Global Asset Management

RBC Asian Equity team ESG report 2025

Contents

About this report

The term 'environmental, social and governance' ("ESG") refers to a set of factors – environmental, social and governance-related – that may be considered in investing. Environmental factors refer to how an issuer interacts with the environment, and vice versa. Examples include climate change and natural resource management. The social aspect is in relation to how an issuer interacts with its employees, customers, and communities. Examples are labour practices and community relations. Governance factors refer to how the issuer governs itself. Examples include board structure and independence, and bribery and corruption.

ESG integration refers to the ongoing incorporation of material ESG factors into investment decision making, with the aim of identifying potential risks and opportunities and improving long-term, risk-adjusted returns. Where reference is made to ESG analysis or ESG integration, this relates to equity holdings. It should be noted that certain asset types, such as cash or cash equivalents, do not integrate ESG factors.

ESG engagement refers to communication between investors and boards, management teams, or other applicable representatives of the company, as well as other stakeholder groups of relevance to the issuer. Engagement for 'insight' usually occurs in order to better understand a company's approach to material ESG risks or opportunities, where there is not necessarily any objective to encourage change.

Engagement for 'influence' is where there is an explicit objective to encourage companies to adopt better ESG practices (e.g. seeking better disclosure of material ESG risks and opportunities, or encouraging more effective management of material ESG risks, particularly where these are lagging peers) to help mitigate material ESG risks.

When discussing ESG engagement, it should be noted that a variety of engagement methods may be employed, depending on a number of different factors and considerations (e.g., depending on the issuer, the matter being discussed, the accessibility of the issuer etc.). Investment teams select the engagement method they believe to be most appropriate and effective for their desired engagement objective.

Where there is an engagement activity, this is not necessarily limited to/solely for: issuer engagement (as engagement can occur with other relevant stakeholders, such as regulators or other investors), engagement to promote change (as engaging for insight is equally important and more likely to be the case for the investment team), or occur for all applicable holdings in portfolios (as the investment team will prioritise activities to optimise for effectiveness and efficiency).

When referring to proxy voting decisions in the report, definitions for these are as follows:

For	A vote supporting an agenda item.
Against	A vote not supporting an agenda item.
Withhold	A vote not supporting an agenda item.
Abstain	A vote neither supporting nor not supporting an agenda item.
Do not vote	Not voting on an agenda item.
With management	A vote that is the same as the management recommendation for an agenda item.
Against management	A vote that is different to the management recommendation for an agenda item.
With policy	A vote that is the same as ISS's implementation of the RBC GAM Proxy Voting Guidelines.
Against policy	A vote that is different to ISS's implementation of the RBC GAM Proxy Voting Guidelines.

The outcome of an engagement is generally not the sole factor in an investment decision. Instead, the information obtained from engagements on material ESG factors helps inform the investment case.

The data used in the ESG analysis throughout the report is based on portfolio holdings of the applicable strategies over the 12 months to 31 March 2025, unless stated otherwise. It covers equity investments in the portfolio, excluding cash or cash equivalent positions (which typically comprise <5% of total portfolio assets under management).

Reference to specific ESG metrics are those which are either internally derived from a proprietary methodology of the Asian equity investment team (further details on the methodology are available on request) or have been sourced from external ESG data providers (resources for further details on the methodology are provided where these are publicly available, otherwise, they are available on request).

Where ESG metrics have been sourced externally, these either relate to ESG ratings or scores generated in aggregate or to specific ESG issuers (e.g. from MSCI, Sustainalytics), including analysis of factors such as corporate governance (e.g. from ISS), ESG controversies (e.g. from MSCI, Sustainalytics), international social norms (e.g. MSCI), or accounting practices (e.g. from GMT, HOLT Risk).

Where investments are profiled, these will have been held (or may remain holdings) at some point during the reference period. The information provided is to illustrate the investment process of the strategies and should not be deemed a recommendation to buy or sell any security or financial instrument.

Foreword

The return to the White House of Donald Trump and the frantic pace of the new administration's policy efforts have made equity markets extremely challenging so far in 2025.

The very term 'ESG' has been caught up in culture wars, particularly in the US. With the challenges of energy supply in Europe post the Russian invasion of Ukraine, as well as the escalating trade wars, there have been serious questions asked about key orthodoxy, which pertains to investors' understanding of what ESG means.

Where does the aim of decarbonisation fit in with the challenges we are facing due to fast changing supplies of energy? How should investors think about capital allocation to defence names, when the spectre of an aggressive threat to the West clearly exists, and considering the Trump administration's views on defence partners' (lack of) spending? There is clearly a blurring of lines on many levels.

Our Asian Equity team has avoided being overly prescriptive in its take on ESG. Ultimately, we have always considered this as a risk metric/analysis point for all our holdings (both actual and potential) as opposed to trying to find the "best" ESG investments. Our key aim is to reduce and minimise the risk – either temporarily or permanently – to client capital from getting our assessment of a specific company's ESG metrics wrong. We feel that this strategy is particularly appropriate in Asia.

China provides many opportunities and risks from an ESG perspective, from often-concerning labour practices to the fact that the country is leading the global transition to a 'green economy'[1], leveraging on its enormous economies of scale (as well as allegedly large subsidies that have caused its key trading partners to become concerned). This in itself has put China at odds with many other economies and provides us with food for thought when investing there.

> **"Our Asian Equity team has avoided being overly prescriptive in its take on ESG."**

Perhaps the most compelling opportunity in the next few years remains in improved management governance for Asian corporates. While still relatively slow, the experience of Japan has helped push Korean corporates to improve practices – and while this has been a case of a process interrupted by a coup/presidential impeachment – this provides us with continued positive change in Asia.

We recognise that we must continue to refine and improve upon our existing processes, which we believe will add value to investing in the region. We hope you enjoy the insights into our ESG activities in this report and we welcome any feedback.

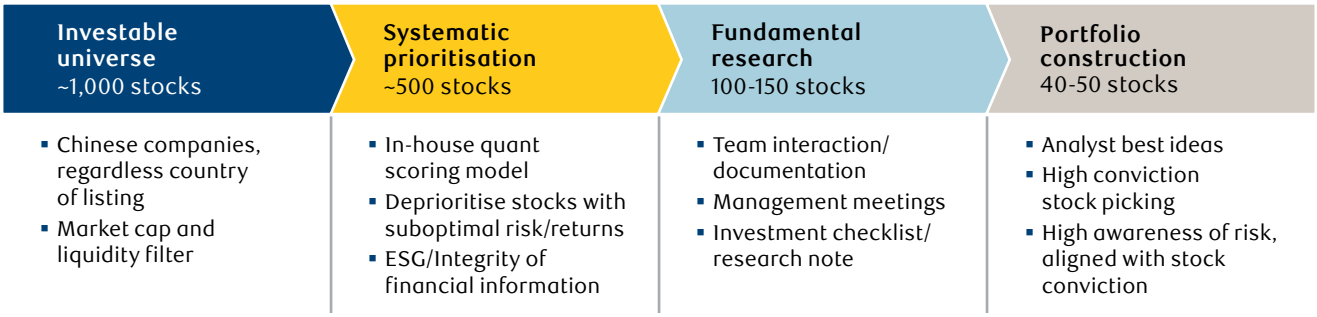
[1] weforum.org/stories/2025/01/why-china-matters-to-the-worlds-green-transition/.

Our approach to ESG

We have considered material ESG issues since our track record began in 2014. ESG factors form an important part of our fundamental, active investment management process.

We believe that incorporating these factors into our process allows for a more robust risk assessment, and ultimately helps us to unearth high quality, stable business models that can succeed over the long-term.

Figure 1: Our investment process



Source: RBC GAM, as at April 2025. This refers to ESG integration/analysis and relates to equity holdings. Certain asset types, such as cash or cash equivalents, do not integrate ESG factors.

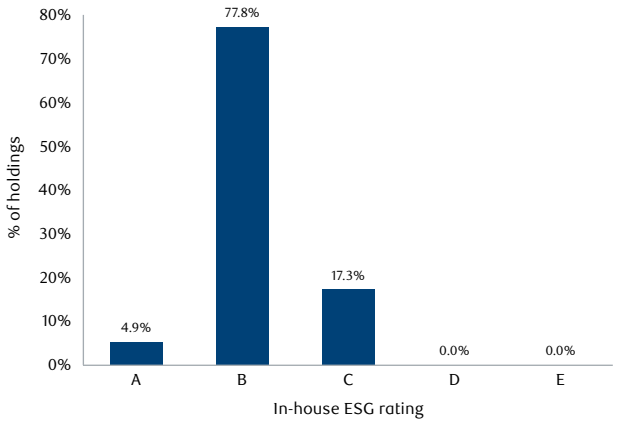
As Figure 1 illustrates, we leverage our in-house quantitative scoring model to allow us to deprioritise stocks with suboptimal risk-adjusted returns. This model incorporates various accounting ratios and third-party ESG data sources alongside fundamental factors, adding focus and depth to our fundamental research as we deprioritise companies with unsustainable business practices.

Our subsequent fundamental research, conducted by the responsible specialist, includes explicit and in-depth consideration of ESG factors. During this phase, ESG materiality becomes an important concern as we meet with management to discuss key ESG issues specific to each business. Materiality is assessed based on multiple factors including a company's operations, industry size, geographical footprint, and the nature of the investment vehicle for which it is being purchased.

The relevance of particular ESG issues vary from industry to industry, or country to country, making bottom-up company research the most effective way to understand the opportunities and risks facing each business. Within our team, the organisation of research coverage supports analysts in acting as specialists in their respective fields, allowing for a better understanding of key ESG controversies within each sub-sector or market.

We summarise our overall ESG view in an in-house checklist, which is then translated into an ESG score from A-E. To be considered for investment, companies must score a rating of C or above (Figure 2). Various sources feed this checklist, including third-party research providers, however with ESG disclosure amongst Asian markets being below global levels, our fundamental research and information obtained directly from issuers are central to our overall assessment of a company. This, along with other key insights in the form of research notes, is shared and discussed with the broader team.

