes to the larger negative aggregate exposure.

Figure 2: India's equity market the most exposed and China's the least to our mean scenario



Source: abrdn/Planetrics, February 2022. Means weighted by market cap (for each index).

Figure 3: Sector weights vary significantly across the major APAC benchmarks

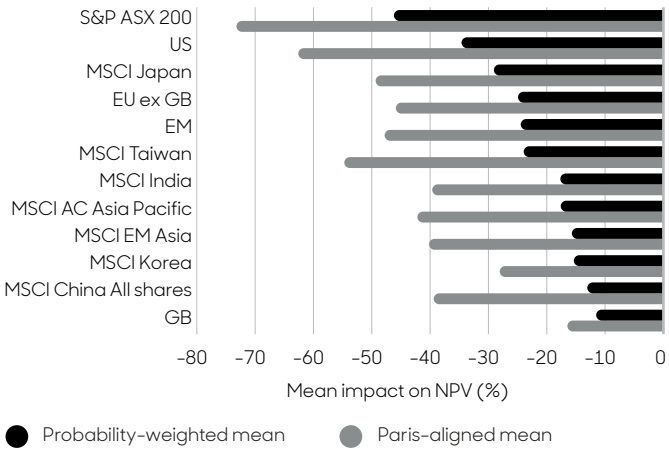


Source: abrdn/Planetrics, February 2022. 'Mean' scenario. Sectors weighted by market cap (for each index).

To further illustrate the point of how important sector weight variation can be, consider how each market's energy sector is affected under our mean scenario. India's energy sector is estimated to have a smaller exposure than the Australian, Japanese and Taiwanese sectors. However, the much higher weight of the energy sector in the aggregate index more than offsets those forces (see Figure 4).

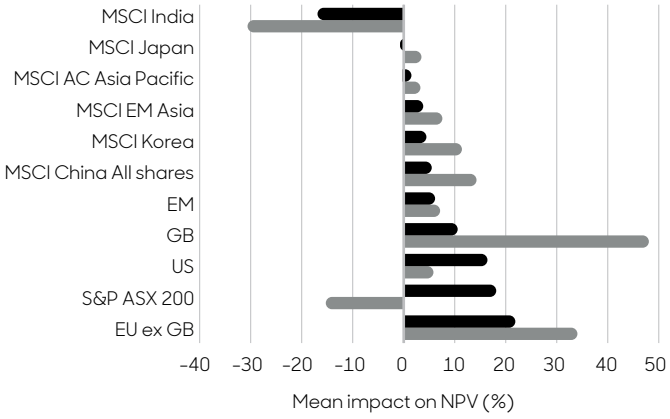
Utilities is another sector in which there is significant variation in exposures across markets (see Figure 5). In contrast to energy, long-term fair values mostly receive an uplift in our mean scenario, thanks to the way the energy transition creates a lot of additional demand through electrification.

Figure 4: The energy sector is highly negatively exposed to the energy transition in all markets



Source: abrdn/Planetrics, February 2022. Means weighted by market cap (for each index/sector).

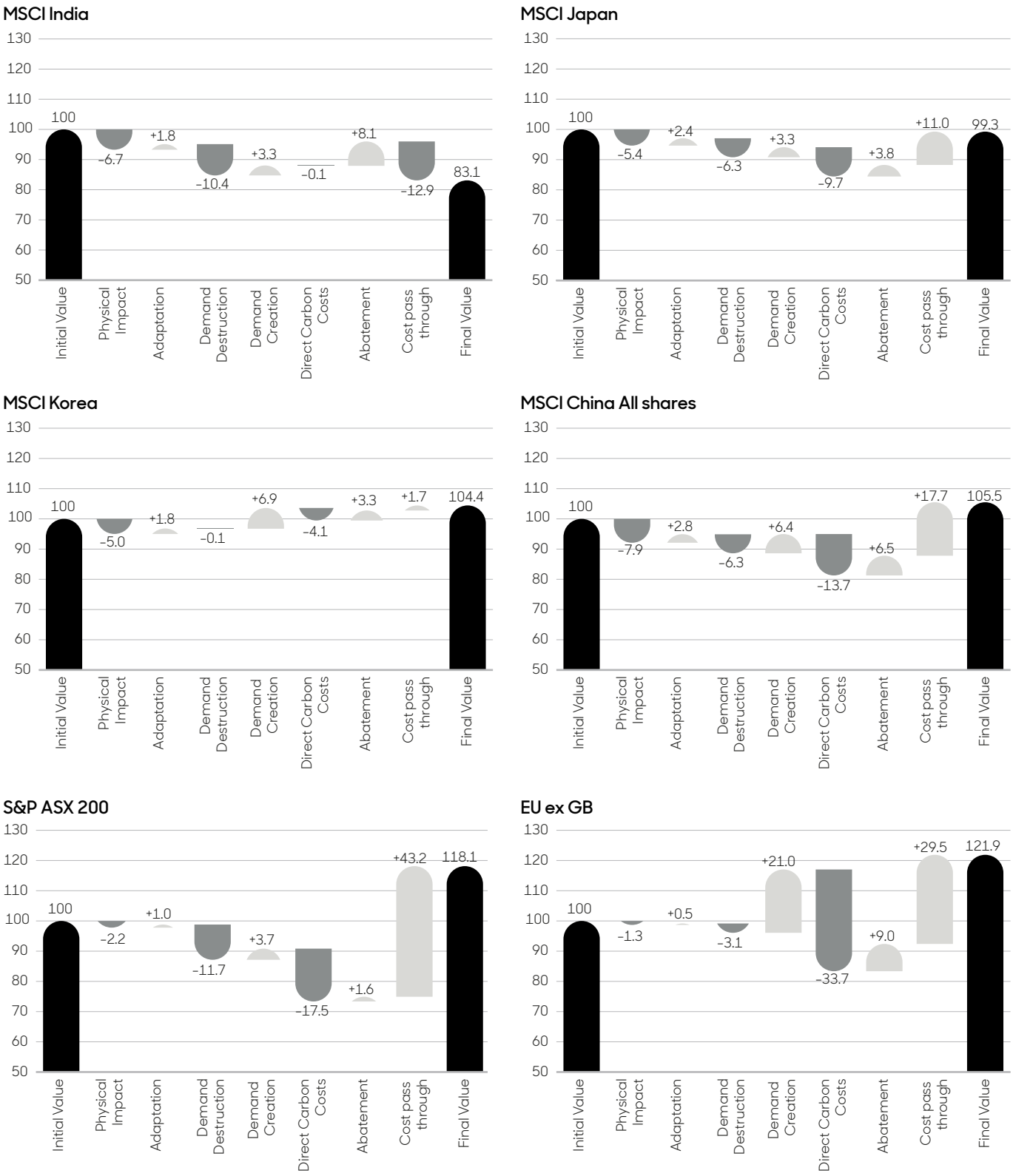
Figure 5: Utilities sector regional index valuation impairment