Figure 2: In-house ESG ratings for RBC Asian Equity strategy holdings



Source: RBC GAM, as at 31 March 2025. A total of 185 companies are held across RBC Asia Pacific ex-Japan strategy, RBC Japan Equity strategy and RBC China Equity strategy.

Figure 3: ESG is key to our fundamental, active investment management

	Quantitative	Qualitative	Beyond[2]
Key activities	▪ Proprietary quant process/tools ▪ Accounting quality screens ▪ In-house audit/quant specialists ▪ 3rd party data/research (GMT, MSCI ESG, Sustainalytics, HOLT Risk)[1]	▪ In-house research note and investment checklist with ESG rating ▪ 3rd party data specialising in ESG e.g. past several years of company's litigations or media coverage	▪ Company meetings/calls firsthand ▪ On-the-ground channel checks ▪ Sector specialist team structure/ discussions ▪ Interviews e.g. industry experts, regulators, competitors, local investors
Outcomes	▪ Integrity of financial information ▪ Sustainability of cash flows	▪ Holistic, thorough, consistent process ▪ Long-term view	▪ Industry/company specific ESG perspective

Entire investment process. Each and every investment team member

Source: RBC GAM, as at April 2025.
[1] MSCI ESG and Sustainalytics are third party ESG vendors. GMT and HOLT provide analysis on accounting practices.
[2] Refers to communication between investors and the boards, management teams, or other applicable representatives of the company, as well as other stakeholder groups of relevance to the company. The outcome of an engagement is generally not the sole factor in an investment decision. Instead, the information obtained from engagements on material ESG factors helps inform the investment case. Further details available within this document.

The team's common culture of ESG awareness allows our investment views to be more holistic, thorough and long-term in nature, characteristics that align with our overall investment philosophy. This approach positions us well to build a high conviction portfolio of companies with high quality management teams, strong corporate governance, and durable business models. When it comes to portfolio construction, ESG risk forms a key consideration when evaluating overall portfolio risk.

To illustrate tangibly how ESG is integrated throughout our process, Figure 3 provides detailed examples of our key activities and outcomes.

Our ESG review of investee companies is an iterative process and continues throughout the holding period. We work to cultivate in-depth and ongoing dialogues and to establish long-term relationships with management teams, and seek to understand how a company is approaching material ESG issues. We convey our views through proxy voting and engagement and believe that, over time, our interactions can lead to positive change.

Proxy voting

As an asset manager, we act in the best interests of the portfolios we manage. This includes exercising the voting rights attached to securities we hold, where we have such authority. We exercise these rights of the portfolios we manage in their best interests and with a view to enhancing the long-term value of the securities held. In Asian markets, we utilise the local proxy voting policies of Institutional Shareholder Services (ISS), but we make our voting decisions independently. Our voting records are publicly available on the RBC GAM website.

Engagement

We engage with all our investee companies and, where practical and possible, engagement on ESG practices is preferred over divestment. We conduct a significant number of in-person company meetings and calls every year where we discuss ESG matters directly with company management. During these meetings, we raise material ESG-related concerns, so we can better understand how a company is approaching these risks and opportunities. We also conduct channel checks and consult our industry experts to help ensure we have a holistic and unbiased view of the companies we invest in. Our sector specialist team structure allows our sector analysts to consider ESG within a broader industry context.

Summary

We consider material ESG factors throughout our investment process, facilitating robust risk and reward assessments of each stock we consider, and of the portfolio as a whole. At the same time, we are conscious that ESG considerations form a broad and expanding landscape, and we are constantly seeking to evolve and improve our practices to refine our approach. We hold ourselves highly accountable, and through continuous learning we believe our rigorous process supports our aim of finding great businesses led by reliable management that can outpace market expectations.

Proxy voting

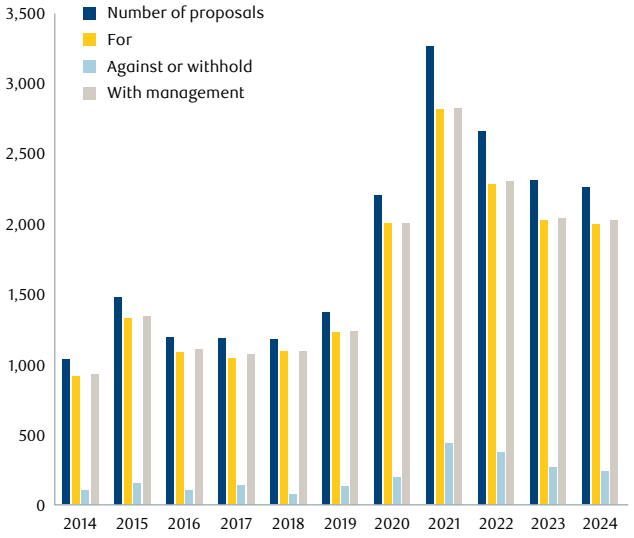
The team approaches the proxy voting process with due consideration, exercising our voting rights as part of our active ownership approach and our fiduciary duty. We believe that proxy voting provides an important way for us to convey our views to company boards and management teams, offering an opportunity to escalate concerns where required.

As a team, we benefit from the support and expertise of RBC GAM's Responsible Investment (RI) team and work closely with them throughout the proxy voting process. The RI team has developed a set of custom proxy voting guidelines (RBC GAM: Proxy Voting Guidelines) that outline our views as a firm on corporate governance best practices. These guidelines support the process, offering guidance on how to vote on particular issues.

In Asian markets where the guidelines do not apply, we receive voting recommendations from a proxy advisor: ISS. This offers important insight, but each vote is still carefully reviewed internally, utilising data from research firms as well as our own assessment of company specific circumstances to help inform our decisions.

Figure 4 highlights our team's voting history. Since 2014, we have participated in 19,960 proposals, voting 89.3% of these in accordance with management recommendations. Our decision to invest in a company reflects, at least in part, our confidence in its management, and is why we often support management on routine matters.

Figure 4: RBC Asian Equity team voting history (2014-2024)



Source: RBC GAM, as at January 2025. From 2014-2019, this reflects combined voting data from RBC Asia Pacific ex-Japan Equity strategy and RBC Japanese Equity strategy. From 2020-2024, this reflects combined voting data from RBC Asia Pacific ex-Japan Equity strategy, RBC Japanese Equity strategy and RBC China Equity strategy.

Figure 5 illustrates our voting patterns across various categories. Whilst we predominantly align with management recommendations, we will not hesitate to withhold our support or oppose management if we believe that it is in the best interests of shareholders and our clients to do so.

Figure 5: RBC Asian Equity proxy voting proposal categories since inception (2014-2024)

Proposal category	Number of proposals	With management	Against management	Against management (%)
Elect director	8,840	8,301	539	6%
Approve auditors and their remuneration / ratify auditors	706	694	8	1%
Appoint internal statutory auditors	533	480	53	10%
Approve remuneration of directors	420	358	62	15%
Approve issuance of warrants / convertible debentures	222	219	3	1%
Approve issuance of shares for a private placement	189	161	28	15%
Approve issuance of equity without pre-emptive rights	187	59	128	68%
Approve remuneration policy or report	169	147	22	13%

Source: RBC GAM, as at January 2025. Figures reflect combined voting data from RBC Asia Pacific ex-Japan strategy, RBC Japanese Equity strategy and RBC China Equity strategy. Only key proposal categories have been listed for clarity purposes.

Company case studies

Bharat Electronics

In 2021, the European Union ("EU") put into place a transparency framework, the Sustainable Finance Disclosure Regulation ("SFDR"). It aimed to help investors make informed choices when supporting sustainability objectives, using formalised systems of sustainability disclosure. Principal Adverse Impacts on Sustainability Factors ("PAIs") are one way that SFDR aims to inform investors, covering a wide range of environmental- and social-related indicators.

We consider multiple PAIs as part of the investment process for our products and operate an integrated escalation process (Figure 6). Issuer ESG metrics are reviewed regularly, and if the value for an issuer metric is beyond an acceptable level, we must act to mitigate the impact of the PAI. This may consist of enhanced due diligence on the issue, issuer engagement, proxy voting action, or divesting.

Figure 6: PAI indicators that RBC BlueBay monitors and reports

Scope	Mandatory/ Voluntary	Theme	Indicator
Companies	Mandatory	Greenhouse gas emissions	1. GHG emissions (Scope 1, 2, 3, & total emissions)
			2. Carbon footprint
			3. GHG intensity of investee companies
			4. Exposure to companies active in the fossil fuel sector
			5. Share of non-renewable energy consumption & production
			6. Energy consumption intensity per high impact climate sector
		Biodiversity	7. Activities negatively affecting biodiversity-sensitive areas
		Water	8. Emissions to water
		Waste	9. Hazardous waste and radioactive waste ratio
		Social and employee matters	10. Violations of UN Global Compact principles and OECD Guidelines for Multinationals
			11. Lack of processes and compliance mechanisms to monitor compliance with the UN Global Compact principles and OECD guidelines for Multinational Enterprises
			12. Unadjusted gender gap
			13. Board gender diversity
			14. Exposure to controversial weapons (anti-personnel mines, cluster munitions, chemical weapons and biological weapons)
	Voluntary	Emissions	4. Investments in companies without carbon emission reduction initiatives
		Anti-corruption and anti-bribery	5. Lack of anti-corruption and anti-bribery policies
Sovereigns and supranationals	Mandatory	Environmental	15. GHG intensity
		Social	16. Investee countries subject to social violations
	Voluntary	Environmental	17. Share of bonds not certified as green under a future EU act setting up an EU Green Bond Standard
		Social	21. Average corruption score

Source: RBC BlueBay PAI statement, as April 2025.