Source: abrdn/Planetrics, February 2022. Means weighted by market cap (for each index/sector). NB - MSCI Taiwan contains no utilities sector companies.

However, in the APAC region these benefits are smaller because policy in the power sector is expected to be less stringent and lead to slower growth in electrification (see Figure 6). There also tends to be fewer large-cap firms with significant renewable portfolios that are advantaged most by the energy transition.

Figure 6: Demand creation in the utility sector generally lower in APAC than in Europe



Source: abrdn/Planetrics analytics, February 2022. Utility sector regional indices aggregate drivers. Probability-weighted 'mean' scenario.

Indeed, in India these effects are large enough to generate a negative impairment estimate in the mean scenario. This, as well as the larger than average drag from its materials sectors, is a major contributor to the Indian index's outsized vulnerabilities.

Given the size and composition of the energy and utility sectors in the Japanese equity market, it stands out for having a surprisingly large aggregate negative exposure to our mean scenario. Instead, it suffers the largest drag across all the regional markets from its consumer discretionary sector (see Figure 7).

This is for two main reasons. First, consumer discretionary firms represent a larger weight in the Japanese index than in any other market in the region. But second, Japan's consumer discretionary sector is also exposed to the third largest drawdown of any market, with only the Korean and Indian sectors more negatively affected.

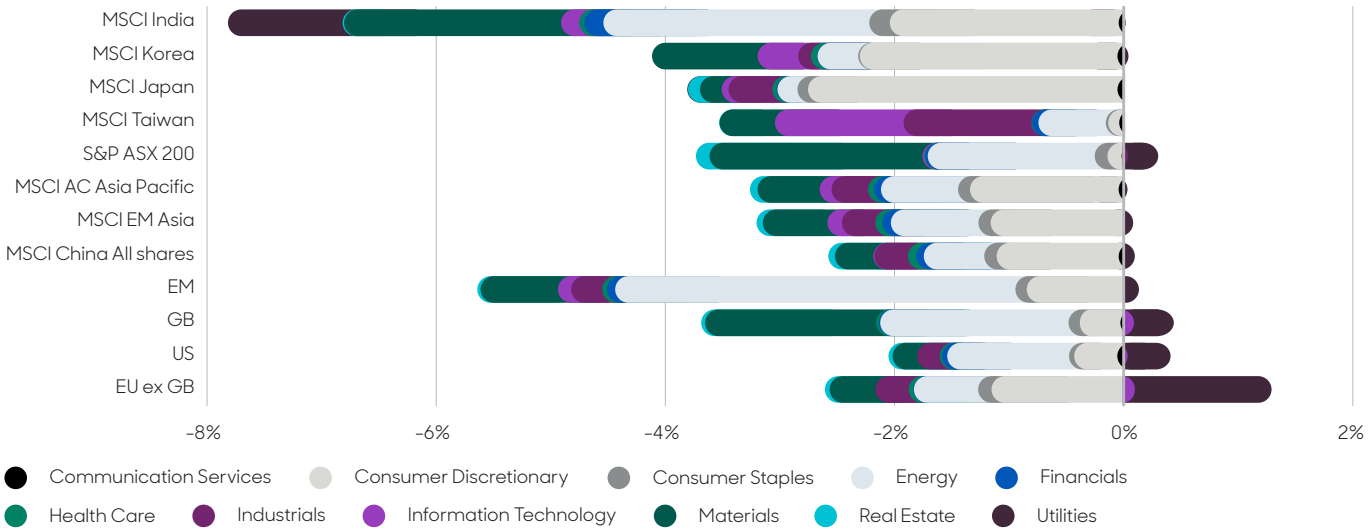
Note that the consumer discretionary sector includes traditional auto companies. These are often especially harmed in our transition scenarios because of the demand destruction associated with the decline of internal combustion engine (ICE) vehicles. However, some of these traditional firms will turn out to be winners in the rapidly expanding electrical vehicle (EV) market. Later in this paper we show how incorporating an auto company's transition strategy can make a large difference to its climate exposures.

Sector level equity exposures in Australia are concentrated in two sectors – energy and materials. In fact Australia is the only market in the region in which the materials sector is the largest drag on the fair valuation of the aggregate index. Once again, sector weighting is playing a significant role here as materials firms represent 27% of the S&P ASX 200's market capitalisation, dominated by BHP, Fortescue Metals and Rio Tinto – all of which are negatively impaired in our mean scenario.

And finally there is China. Its equities represent 41% of the total MSCI EM equities universe (52% by market cap) and 48% of the total MSCI APAC universe (52% by market cap), more than double the share of the next largest market, Japan. In what might surprise many readers given the carbon intensity of the Chinese economy, the MSCI China All Shares index has the lowest average negative exposure of all the major APAC indices in both our mean and Paris-aligned scenarios. That in turn helps to limit the exposures of the aggregate EM and APAC indices.

What explains this relatively modest exposure? Well the first contributing factor is that some of the country's most fossil fuel intensive firms are non-listed state owned enterprises. This is a timely reminder that the structure of a country's economy is often not a reliable guide to the composition and drivers of its public markets. Related to this, the energy sector has a very small weight in the aggregate index, the result of which is that the drag on valuation is smaller than for any market other than Japan.

Figure 7: Sector contributions to index level effects vary considerably across markets



Source: abrdn/Planetrics, February 2022. Means weighted by market cap (for each index).

But variation across securities within sectors still dominates

So far we have examined APAC exposures to the energy transition primarily through the lens of aggregate index and sector level effects. However, while these do differ across the major regional indices, the primary source of variation in exposures across the region is at the security level.

Take the energy sector. We know that, on average, energy is the sector most exposed to the climate transition scenarios we think are most likely. But it is still the case that 16% of the firms in the sector receive a valuation uplift in our mean scenario (see Figure 8). All but three of these are based in China.

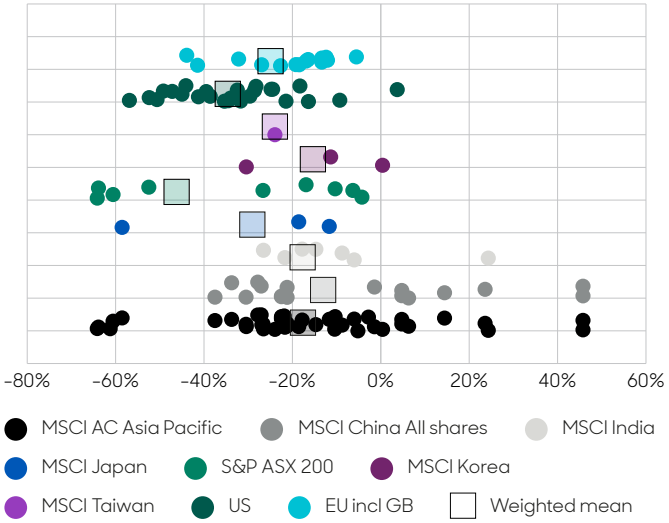
Coal producers dominate this group of Chinese firms that are escaping the estimated drawdowns of their regional peers in our 'mean' scenario (e.g. Yanzhou Coal Mining, Shaanxi Coal Industry, China Shenhua Energy). This is due to the very large uplift from demand creation they receive in scenarios based on a continuation of current policy or where new action is limited. Demand for coal remains the dominant fuel type in China under a continuation of current policy, and even in stricter and early action scenarios the projected role for coal remains a dominant feature for longer in China compared to other regions.

In addition to this, with carbon price projected to remain comparatively low in China across our scenario suite, coal producers in this region have the potential to benefit from continuing demand from other regions where high carbon price and dwindling demand will result in other coal companies exiting the market sooner. Despite the large downturn they see in net-zero and stricter action scenarios due to severe demand destruction, the uplift from low or no additional action pathways is enough to result in an overall positive uplift in the mean scenario.

Meanwhile, though the mean negative impairment is a little less than 20%, there are four firms with negative exposures close to 60%. Three of these companies are Australian and include the energy giant Santos, a company which is emblematic of the challenges facing the most exposed firms in the sector. It is the largest supplier of natural gas to the local market, primarily for use in electricity generation, cooking, heating and hot water. It is also a significant supplier to Asian markets.