One of the PAIs that we consider is exposure to controversial weapons. This measures the share of investments we hold in investee companies that are involved in the manufacture or selling of anti-personnel mines, cluster munitions, chemical weapons, and biological weapons. No RBC GAM investment team will knowingly invest in companies associated with these.

> **"Issuer ESG metrics are reviewed regularly, and if the value for an issuer metric is beyond an acceptable level, we must act to mitigate the impact of the PAI."**

MSCI ESG Research ("MSCI") and Morningstar Sustainalytics provide the data required to analyse potential involvement, and MSCI data points provide important context in the escalation process. If any involvement is identified, that issuer is escalated to the investment team.

During our investment analysis on Bharat Electronics, neither MSCI nor Sustainalytics indicated that the company had any connection with the controversial weapons considered. After investing, we became aware of other controversial weapons involvement through research conducted by ISS ETHIX, which indicated Bharat Electronics' involvement in the manufacture of key components of cluster munition warheads and triggered a due diligence response from our team.

We subsequently moved ahead with our own due diligence on the company, trying to break down the reasons that ISS had made the controversial weapons flag. We made direct enquiries with Bharat, and even asked an Indian expert to follow up with the company directly.

Following this period of research, we concluded that Bharat's primary focus is on the development and production of defence systems. However, there remained a risk that its products could be used for controversial weapons manufacturing and, as such, we decided to divest our position.

This example highlights the issue of variations in reported information between different data vendors, and the fluctuating perceptions of truth that this can cause. Data vendors must rely on public information for their reporting. However, small details of the products an issuer manufactures, or their end use case, often remain private.

Public information may only be available via a third-party unrelated to the issuer and claiming to have information regarding said issuer's practice. It is then up to the data vendor to decide whether that information is material or not. If there is no response from the issuer one way or the other, a data vendor could make this decision based on incomplete information. This ultimately has a material impact on the ability of their clients to invest. In these situations, the truth is determined by the vendor.

"We have integrated ESG considerations into our approach since inception, using information from third-party ESG ratings providers as part of a broad internal proprietary assessment process."

This shows the value of an integrated, internal ESG assessment process. While third-party ESG ratings can provide a good surface level impression of an issuer's ESG credentials, this case shows that there is often more nuance to ESG assessment than it might seem. This is why we have integrated ESG considerations into our approach since inception, using information from third-party ESG ratings providers as part of a broad internal proprietary assessment process.

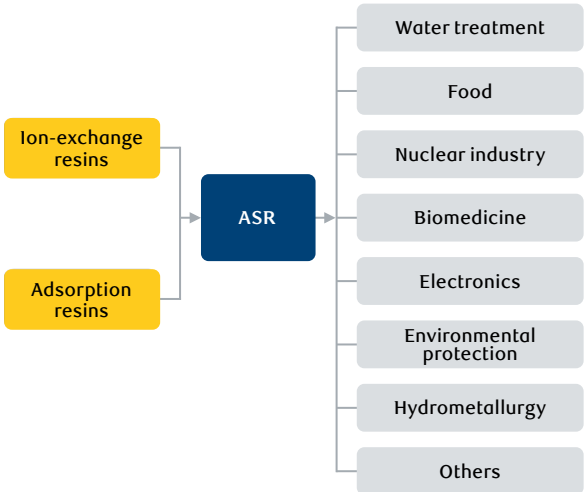
Sunresin

Sunresin is China's leading producer of adsorption separation resin ("ASR")[2], offering a full range of products for lithium extraction, water treatment, electronics, biotech, and environmental protection. In the past, the ASR market has been monopolised by overseas chemical giants, but Sunresin is gradually closing the technology gap. The company's competitive advantage is its combined material and equipment platform for industrial clients, offering an end-to-end solution.

With regards to the firm's business model, we believe Sunresin is an attractive prospect given its strong growth potential. The resin market is expanding and Sunresin is gaining global market share, currently estimated at 13% as of 2024[3]. We see strong growth prospects and market share gains in biotech, water treatment, and lithium extraction. One of our concerns when studying the company was its lack of ESG disclosures, and specifically, the lack of an ESG annual report.

To address this concern, we engaged with management and voiced our concerns over their limited disclosures. We highlighted to management that an ESG annual report would be an opportunity for the company to improve reporting for the non-financial metrics that ESG covers. This could help to improve stakeholder confidence in Sunresin's ability to deliver on strategy and ESG commitments.

Figure 7: Applications for adsorption separation resin:



Source: Sunresin, RBC GAM, as at April 2025.

Following a period of repeated engagement, we were successful in advising Sunresin of our belief in the importance of transparency around ESG. Subsequently in June 2024, the firm published its first full ESG report. In terms of environmental impact, this report displayed some useful metrics on energy consumption, greenhouse gas emissions, water usage, and hydrocarbon emissions. The report also highlighted existing investments in research and development aimed at reducing emissions and pollutants in its production process.

From a social perspective, the company highlighted customer satisfaction data, employee development plans, and employee compensation schemes. The governance section focused on the makeup of the firm's directorship. The company highlighted that there are three independent directors out of nine members on the Board, and three out of the nine directors are female.

This ESG report is a positive initial step. We believe that Sunresin can improve on the report by either providing targets or further disclosure on GHG emissions, targets on pollutant emissions, and targets on increased use of renewable energy. We will continue to engage with the company to encourage it to provide consistent and high-quality ESG disclosure.

[2,3] HSBC, January 2024.

Mitsui Fudosan

Mitsui Fudosan is one of the largest diversified real estate developers in Japan. The company focuses on leasing, property sales, property management, and facility operations. Its main business is in the development of downtown office buildings (primarily in Nihonbashi) and suburban retail facilities. Overseas business accounts for circa 15% of revenue and is seen as a core growth driver. In the strategy, this is a long-term holding, and we have consistently engaged with internal stakeholders on their medium-term plan.

Mitsui Fudosan has built a portfolio of strategic shareholdings over time. These positions, known as cross-holdings, occur when one publicly traded company holds a significant position in another. We believe companies should unwind cross-shareholdings due to concerns over capital efficiency and conflicts of interest.

Cross-shareholdings can hinder capital efficiency as they often lead to agency conflicts, inefficient capital allocation, and a lack of innovation and growth. Agency conflicts refer to situations where the interests of the cross-holding company may not align with the interests of the other shareholders of said company. This can lead to decisions that benefit the cross-holding group at the expense of the other shareholders, such as inflated valuations or less aggressive investment in growth opportunities.

Inefficient allocation of capital might arise through the diversion of resources to less productive ventures or projects that benefit the controlling interests rather than maximising overall value. Cross-holding groups can sometimes stifle innovation and growth, as companies may be less likely to pursue external partnerships. They might take risks that could potentially benefit other stakeholders, but might not align with the interests of the controlling shareholders.

“We believe companies should unwind cross-shareholdings due to concerns over capital efficiency and conflicts of interest.”

The presence of affiliated outsiders on the Board may lead to a conflict of interest between the strategic investor and other minority shareholders, where the independent director may prioritise the commercial interest of the strategic investor over other minority shareholders.

In March 2023, the Tokyo Stock Exchange (“TSE”) requested that all listed companies on its prime and standard markets take action to implement management that is conscious of cost of capital and stock price. After an initially slow response to the TSE’s request, the pace of action accelerated in January 2024. That is when the TSE began reporting a list of companies that had disclosed information in accordance with the request.

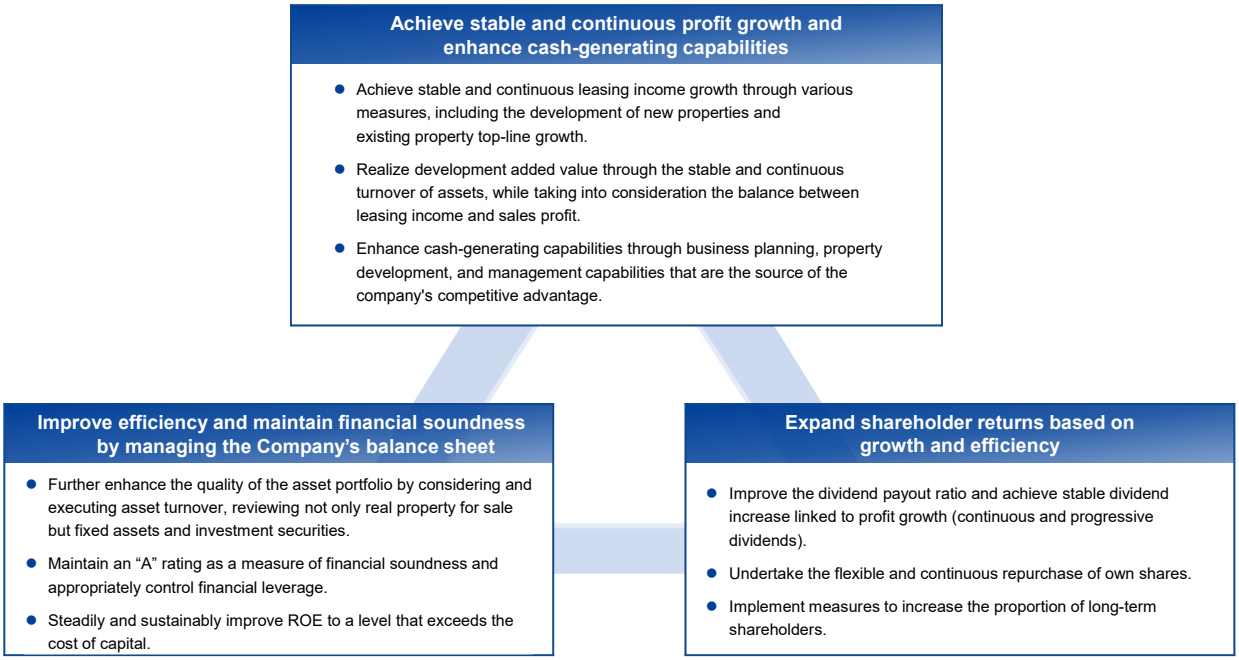
Mitsui Fudosan has taken this advice on board. The company has committed to improving return on equity ("RoE") from 7% in FY2024 to 10% by FY2030[4]. The company has also promised to reduce its strategic shareholdings by 50% between FY2024-2026 and then continually thereafter. On shareholder returns, the company looks to provide stable dividend increases linked to sustainable profitable growth (Figure 8).

These commitments demonstrate a positive intent to meet the expectations of shareholders and investors by steadily growing their earnings per share, improving efficiency, raising the total payout return ratio, and continuing to pay progressive dividends in order to maximise shareholder value.

"These commitments demonstrate a positive intent to meet the expectations of shareholders and investors by steadily growing their earnings per share."

We meet with companies like Mitsui Fudosan on a regular basis and believe that engagement through direct interaction and open dialogue is an important tool to drive positive change and address governance issues.

Figure 8: An equal focus on three key objectives: enhance growth, efficiency, and shareholder returns



Source: Mitsui Fudosan, as at April 2024.

[4] mitsuifudosan.co.jp/english/corporate/ir/library/integratedreport/ir2024/cfo/.

Country level ESG assessment

This section of the report focuses on country level ESG factors. Companies are affected by the environment of the countries in which they operate. We believe that countries with improving or high ESG scores are more likely to deliver sustainable growth compared to countries with falling or low scores. In this section, we track changes in ESG performance measured by independent third-party providers.

Methodology

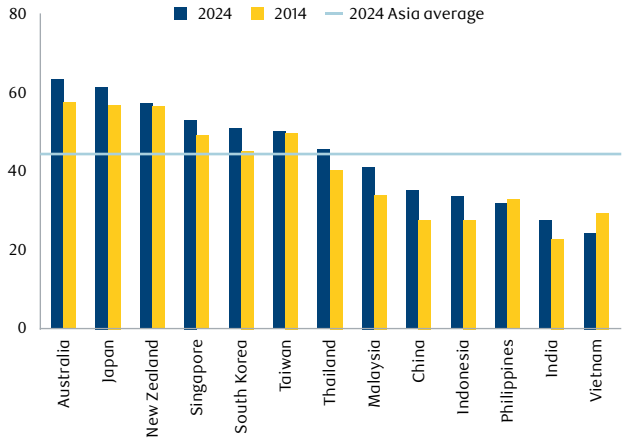
For the environmental factor, we use Yale University's Environmental Performance Index ("EPI")[5]. Using 58 performance indicators across 11 issue categories, the EPI ranks 180 countries on climate change performance, environmental health, and ecosystem vitality.

For the social factor, we use Freedom House's Freedom in the World Index ("FWI")[6]. FWI evaluates the state of freedom based on two subcategories: political rights and civil liberties. Each country is assigned a score between zero to four points across 25 indicators, for a potential total score of 100.

For country governance, we use Transparency International's Corruption Perceptions Index ("CPI")[7]. The CPI draws on at least three and up to 13 surveys and expert assessments to measure public sector corruption in around 180 countries and territories, giving each a score from zero (highly corrupt) to 100 (very clean).

Environmental

Figure 9: Asia's EPI by country (out of 100)



Source: Yale University EPI, as at 2025.

[5] epi.yale.edu/.
[6] freedomhouse.org/report/freedom-world.
[7] transparency.org/en/cpi/2022.

Observations

The average EPI in Asia was 44.3 in 2024, an increase over the 2014 average of 40.8 (Figure 9). Overall, Asia had a lower EPI score than the global average of 46.9, which increased over the 2014 global average of 44.5.

Unsurprisingly, the more developed countries in Asia have a higher environmental score, as they are financially able to address their environmental footprint. It is positive to see that most developing countries in Asia have shown progress, notably India which had made little progress in the ten years to 2024. Exceptions were Vietnam and the Philippines, which both regressed.

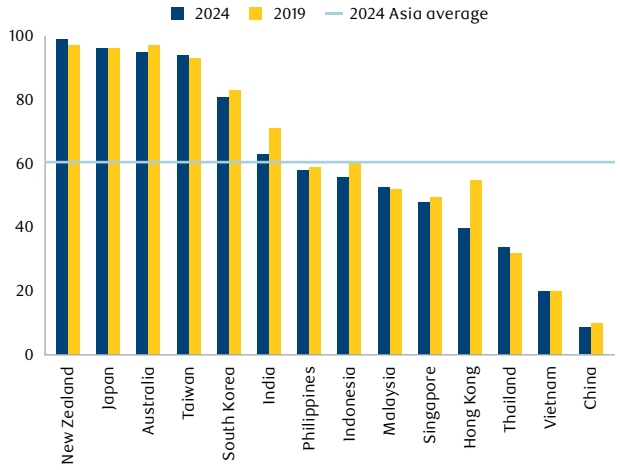
The countries with the most significant improvements include China, Malaysia, and Indonesia. China has contributed to improvements in global warming and air quality, by reducing its black carbon emissions. Indonesia and Malaysia have helped to slow the decline in biodiversity and improve carbon capture by keeping their losses of primary forests at record lows.

Vietnam was the only country showing notable regression within Asia. Over the last decade, the country's coal usage has nearly tripled as its economy expanded rapidly, especially in the industrial sector. Severe drought and heatwaves have affected Vietnam's ability to generate hydro-electric power. The country also scored poorly on climate change, with high growth of greenhouse gases.

Vietnam's 10-year EPI regression puts it in a notable position of environmental risk, with worsening threats to biodiversity already affected by habitat loss. Policies have been implemented to accelerate the deployment of more sustainable energy sources like solar and wind, but its distribution grid has struggled to adapt to these less consistent sources of energy.

Social

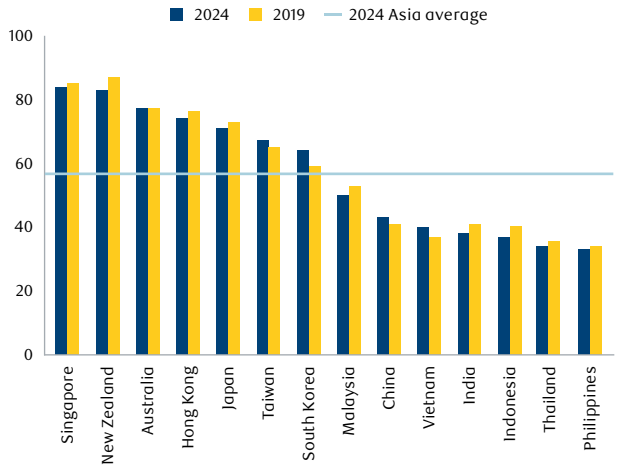
Figure 10: Asia's FWI by country (out of 100)



Source: Freedom House, as at 2025.

Governance

Figure 11: Asia's CPI by country (out of 100)



Source: Transparency International, as at 2025.

Social observations

In Asia and globally, we have seen a deterioration in the political rights and civil liberties of citizens. The average FWI in Asia was 60.4 in 2024, a decline from the 2019 average of 62.6 (Figure 10). Overall, Asia had a higher FWI score than the global average of 55.2 in 2024, which decreased over the 2018 global average of 56.7. Hong Kong's FWI score has decreased by 15 points since 2019. India also experienced a marked decline in its FWI score, falling by 8 points since 2019.

Governance observations

The average CPI across our covered regions of Asia was 56.8 in 2024, a small decline from the 2019 average of 57.4 (Figure 11). Overall, Asia had a higher CPI score than the global average of 43.0, which was slightly down compared to the 2019 global average of 43.2.

We have seen improvements from last year (2023) in Indonesia, Australia, and Singapore. Countries that have regressed include Japan, New Zealand, and Hong Kong. The survey details the impact of corruption on the achievement of climate targets in a variety of ways, through the influence of policy and regulation and the allocation of climate financing.

In 2024, India was the subject of a US indictment looking at a clean energy business that paid >USD250 million in bribes to Indian government officials to secure multi-billion dollar solar energy contracts. This is particularly pertinent as India receives more climate finance than any other country, highlighting the vulnerability caused by the existing corruption.

In Vietnam, 32 wind and solar projects were investigated for abuse of power, with limited whistleblower protection offered by the central government[8]. South Korea, which has been marked as a significant improver over the last few years, has been bearing the fruit of its focus on quelling corruption. Last year, a group of young climate activists won a legal battle that ultimately concluded with the South Korean government having to amend a law described as 'inadequate' by the Constitutional Court.

Summary

Given the size of the population, India, China, and Indonesia have large roles to play with regards to climate risk. In the areas of social and governance, Asia performs higher than the rest of the world. The country analysis highlights that countries with high ESG risk within Asia include Vietnam (environmental), China (social), and the Philippines (governance). When we meet management teams of companies that are based in or operate in these countries, we need to be particularly aware of the specific risks. Countries that have shown improvement include China (environment), Malaysia (social), and Indonesia (governance).

[8] bloomberg.com/news/articles/2024-08-12/vietnam-police-begin-probe-of-32-wind-power-projects-media.

Thought pieces

Semiconductors – the water challenge

Key takeaways

- Water is an essential input to the semiconductor ("semi") manufacturing process, which takes place on a significant scale across Asia.
- Semis are a vital component in the development of Artificial Intelligence ("AI"), and demand is expected to continue to increase.
- The high concentration of semi fabrication facilities in areas of water scarcity poses considerable internal and external risks.
- Semiconductor manufacturers must explore approaches to water use that protect local stakeholder communities and ensure a reliable supply chain.

The environmental costs of technology

The rapid expansion of AI across the globe has intensified focus on its environmental impact, particularly the substantial resource demands for water and energy. While the discourse surrounding the environmental impact of AI is mainly around its data centres, semis are a critical component of AI infrastructure and supply chains. As semis are essential for AI operations, their water footprint can be considered an indirect environmental cost associated with AI's production and deployment.