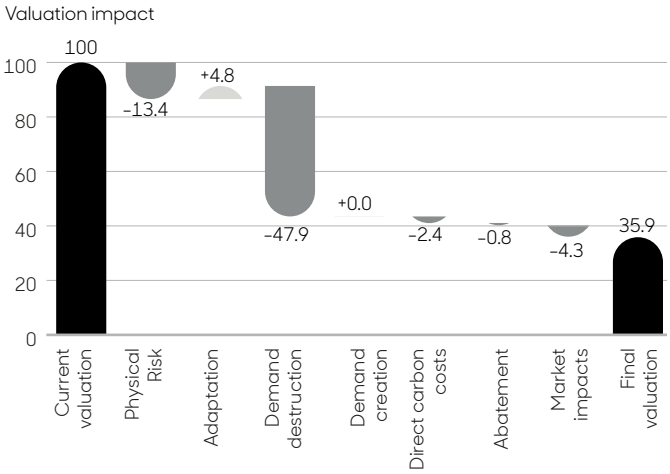
Although natural gas remains an important transition fuel in our mean scenario, our analysis implies that cumulative natural gas demand over the next three decades is likely to be significantly weaker than we believe is priced into markets today. The upshot is that Santos is exposed to significant demand destruction (see Figure 9), unless carbon capture and storage technologies become more viable, or the firm can substitute into new, low-carbon lines of production.

Figure 8: Most energy firms suffer impairment, with a few Chinese exceptions



Source: abrdn/Planetrics, February 2022; Energy sector dispersion. Probability-weighted mean scenario. Means weighted by market cap for each index/sector).

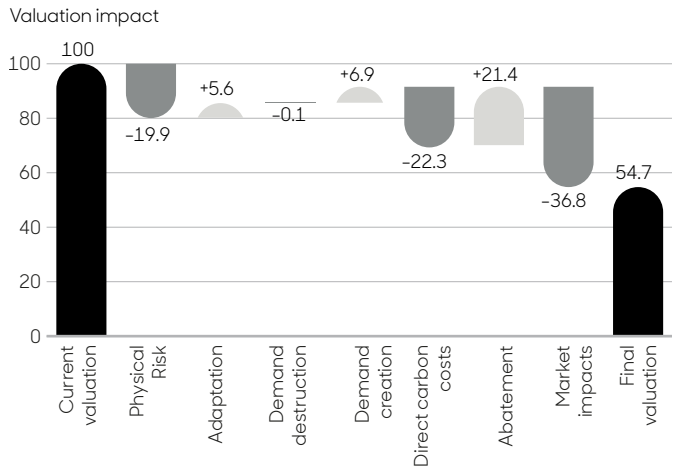
Figure 9: Drivers of estimated valuation impacts for Santos



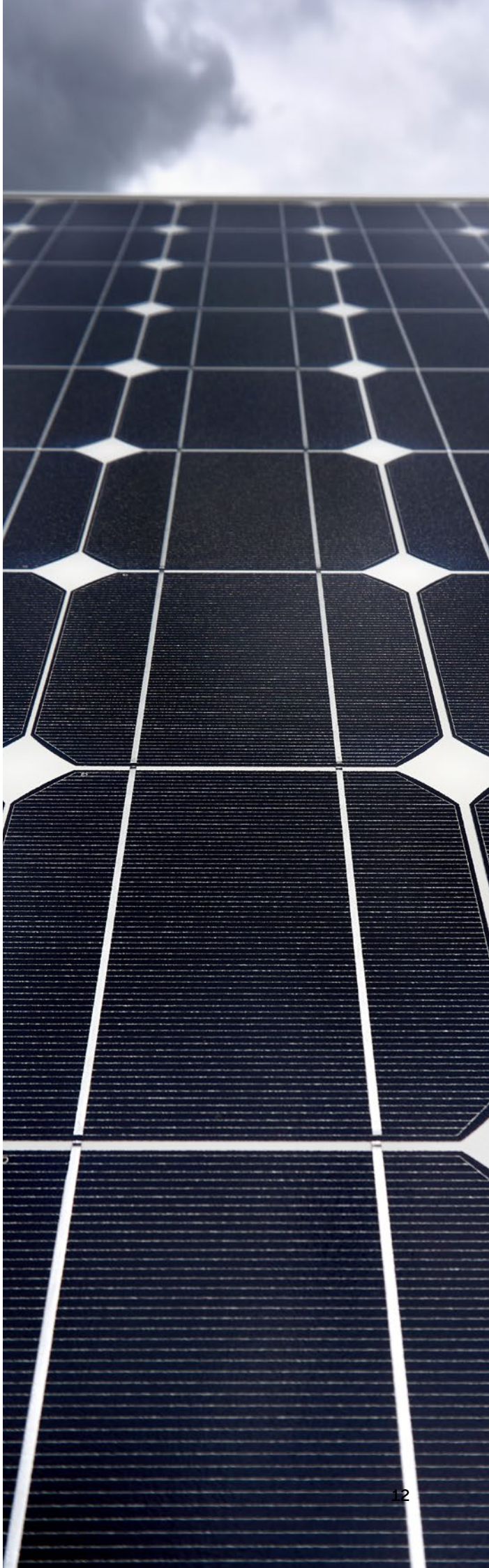
Source: abrdn/Planetrics analytics, February 2022. Probability-weighted mean scenario.

The risk for some companies in scenarios where policy is less ambitious is also highlighted by the example of the major Indian renewable utilities firm Adani Green. As a low carbon utility company operating in a market with currently very emissions-intensive competitors, they see a strong uplift in scenarios with very high carbon prices. However, in scenarios where the carbon price for the sector in that region is below baseline, or increased carbon prices are delayed, the most emissions intensive firms receive an effective subsidy. This is reflected in the large impairment in the mean scenario, in large part due to the market impact driver (see Figure 10), and contributes significantly to the impairment for the sector in India (see Figure 5), as renewables companies may not benefit from the large uplift for renewable firms in other regions with more stringent policy action and carbon pricing.