Both AI data centres and semi manufacturing facilities require significant amounts of water. While data centres use water primarily for cooling purposes, semi production is much more water-intensive, requiring significant volumes at nearly every stage of the process. Taiwan's largest chip manufacturers consume 12% of the country's total industrial water supply[9], illustrating the industry's deep reliance on water resources. As the global competition for AI leadership accelerates and demand for semis rises, sustainable solutions will need to be found for industrial water management.

This growing demand for semis is now driving major policy initiatives, with governments recognising the strategic importance of both AI and the infrastructure required to support it. In January 2025, Trump announced the Stargate Project, a USD500 billion private-public partnership aimed at expanding AI infrastructure within the U.S.[10]. On the other side of the world, China has long been a leader in supporting its domestic semi industry, reinforced by its "Made in China" 2025 plan, which includes a goal of 70% self-sufficiency in semi production by 2025[11].

In fact, the semi industry has become a key focal point in the U.S.-China rivalry, with both countries leveraging industrial policies such as export restrictions and domestic subsidies to advance their competitive positions.

The water challenge for semi manufacturing

As more countries look to onshore semi manufacturing and expand production capacity, the semi production process – including its critical reliance on water – will come under more intense scrutiny. Water availability is increasingly becoming a key factor in semi manufacturing, for as capacity increases, so does the demand for water resources, making it a growing concern for long-term sustainability of the industry.

> **"While data centres use water primarily for cooling purposes, semi production is much more water-intensive, requiring significant volumes at nearly every stage of the process."**

Compounding the issue is the fact that there are many regions globally that are currently facing water scarcity, designated as 'water stress' areas. This term refers to areas where the demand for water exceeds the available supply, or where water resources are severely limited. Today, many existing semi production sites – particularly in China – are in high water stress areas. China currently operates 44 semi fabrication plants, with an additional 23 under construction and 10 more planned[12]. However, based on data from the World Resources Institute, more than half of these will be in areas of water stress, with 43% in areas of "extremely high" water stress. In these regions, the future of the industry is heavily reliant upon the development of scalable water resources.

[9] JPMorgan, September 2024.
[10] scientificamerican.com/article/heres-whats-in-stargate-the-usd500-billion-trump-endorsed-plan-to-power-u-s/.
[11, 12] JPMorgan, September 2024.

However, such projects require significant financial investment. Expenditure for new semi production facilities can be up to USD20 billion depending on the size of the facility[13]. Of this total, approximately up to 10% is typically allocated to water-related projects, including the installation of ultrapure water ("UPW") and wastewater treatment systems. When presented with spend figures such as these, it becomes evident that water is one of the most important elements in the semi production process.

The strict cleanliness requirements for producing semis are well known even outside of the industry. Images of sterile 'cleanrooms' – highly controlled environments designed to minimise contaminants – illustrate the intricate nature of the production process. To ensure optimal performance, wafers (the foundation for producing integrated circuits and microchips) must be free of contaminants that could negatively impact their circuits. Because of this, nearly every stage of the fabrication process involves several cycles of washing and rinsing with UPW.

Water is used in several different ways throughout the production process, with approximately 75% used in the manufacturing process itself[14]. The remaining amount is consumed by cooling towers and scrubbers, which are used to remove contaminants. Notably, the development of UPW requires copious amounts of water. As a result, both the chip manufacturing process and the water purification process contribute to the industry's significant overall water demand.

Potential solutions to water scarcity

Given that demand for both semis and water is expected to grow, innovative solutions are emerging to expand the water supply.

Water recycling is a method of water re-use that can be applied at various stages of the fabrication process, although the intricacy of semi fabrication can make implementation difficult.

Use of reclaimed water is also a method of potentially extending the useful life of water. Wastewater can be treated and recycled from both households and larger water-intensive facilities, appealing to cost-sensitive investors due to reductions in both wastewater output and required input through the use of a recycled commodity.

Finally, desalination technologies can offer viable pathways to mitigate scarcity and support the industry's long-term sustainability. The number of desalination plants has been growing globally, but production and cost efficiencies must be improved for the technology to become properly scalable.

Importance of Asia and Asian companies

Corporations and governments across Asia play a critical role in creating sustainable growth in semis and data centres. Three of the top five largest semi manufacturing countries in the world – Japan, China, and Taiwan – are based in Asia. Because of their established position in the semi industry, Asian institutions are increasing their involvement in the global search for water resources.

As an example, in 2021, Singapore launched the Sustainable Tropical Data Centre Testbed ("STDCT"), the first tropical data centre testbed. This is a joint venture between Nanyang Technological University Singapore, National University of Singapore, and 22 industry partners, government agencies, and research institutions, all working together to drive innovation and sustainability. The technology partners contribute cutting-edge solutions for testing and validation, while industry leaders offer insights into market needs and operational challenges.

According to STDCT, its projects aim to help data centres reduce energy consumption and carbon dioxide emissions by up to 40%, decrease water usage by 30-40%, and achieve a power usage effectiveness of less than 1.2 for a combination of air and liquid cooling. By developing innovative cooling technologies for use in tropical climates, the STDCT has the potential to set industry standards while enhancing Singapore's competitiveness within the industry.

Our approach

For bottom-up active managers such as ourselves, the demand for more water use in the semi production process creates compelling long-term opportunities to add exposure not only to semi producers and manufacturers, but also to companies involved in treating water for industrial use. From the creation of UPW, to recycled and desalinated water, there are various ways to capture the upside as the industry scales up to meet future demand.

[13] construction-physics.com/p/how-to-build-a-20-billion-semiconductor.
[14] JPMorgan, November 2024.

Japan's nuclear renaissance

Key takeaways

- Following the 2011 Fukushima disaster, public opinions of nuclear energy in Japan were profoundly negative.
- Following a period of decline in nuclear energy production across Asia, systemic changes are prompting Japan to revisit this once favoured method of domestic energy production.
- Japan's historic experience of nuclear energy and forward-looking understanding of the associated technologies could position the country to be a global leader in this growing industry.

The 2011 Fukushima disaster marked a significant turning point for Japan's nuclear energy policy. In the aftermath of reactor meltdowns and mass evacuations, the government took immediate steps to shut down Japan's nuclear reactors and implement stringent safety reviews. In the years that followed, regulatory scrutiny and widespread public opposition kept most reactors offline, reshaping Japan's energy mix and reducing the contribution of nuclear power generation from 15% in 2010 to 4% in 2019[15] (Figure 12).

> **"The 2011 Fukushima disaster marked a significant turning point for Japan's nuclear energy policy."**

During this time, Japan faced a persistent energy shortfall and a sharp increase in reliance on imported fossil fuels, particularly liquefied natural gas ("LNG"). However, recent geopolitical and economic developments have prompted a reassessment of nuclear's role in Japan's energy security. Japan now aims to increase nuclear's contribution to the power mix from 6% in 2019 to at least 20% by 2030[16] (Figure 13).

Why Japan is re-embracing nuclear? Three critical drivers:

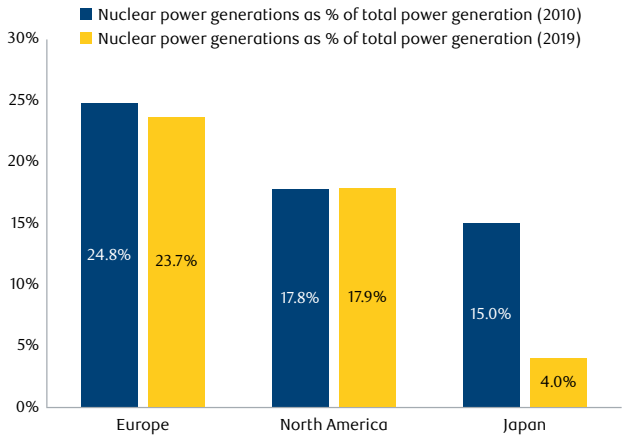
1. Global energy price volatility

As a resource-poor country, Japan has long been vulnerable to external shocks in global energy markets. This was starkly illustrated by Russia's invasion of Ukraine in 2022, which led to sharp increases in energy import costs, especially for LNG, which saw record price spikes. With fossil fuel prices still above pre-2022 levels, nuclear power offers a stable, domestically-generated alternative that reduces reliance on volatile imports.

2. Yen depreciation and economic pressures

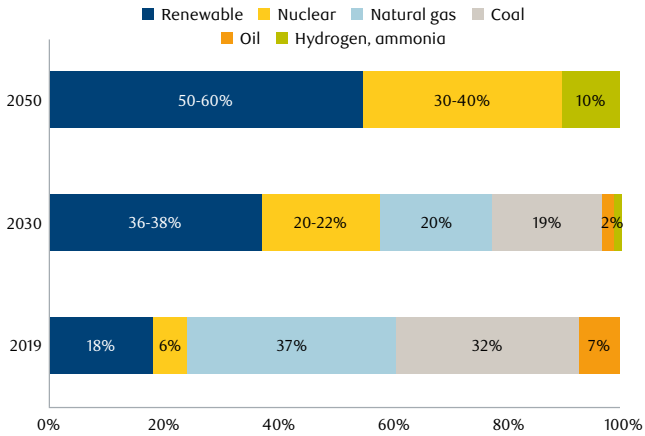
The depreciation of the yen has further compounded Japan's energy challenges. A weaker currency makes imported energy more expensive, widening Japan's trade deficit and placing additional strain on domestic businesses and households. Despite these pressures, Japan's economy has continued to recover, with resilient consumer spending and export competitiveness helping to offset some of the impact.

Figure 12: Nuclear power generation mix by region (2010 versus 2019)



Source: IEA, as at April 2025.

Figure 13: Japan's basic energy plan power mix targets



Source: Jefferies, as at November 2024.

[15] IEA, April 2025.
[16] Jefferies, November 2024.

Nevertheless, with electricity prices rising due to higher fuel import costs, support for nuclear power has grown, in part due to its potential to stabilise domestic energy prices and reduce exposure to currency-driven volatility.

3. A focus on sustainability
Japan's commitment to achieving net-zero carbon emissions by 2050 has placed nuclear power firmly back in focus. While renewable energy sources such as wind and solar remain priorities, their intermittency challenges make nuclear power an essential component of Japan's clean energy strategy.

Japan's nuclear advantage

Global leadership in nuclear engineering

Japan has been an acknowledged leader in nuclear technology for several decades, with engineering expertise and advanced manufacturing capabilities. The country has been instrumental in reactor development, component manufacturing, and fuel innovation, ensuring it remains a key player in the global nuclear industry. As Japan ramps up its nuclear ambitions, several domestic companies are well-positioned to drive both reactor restarts and next generation advancements.

> "Japan is at the forefront of investment in next-generation nuclear solutions."

Hitachi has been present in Japan's nuclear sector since the 1960s and, through a joint venture with General Electric, has developed the BWRX-300 small modular reactor ("SMR"). The compact reactor is both adaptable and cost effective, and it has drawn global interest for its broad spectrum of applications. Mitsubishi Heavy Industries ("MHI") is another veteran of Japan's nuclear industry that has positioned itself at the head of the oncoming nuclear resurgence. Having been the lead contractor for nearly all pressurised water reactor projects in Japan, the firm is now working to bring existing plants into compliance with post-Fukushima regulations. MHI is also involved in a plethora of projects looking to develop technologies used in nuclear power generation, including light water and compact nuclear reactors. Japan Steel Works is a further long-term stakeholder in Japan's nuclear energy production. The firm now holds approximately 80% market share globally for nuclear pressure vessels[17], and it is a leader in the supply of critical nuclear infrastructure, employing advanced fabrication techniques inside the largest production facilities in the world.

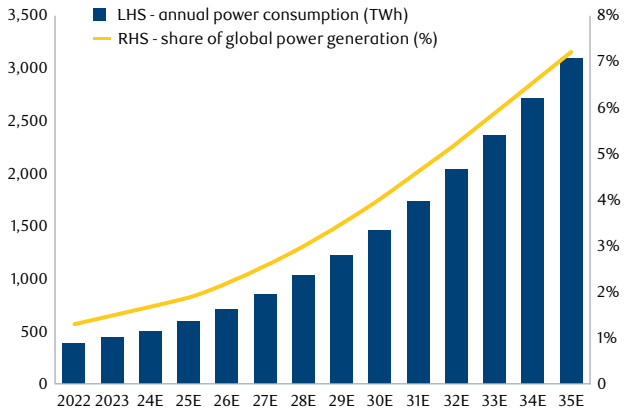
These three companies have embedded themselves into both the nuclear industry in Japan and the conversation globally, through historical reputation and experience combined with forward-looking development. All the signs appear to suggest a refocusing of interest towards nuclear energy, and as new attitudes form around its use, new technologies will be implemented to ensure its safe and efficient production, allowing these firms to ride a wave of fresh interest.

Small modular reactors and the AI energy challenge

These companies, and others like them, demonstrate Japan's leadership in nuclear engineering, supporting not only the restarting of domestic reactors but also the next wave of global nuclear expansion. Indeed, Japan is at the forefront of investment in next-generation nuclear solutions, such as SMRs and fusion, to meet future energy demands.

One of the most significant shifts in global energy demand comes from AI-driven data centres, which require vast amounts of electricity to operate (Figure 14). Japan's investment in SMRs is particularly relevant in this context. These compact, flexible reactors provide local, decentralised, scalable nuclear power, making them ideal for powering energy-intensive industries. As AI expands, demand for stable, carbon-free electricity sources will likely accelerate nuclear's role in the global energy mix. Technology giants such as Google, Microsoft, and Amazon, are exploring SMRs as a potential solution to power their infrastructure growth plans.

Figure 14: Total power consumption for AI and traditional data centres versus % of total global power demand



Source: IDC, Macquarie Research, as at April 2024. E = estimates.

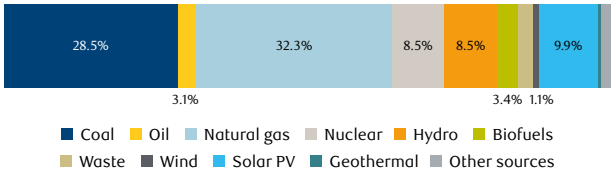
[17] World Nuclear Association, March 2021.

Nuclear fission versus fusion

Meanwhile, Japan is also heavily involved in fusion energy research. In nuclear fusion, two atoms slam together, replicating the process that powers the sun to theoretically produce virtually unlimited clean, renewable energy. Fusion reactions don't produce the radioactive by-products associated with fission, making them safer. The JT-60SA reactor in Ibaraki, northeast of Tokyo, was developed in collaboration with the EU and is currently the world's largest superconducting tokamak[18].

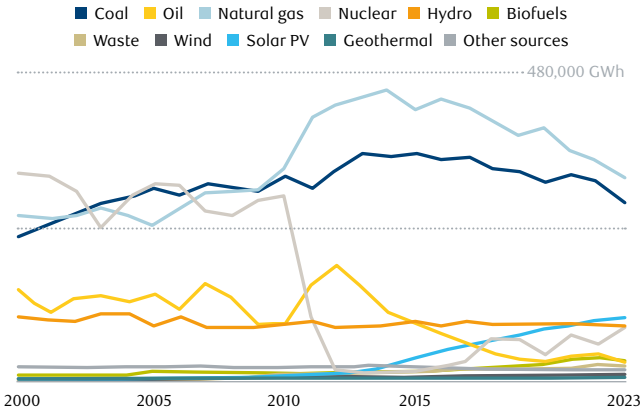
Japan is also supporting the Fusion by Advanced Superconducting Tokamak ("FAST") initiative, which seeks to develop a fusion power plant by the 2030s. Fujikura Ltd is a Japanese equipment manufacturer that has delivered large volumes of rare earth-based, high temperature superconducting tapes to an organisation developing the world's first commercial fusion generator in the U.S.. These tapes are necessary for the effective production of a fusion machine, and they position Fujikura as one of the frontrunners of fusion technology.

Figure 15: Electricity generation in Japan (2023)



Source: iea.org/countries/japan/energy-mix.

Figure 16: Evolution of electricity generation in Japan since 2000



Source: iea.org/countries/japan/energy-mix.

Japan's nuclear renaissance is here to stay

After a decade of hesitation, Japan is now firmly re-integrating nuclear power into its energy strategy. The combined forces of energy security, economic stability, and sustainability considerations make nuclear a strategic necessity rather than an option. For example, Japan's power usage by data centres in 2022 was about 7.5TWh, but by 2050 this is expected to increase by anywhere between 21-198TWh[19]. Figures 15 and 16 show that since at least 2000, nuclear is the only method of power generation that Japan has sought to scale. It therefore likely provides the most effective solution to Japan's shortfall in power generation, particularly given that Japan's current nuclear energy output is 70% lower than it was in 2010[20].

For investors, this shift highlights a longer-term trend rather than a short-term policy pivot. Japan's nuclear resurgence is not just about meeting past energy needs – it is about powering the industries of the future. Companies involved in Japan's nuclear industry – whether in construction, maintenance, or fuel supply – stand to benefit from an extended growth cycle.

Japan has already set a target of 20-22% of its energy mix from nuclear by 2030[21]. However, given the country's rising energy demands and the economic constraints that inertia may bring, there is scope for this target to be revised upwards. That said, Japan's carbon neutrality targets have been delayed as the intense CapEx required for these ventures becomes more apparent. Japan already runs a considerable trade deficit in the energy sector, and this could influence some of its decisions around proliferation of nuclear energy.

Beyond Japan, whether through SMRs or large-scale plants, the world will rely on the country's nuclear expertise to meet both growing global energy demand and the pressing need to decarbonise. The position that Japanese firms have carved out in the nuclear industry makes it a key player in the rising energy demand boom, and we are keeping a keen eye on developments in the country to see how this might translate into a global context.

[18] A tokamak is a device that uses powerful magnetic fields to confine plasma in a doughnut-shaped chamber, known as a torus, for the purpose of achieving controlled nuclear fusion.
[19] csis.org/analysis/can-nuclear-be-japans-answer-meeting-its-energy-demand-expansion.
[20] iea.org/countries/japan/energy-mix.
[21] Jefferies, November 2024.

China's ageing population and a circular economy: recycling and remanufacturing for growth

Key takeaways

- China's demographic structure has long been emerging as a source of pain for the country's economy and productivity. Subsequent falling productivity and an inequitable pension allocation structure are creating a perfect storm of downward pressure on GDP growth.
- Given China's industrial overcapacity and insufficient consumption, recycling and remanufacturing could provide the ongoing support needed in the absence of new growth.
- End-of-life vehicles ("ELVs") provide a great example of a source of remanufacturing opportunity for the Chinese economy.

Ageing population pressures consumption

China's domestic consumption as a percentage of GDP has been lagging the rest of the world, accounting for only 50-60% of national output over the past few decades versus a global average of 70-80%[22]. An over-reliance on investment and exports, alongside income inequality, have been key factors behind China's subdued consumer demand. Falling property prices, sluggish wage growth, and increased geopolitical tensions have also been contributors to this in recent years.

China's rapidly ageing population represents a formidable structural challenge over the coming decades. The country's population began to decline in 2022, mainly due to its low birth rate. Added to this, since 2023, China has experienced a startling increase in the number of people retiring. By 2040, China will have over 400 million retirees, representing about 36% of its population[23].

The rural elderly make up 54.7% of all retirees in the country (Figure 17). People in this subset see their income plunge once they are excluded from non-farm job markets; their pension benefits represent only 6.5% of the corporate pensioner segment and just 3.4% of government pensioners (Figure 18).