Figure 10: Drivers of estimated valuation impacts for Adani Green Energy



Source: abrdn/Planetrics analytics, February 2022. Probability-weighted 'mean' scenario.

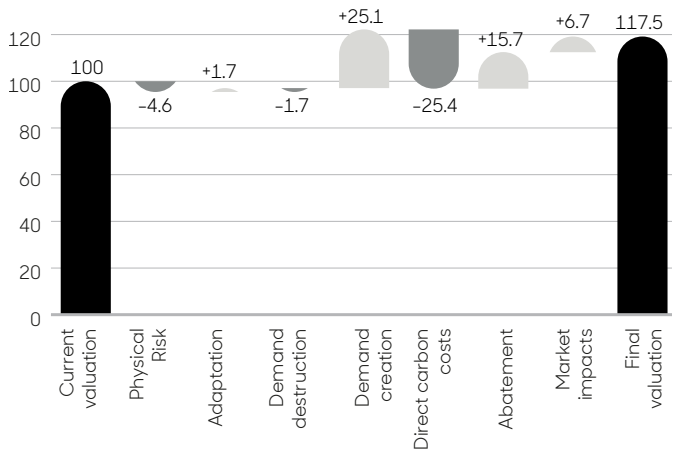


The materials sector is an even more interesting case in point. Again, like energy, the average valuation effect is negative in every APAC regional market covered in the note. However, in contrast to the energy sector, direct carbon costs via carbon pricing is the dominant driver of the negative impairments. Moreover, because the materials sector is more balanced between fossil-fuel intensive 'brown' firms and the producers of 'green materials' like copper and lithium, there are many more firms that benefit from valuation uplifts in the sector.

Once again, the Chinese market accounts for the majority of these, though they are also present in Australia, Japan and Taiwan. A good example here is Guangzhou Tinci Materials Technology. As a major producer of lithium-ion battery materials needed to meet the demand for electric vehicles and electrical energy storage solutions, it shows a significant uplift in a sector which is, on average, negatively impaired. This is largely due to the significant uplift from demand for these materials, the firm's ability to introduce abatement measures for a large portion of their direct carbon costs as well as the ability to pass some of those costs through in the market (see Figure 11).

Figure 11: Drivers of estimation valuation impacts for Guangzhou Tinci Materials Technology

Valuation impact

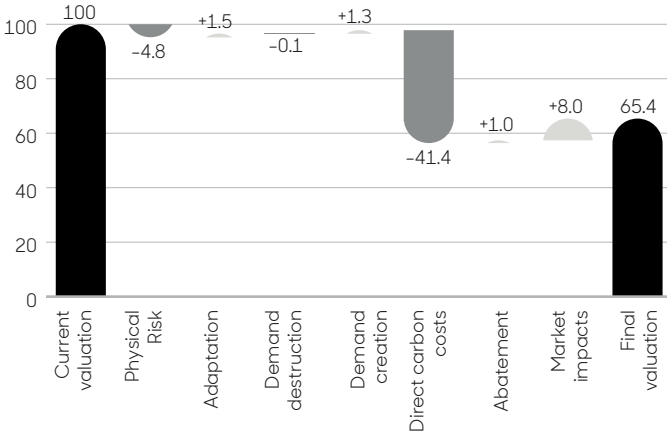


Source: abrdn/Planetrics analytics, February 2022. Probability-weighted mean scenario.

On the negative side, we unsurprisingly see that many steel and coal miners have few low-cost options for decarbonising their productions, and a limited ability to pass on higher carbon costs to end users. Tata Steel for example suffers a more than 30% impairment in our mean scenario as direct carbon prices alone subtract more than 40% from their fair value, and only a small proportion can be made up by cost pass through (see Figure 12). Naturally, the effects are even more negative in a world where temperature increases are limited to less than 2 degrees above pre-industrial levels.

Figure 12: Drivers of estimated valuation impacts for Tata Steel

Valuation impact



Source: abrdn/Planetrics analytics, February 2022. Probability-weighted mean scenario.

Accounting for transition companies

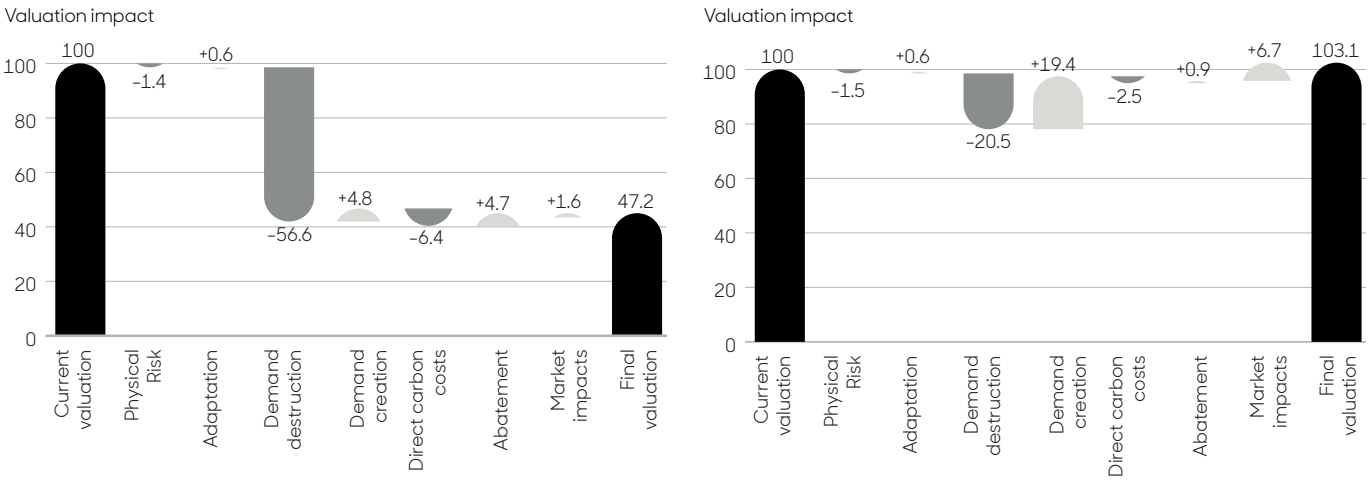
Our standard analysis, covering more than 22,000 listed firms across the world, and over 10,000 in the APAC region, has one important limitation. While the policy and technology pathways that underpin our bespoke scenarios are forward looking, actions taken by firms themselves are limited to cost effective adaptation to limit impacts from physical risk and/or measures to abate carbon costs, and the analysis does not assume a more 'dynamic' response to the changing environment. To put it differently, our standard modelling framework does not account for the potential for a company negatively exposed to the energy transition to alter its strategy and set targets that go beyond these limited actions, driven by economic or reputational risk.

In response to this limitation of the standard analysis we have been working with our partner, Planetrics, to incorporate companies' transition plans into our analysis. We will be writing a detailed paper on our approach that assigns a transition credibility score to around 390 listed companies that have fossil fuel intensive business models, have meaningful weights in their indices, and have formally announced net zero or other carbon targets.

This credibility score will take account of how detailed firms' decarbonisation targets and pathways are, whether they are operating in jurisdictions where government policy and regulations are aiding or hindering their plans, their decarbonisation track record and realised low-carbon capital expenditures, the cost and availability of the technologies that are needed to aid their transitions, and whether their transition strategies have been assessed as credible by third parties like the Transition Pathway Initiative. In doing this, the climate scenario team will be working closely with the portfolio managers of our transition focused equity and credit funds, who have already developed sophisticated processes for identifying credible firms.

To provide a flavour of how this addition to our platform can alter perceptions of risk and opportunity, Figure 13 compares our impairment estimates for Toyota under our standard assumptions (in a Net-zero 2050 scenario) and then if we assume that its transition plans to reduce absolute emissions by 100% and increase revenue share from electric vehicles (EV) to 70% by 2050 are fully implemented. Note that this is an upper bound on the

Figure 13: Valuation estimates for Toyota in our standard models (left) and including transition plans (right)