> **"China's rapidly ageing population represents a formidable structural challenge over the coming decades."**

An abrupt loss of income for so many of those entering retirement is highly detrimental for consumer demand. People who anticipate much lower income after retirement tend to put a greater proportion of their wages towards saving rather than consumption, further dragging on consumer demand, and limiting their contributions to China's growth outlook.

Figure 17: The composition of the retiree population

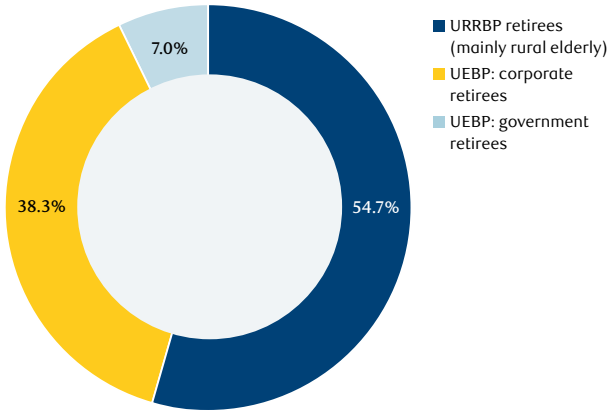
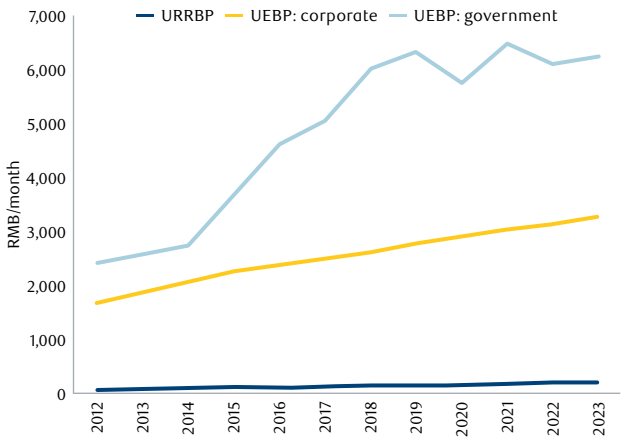


Figure 18: Pension benefits per capita under the basic scheme



Source: China Labour Statistical Yearbook, Nomura Global Economics.Note: the composition is computed based on 2022 data.

[22] NBS, World Bank, Wind & Nomura Global Economics, as at August 2024.
[23] who.int/china/health-topics/ageing.

Focus shifting from 'new growth' to recycling

Historically, Beijing has relied on tax cuts and subsidies to overcome negative demand shocks. However, it is increasingly turning to alternative ways to boost consumer demand as it seeks to navigate the nation's longer-term structural challenges. Initiatives to encourage consumers to replace old products for new ones have become a major policy focus.

In 2024, the government unveiled a programme to boost the trade-in of consumer products, including cars and home appliances. The plan, which should stimulate domestic consumer demand for cars and certain other consumer goods, also aims to further spur the development of the country's circular economy by encouraging recycling and remanufacturing.

This strategy should create robust conditions for growth in Chinese vehicle recycling and remanufacturing, driven by an increasing number of ELVs as cars bought in the economic boom years are retired, and a rising recycling rate for ELVs.

The value chain of automobile recycling

Remanufacturing uses advanced technology to transform recycled auto parts into products that are of equal or better quality than new products. It involves dismantling, cleaning, inspecting, reprocessing/ replacement, reassembly, and quality control testing.

The cost of remanufactured auto parts is lower than brand new parts as fewer resources and people are needed to make them. This could go some way to helping alleviate the productivity problem caused by China's ageing population, improving the output efficiency of the available workforce. Remanufactured auto parts are also better for the environment, reducing carbon footprint via the manufacturing process, raw material extraction, and logistics.

Capturing the ELV remanufacturing opportunities in China

China has by far the largest number of registered automobiles in the world, with approximately 336 million registered vehicles in 2023[24]. In comparison, the U.S. contained 283 million registered cars in 2022[25]. This results in a huge addressable market for ELV recycling in China. Nevertheless, China's ELV remanufacturing industry is still in an early stage of development compared to many developed countries, with North America and Europe currently leading the global remanufacturing aftermarket.

Comparing China's ELV market to Europe underlines the immense growth potential for Chinese auto recycling and remanufacturing. The more mature EU market has around double the ratio of ELVs collected as a percentage of total vehicles versus China[26]. While China is currently focused on boosting the uptake of recycling and remanufacturing domestically, it could increasingly emerge as a serious challenger in the global remanufacturing logistics industry.

Policy formalisation is driving growth in ELV recycling

In 2019, the Chinese authorities introduced measures to incentivise collection, enabling car owners to sell ELVs at a better price through official dismantling centres. The government also strengthened environmental protection and clamped down on illegal processing. These changes have stimulated the formalisation of China's auto recycling industry, with the number of registered recycling firms rising by around 70% in the three years after the measures were introduced.

> "China could increasingly emerge as a serious challenger in the global re-manufacturing logistics industry."

ELV recycling has traditionally suffered from high leakage. The China Resource Recycling Association (CRRA) estimates that 35-38% of the country's ELVs are dispatched to certified auto dismantling facilities. However, research by JPMorgan estimates the true figure is closer to 56%. This would mark a substantial improvement compared with estimated collection rates prior to 2000.

A refocus towards recycling and remanufacturing

A refocus towards recycling and remanufacturing growth makes sense for the auto sector against the backdrop of a rapidly ageing population: growth in Chinese ELVs is set to eclipse new vehicle registrations over the coming years, especially as cars purchased during China's economic boom years are being retired. China's refocus towards recycling and remanufacturing is creating substantial growth opportunities for Chinese firms operating in the industry, and there is significant potential for consolidation, given the number of small firms with less efficient operations.

[24] english.www.gov.cn/archive/statistics/202412/13/content_WS675c1240c6d0868f4e8edeca.html.
[25] statista.com/statistics/183505/number-of-vehicles-in-the-united-states-since-1990/.
[26] Based on annual data released by Ministry of Public Security of PRC, Ministry of Commerce of PR, Eurostat, and the Europe Commission.

A pivot towards auto recycling and remanufacturing is also good news for the environment due to carbon footprint reduction in manufacturing, raw materials, and transportation. Whilst there are significant savings due to the lower energy consumption and labour requirements of remanufacturing versus manufacturing, the biggest saving comes from a much-reduced need for raw materials, particularly as recycling and remanufacturing auto parts allows for the recovery and reuse of metals from ELVs.

Contemporary Amperex Technology Co. Ltd (CATL)

CATL is a Chinese manufacturer of batteries, including those used in electric vehicles (EVs). The firm has manufacturing bases in China, Germany, and Hungary, as well as resource centres in China and Indonesia. Within these resource centres are recycling bases, where materials are reclaimed from waste batteries to be re-constituted for production. The implementation of these centres has allowed CATL (via a subsidiary) to achieve a recovery rate of 99.6% for nickel, cobalt and manganese[27].

This significant rate of recovery and the leveraging of relationships at different stages of the value chain allows CATL to effectively reduce total carbon emissions throughout the production cycle of its batteries. Sustainable use of materials is key to the effective adoption of EVs and the success of the industry, and the introduction of a recycling value chain helps to alleviate the issues caused by battery production (Figure 19).

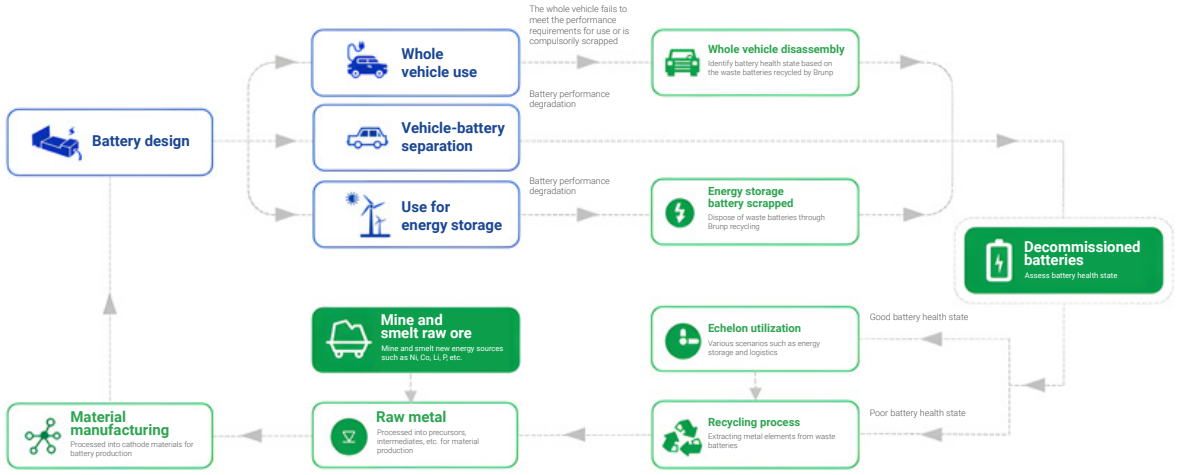
That said, the market for the recycling of EV batteries remains very small and thus generates a limited financial impact. In the longer term, the increased use of this service is expected to follow the growth trend of the EV market after a lag period. It is therefore reasonable to suggest that the use of recycled batteries and their constituent materials might see a notable increase over the next few years. With market-leading firms like CATL claiming their stake in this growing trend, we hope to see a broader recognition for the benefits of battery recycling and auto remanufacture, in terms of both the environment and the societies and economies that it supports.

Capturing the opportunity

Beijing has shown through the ongoing formalisation of the remanufacturing industry that it sees worthwhile benefits in supporting its growth, and their view is becoming even more impactful with the number of ELVs set to outstrip the number of new vehicles registered. The gap in process efficacy when compared with Europe shows that the opportunity is there to be taken.