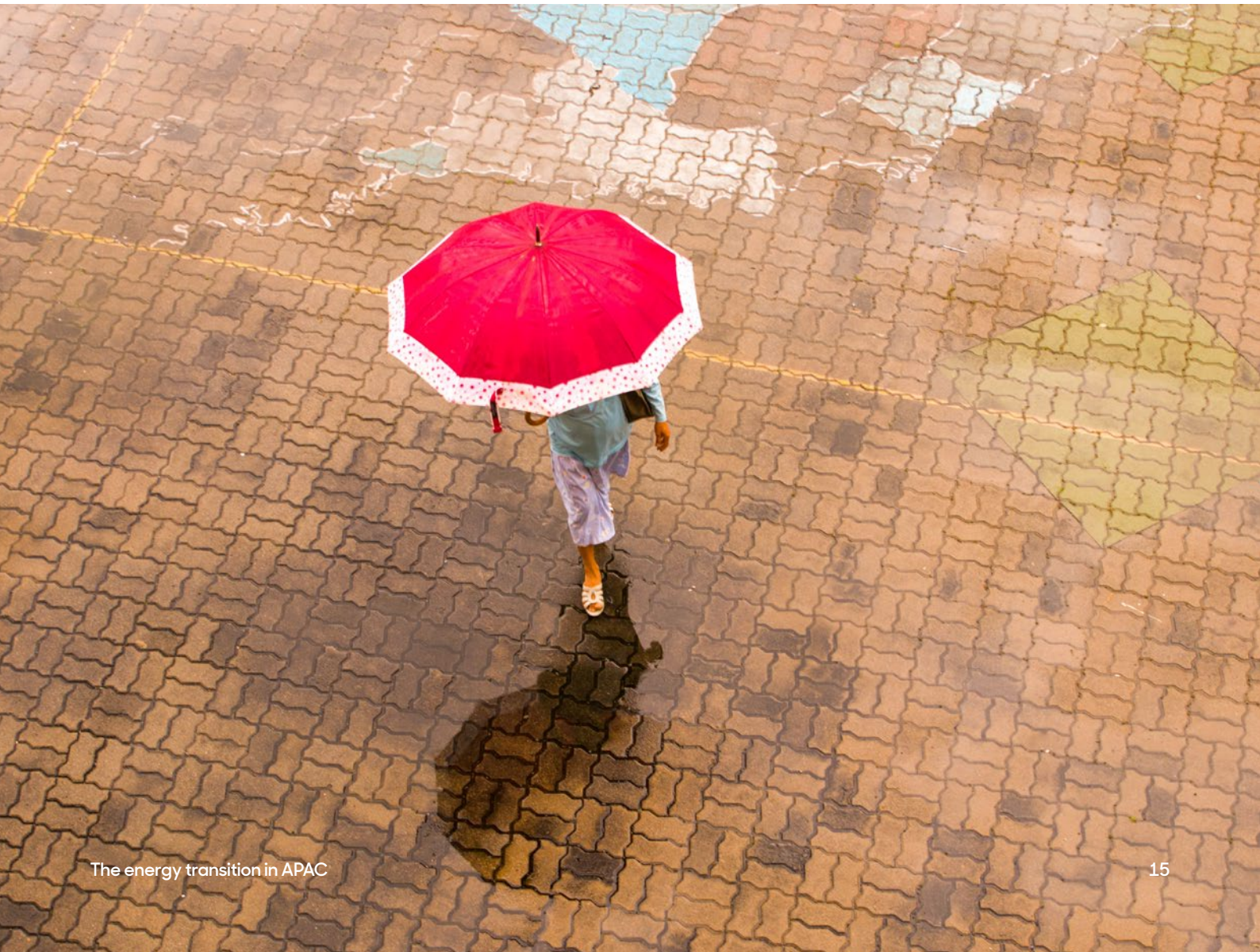


Source: abrdn/Planetrics analytics, February 2022. Net-zero 2050 scenario.

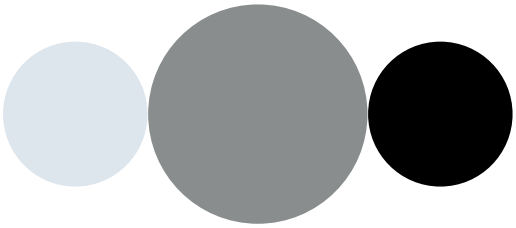
benefits to making the transition because it assumes it is the only firm in the sector to make such plans and because it treats the plans as fully credible. The Net-zero 2050 scenario is also at the high end of potential effects because of the extent and speed of the energy transition it involves.

Without considering company targets, Toyota has large valuation impairment due primarily to demand destruction for conventional autos in a net-zero scenario. However, their target to substantially increase the EV share of revenue results in much less demand destruction and greater demand creation as the effect of the large shift in production and spending patterns is neutralised. Meanwhile, the firm also sees smaller carbon costs and is able to expand its margins at the expense of peers.

While this is a very stylised example, and to repeat, is an upper bound, it does highlight the importance of complementing our standard scenario analysis with a clear view of the credibility of a company's transition strategy. This type of analysis plays a central role in our stock research and selection processes.



Creating large stock selection opportunities



More generally, the results of our climate scenario analysis provide the important, forward-looking insights investment teams need in order to robustly incorporate climate change risks and opportunities into decision-making. This in turn has allowed us to build more climate-resilient portfolios and enhance long-term investment returns.

However, it is also essential to keep in mind that these results inform rather than dictate our stock selection and portfolio construction decisions, complementing our other active sector and asset level research. Examples of where the platform provided key, complementary insights include:

- **APA Group** – an Australian natural gas infrastructure company – was identified as a 'common climate loser', at risk of material valuation impairments across all but the slowest transition scenarios (see Figure 14). The impact channel for valuation impairment was demand destruction, reflecting the risk that the market was mis-pricing future gas demand because there was excess optimism about the strength of the role of gas as a transition fuel. The company produces its own climate scenario analysis and so we compared these with our bespoke and off the shelf climate scenarios to understand the differences in assumptions and the potential valuation outcomes.
- The stock analyst incorporated this assessment into their wider research as well as their engagement program with the company. We then assessed its climate change readiness and long duration capital allocation strategy to mitigate climate risk and used these insights to inform our investment research and portfolio construction decisions. Ultimately, we took the decision to exit the stock given our view of the risk return profile.
- We had identified Chinese listed **Sungrow Power Supply** through our bottom up research process as offering attractive fundamentals as a leader in solar inverters with high margins and an early mover strategy in the energy storage systems space. This is an area we view as the next frontier in clean energy.
- Our analysis identified that Sungrow Power Supply was a 'resilient climate winner', with upside risk to the valuation compared to what the market was pricing in under both our 'mean' and Paris-aligned scenarios. We use these insights to inform our investment and portfolio construction decisions taking account of the fundamental drivers of risk and return over various time periods.
- Our analysts identified **Power Grid Corp of India** – an owner of transmission networks – as a key enabler of greater renewable penetration in India. Our analysis provided us with further insights into the potential size of the opportunity, and the likelihood that these were not reflected in market pricing. Again, this, together with our fundamental bottom up analysis informed our investment and portfolio construction decisions.

Figure 14: Illustrative summary analysis report for APA Group from our climate scenario tool

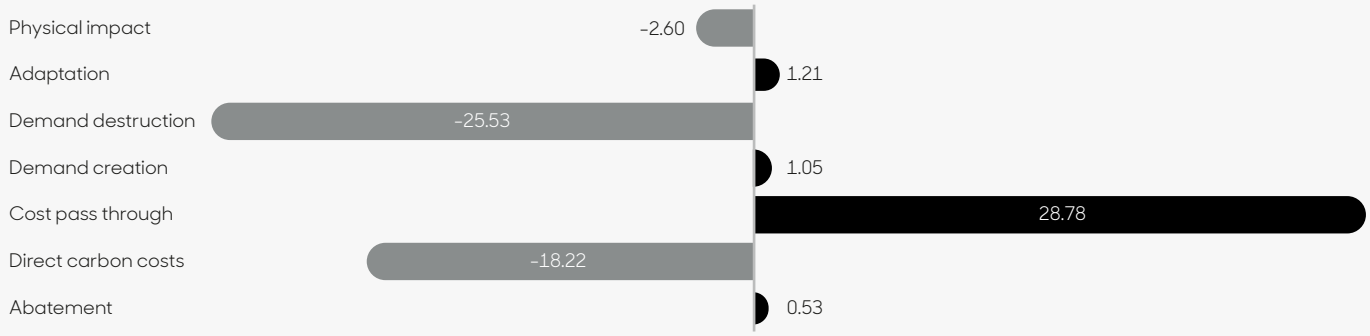
APA GROUP

Asia ex JP	**Utilities**	**47.63 %**
MX Region	Sector	EU Taxonomy

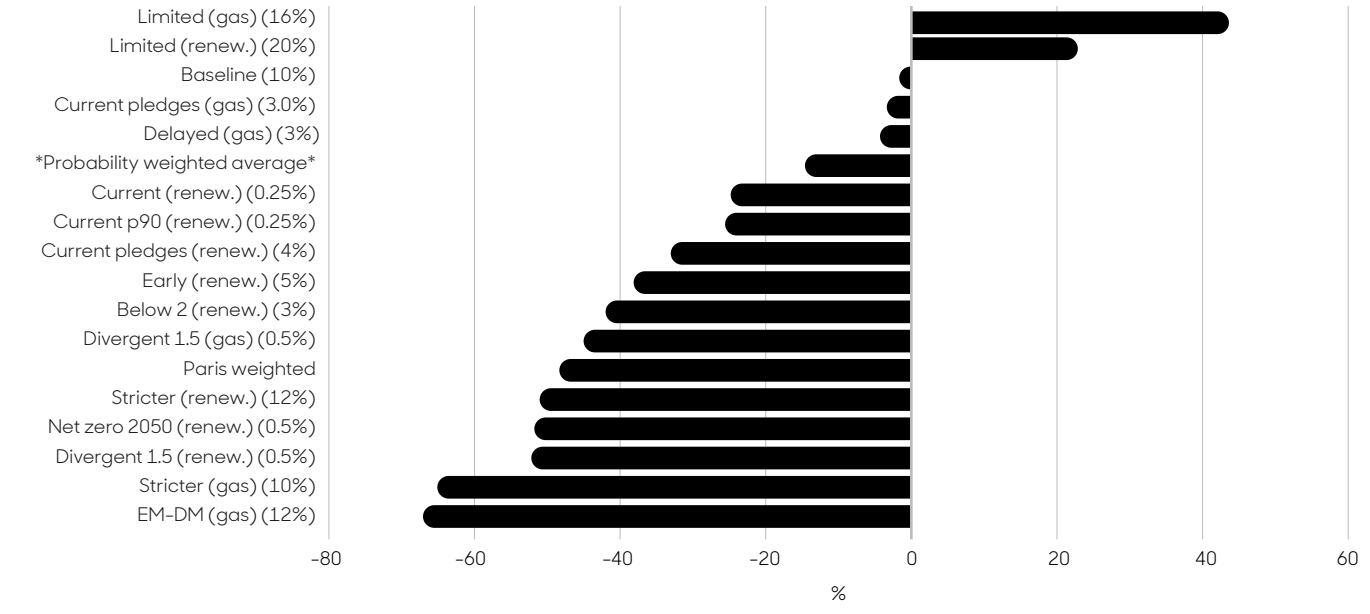
Total impact on company value

Probability weighted scenario	Paris weighted scenario	Current policy O6 Current (renew)
-14.77%	**-48.54%**	**-25.11%**
sector average 11.51 %	**sector average 19.00%**	**sector average 6.25%**

Breakdown of impact for probability weighted scenario (%)



Comparison of impact across scenarios



Conclusion

APAC is expected to be the fastest growing region in the world over the next three decades and make the largest combined contribution to the growth in energy usage. As a result it will be the most important battleground in the world's fight to decarbonise energy systems and keep global temperature increases as close to the objectives of the Paris Agreement as possible.

The APAC region is extremely diverse, with economies at vastly different stages of development, carbon intensities and climate policy settings. Capturing climate-related investment opportunities and avoiding risks requires a deep understanding of these intra-regional differences, as well as how these are likely to affect individual securities.

abrdn's climate scenario and analytics platform provides critical forward-looking insights into how APAC companies' potential climate exposures differ from one another, as well as from their counterparts in other parts of the world. This provides a strong and unique complement to our active stock research, selection, portfolio construction and engagement activities.

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