Our team is made up of industry and country experts who specialise in bottom-up stock picking with ESG considerations integrated throughout. We see investment opportunities from a long-term, global point of view, and we aim to identify strong businesses that can navigate demographic challenges or disruptive industry changes better than others. We believe that for leading firms such as CATL, ESG is not only about managing risk, but shaping and seizing new growth opportunities. Our own first-hand, bottom-up work assesses these opportunities holistically, studying dynamics across the value chain, and gauging how management team works with various stakeholders to win over the long term.

Figure 19: CATL's battery recycling value chain



Source: CATL.

[27] catl.com/en/news/6201.html.

Asian Equity team profiles

Mayur Nallamala

Head of RBC Asian Equity, Senior Portfolio Manager

26 years of experience

BSc (Economics and Economic History) (1998), London School of Economics, U.K.

Mayur is a managing director, and the CEO and head of the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. Prior to joining the firm in 2013, he was a portfolio manager at JF Asset Management responsible for Asia Pacific ex-Japan mandates, managing assets on behalf of sovereign wealth, institutional, and retail clients around the world. Mayur had earlier worked at major brokerage firms in London and Hong Kong, working in derivatives and equity research. He began his career in the investment industry in 1998. Mayur holds a BSc in Economics and Economic History from the London School of Economics.

Siguo Chen

Portfolio Manager

12 years of experience

MSc (Finance) (2012), HEC Paris, France; BSc (Mathematics and Applied Mathematics) (2010), Beijing University of Aeronautics and Astronautics, China.

Siguo is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. She is the lead manager for the team's China strategy and is also the team's healthcare specialist. Prior to joining the firm in 2017, Siguo was a sell-side equity analyst with UBS, where she specialized in China and Hong Kong consumer sectors and Hong Kong Equity strategy. She started her career in the investment industry in 2012. Siguo holds an MSc in Finance from HEC Paris and a Bachelor's degree in Mathematics & Applied Mathematics from Beijing University of Aeronautics and Astronautics.

Maya Funaki

Portfolio Manager

14 years of experience

BA (Financial Economics) (2011), Columbia University, U.S.

Maya is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. She is the lead manager for the team's Japan strategy and is also the team's industrials specialist. Prior to joining the organization in 2015, Maya had worked as an analyst at Morgan Stanley in the investment banking division. She started her career in the investment industry in 2011. Maya graduated Summa Cum Laude with a BA in Financial Economics from Columbia University.

Derek Au

Portfolio Manager

12 years of experience

CPA, CA (2011), MAcc (2009), BSc (Accounting and Financial Management) (2008), University of Waterloo, Canada.

Derek is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. He is the team's communications and technology specialist. Derek joined the firm in 2013 as part of a graduate program that allowed him to work in a variety of roles in Toronto and Hong Kong across fixed income, Canadian equities, and Asian equities. He had earlier worked at a global accounting firm Ernst & Young, where he was responsible for the financial advisory and audit of publicly listed corporations in Toronto. He started his career in the investment industry in 2013. Derek holds an MAcc and a Bachelor's degree in Accounting and Financial Management from the University of Waterloo, Canada, and is a Chartered Accountant.

Asian Equity team profiles

Chris Lai, CFA

Portfolio Manager

13 years of experience

CFA (2014); MBA (Finance Strategy) (2012), London Business School, U.K.; BBA (Finance) (2007), The McDonough School of Business, Georgetown University, U.S.

Chris is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. He is the team's financials and real estate specialist. Prior to joining the organization in 2015, Chris was a sell-side equity analyst at Bank of America, where he specialized in the financials sector across Asia. He had earlier worked at HSBC in a number of sales and risk management roles in different parts of the world. Chris started his career in the investment industry in 2012. Chris holds an MBA from the London Business School and a Bachelor's degree in Business Administration from Georgetown University. Chris is also a CFA® Charterholder.

David Soh

Head of Research, Portfolio Manager

20 years of experience

Certificate in ESG Investing, CFA Institute (2022); MSc (Investment Management) (2013), Hong Kong University of Science and Technology, Hong Kong; BSc (Political Science) (2005), Korea University, South Korea.

David is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. Prior to joining the organization in 2014, David worked at Credit Suisse, specializing in quantitative investment strategies for Asian equities, having earlier worked as a management consultant at McKinsey & Company. He started his career in the investment industry in 2007. David holds an MSc in Investment Management from the Hong Kong University of Science and Technology and a Bachelor's degree in Political Science from Korea University.

Selina Lu, CFA

Portfolio Manager

15 years of experience

CFA (2015); MBA (2018), Rotman School of Management, Canada; BBA (Accounting) (2010), University of Toronto, Canada.

Selina is a portfolio manager on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. She is the team's commodities, utilities, and consumer specialist. Selina joined the organization in 2018 as a part of a graduate program that allowed her to work in a variety of roles in Toronto and Hong Kong across North American equities and Asian equities. Prior to this, she had worked at Scotiabank, gaining experience in corporate banking, credit risk, and finance. Selina began her career in the investment industry in 2010. Selina holds an MBA from the University of Toronto's Rotman School of Management and a BBA in Accounting from the University of Toronto. She is also a CFA® charterholder and a Financial Risk Manager® accreditation, and holds the Chartered Market Technician® (CMT) designation.

Asian Equity team profiles

Qian Yu

Analyst

8 years of experience

MEng (Technology Management for Innovation) (2017), University of Tokyo, Japan; BEng (Electronic and Electrical Engineering) (2014) (Fudan-Birmingham undergraduate 3+1 collaboration), University of Birmingham, U.K.; BSc (Microelectronics) (2014), Fudan University, China.

Qian is an analyst on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. In this role, he is responsible for assisting in China equity investment research. Prior to joining the organization in 2021, Qian was a sell-side equity analyst at UBS Securities in Shanghai, where he specialized in the China industrials sector. He started his career in the investment industry in 2017. Qian holds a MEng in Technology Management for Innovation from University of Tokyo, a BEng in Electronic and Electrical Engineering from University of Birmingham, and a BSc in Microelectronics from Fudan University.

Robert Johnson

Analyst

5 years of experience

MBA (2023), London Business School, with an exchange at Hong Kong University of Science and Technology; BSc (Computer Science) (2016), Durham University, UK.

Robert is an analyst on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. He works closely with portfolio managers to support bottom-up research, primarily on Japan. Prior to joining the team in 2025, Robert was on the RBC Wealth Management Generalist Program, rotating through multiple positions across RBC Global Asset Management. Before this, he had spent time as a long/short analyst at London-based hedge fund Sloane Robinson, as well as multiple years as a specialist at Bloomberg. He started his career in the investment industry in 2019.

Cornelius Gilbert

Analyst

1 year of experience

MBSc in Quantitative Finance and Risk Management Science from The Chinese University of Hong Kong (2024).

Cornelius is an analyst on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. He works closely with portfolio managers to support bottom-up research across all sectors in the Asia Pacific region. Cornelius joined the organization in 2024, which is also when he started his career in the investment industry. Cornelius holds a BSc in Quantitative Finance and Risk Management Science from The Chinese University of Hong Kong.

Asian Equity team profiles

Owen Ou, CFA

Portfolio Engineer

11 years of experience

CFA (2018); MStat (2020), University of Hong Kong; BEng (Civil Engineering) (2014), BBA (2014), Hong Kong University of Science and Technology, Hong Kong.

Owen is a portfolio engineer on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited, focused on portfolio construction and risk analysis. Prior to joining the organization in 2018, Owen was an analytics consultant at a financial data and software company FactSet, specializing in quantitative modelling and portfolio analytics. He started his career in the investment industry in 2014. Owen holds an MStat from the University of Hong Kong, a BEng in Civil Engineering and a BBA from the Hong Kong University of Science and Technology. He is also a CFA® charterholder

Camilla Bryden

Product Specialist

8 years of experience

MA (English Literature) (2015), University of St Andrews, United Kingdom.

Camilla is a product specialist on the RBC Asian Equity team at RBC Global Asset Management (Asia) Limited. She assumed this role in 2024 after working closely with the team since 2022. Camilla joined the firm in 2021 as a client services manager, where she was responsible for managing and developing relationships with institutional clients. Prior to joining the firm, she worked across sales and marketing at Ocean Dial Asset Management, specializing in Indian equities. She started her career in the investment industry in 2018. Camilla holds an MA in English Literature from University of St Andrews.

Kathy So

Asian Equity Trader

8 years of experience

MA (Philosophy) (2017), The Chinese University of Hong Kong; BSc (Economics and Finance) (2011), The University of Hong Kong.

Kathy is a senior Asian equity trader on the Equity Trading team at RBC Global Asset Management (Asia) Limited. She joined the organization as an equity trader in 2016, which is when she started her career in the investment industry, specializing in Asian markets. Kathy began her career in financial journalism with experience anchoring Now Business News Channel, covering Asia, Europe, and U.S. markets. Kathy holds a Master of Arts in Philosophy from the Chinese University of Hong Kong and a Bachelor of Science in Economics and Finance from the University of Hong Kong.

Clement Cheng

Head of Asian Equity Trading

20 years of experience

MBA (2010), Australian Graduate School of Management, Hong Kong; BComm (Accounting) (2002), Macquarie University, Australia.

Clement is a senior trader and head of Asian equities trading on the Equity Trading team at RBC Global Asset Management (Asia) Limited. In this role, he manages the Hong Kong trading desk and executes trades for the organization's Asia Pacific, Japan, and China strategies. Prior to joining the firm in 2014, Clement had gained experience at major buy-side and sell-side institutions, including Harvest Global Investments Limited and BEA Union Investment, as an equity trader. He started his career in the investment industry in 2005. Clement holds an MBA from the Australian Graduate School of Management in Hong Kong and a Bachelor of Commerce in Accounting from Macquarie University.

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