ESG Trendsetters in APAC

We identify the APAC trendsetters, and the companies at risk of lagging behind, for three key MSCI 2022 ESG Trends to Watch – climate, biodiversity and supply-chain risks – using our underlying ESG datasets and metrics.

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April 2022

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Finding the ESG Trendsetters in APAC

MSCI has published its forward-looking Global ESG Trends to Watch report every year since 2012. Earlier this year, in recognition of the 10-year anniversary of this report, we explored 10 trends of potential importance for this year and beyond, as listed below.

CLIMATE AS FIRST AMONG EQUALS	THE MAINSTREAMING OF ESG	EMERGING RISKS AND OPPORTUNITIES
1. **The New 'Amazon Effect'**: Corporates Pushing Corporates for Net-Zero Supply Chains	5. **Greenwashing** Recedes as Common ESG Language Emerges	8. **Coffee vs. Burgers**: Biodiversity and the Future of Food
2. **Private-Company Emissions** Under Public Scrutiny	6. **Regulation at a Crossroads**: Convergence or Fragmentation?	9. **Bacteria Rising**: Another Health Crisis Looms
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See: 2022 ESG Trends to Watch, **December 2021**

How the 2022 ESG Trends Impact APAC

For the MSCI APAC ESG Research team, three of these trends resonated with particular strength and importance, as they present major risks and opportunities in the APAC region – **The Coal Conundrum: Rethinking Divestment, Coffee vs. Burgers: Biodiversity and the Future of Food** and **The New 'Amazon Effect': Corporates Pushing Corporates for Net-Zero Supply Chains**. In this report we explore these three trends more deeply, delving into the underlying ESG metrics and ultimately identifying a group of companies that we felt confident in describing as ESG trendsetters, as well as their counterparts that appeared to be lagging.

- **The Coal Conundrum: Rethinking Divestment (see page 10):** If the goal is a net-zero portfolio, divesting might seem the path of least resistance, especially when it comes to coal. But in APAC, this is not a viable option for a diversified portfolio, given the prevalence of **coal-fired power** in both up- and downstream emissions calculations. Using a combination of transition and low-carbon stocks is a difficult balancing act but may provide an answer for effective decarbonization at the portfolio level.

- **Coffee vs. Burgers: Biodiversity and the Future of Food (see page 17):** With a fifth of the world's agricultural area but one-half the global population, the pressures on land, forest cover and the marine system in the APAC region are immense. There is, as of yet, a dearth of opportunities for investors to address these, however. A couple of **consumer staples** firms made it into the top-scoring companies on our key biodiversity risk metrics, but more radical solutions may be required to find where the opportunities lie to address this long-term issue.
- **The New 'Amazon Effect': Corporates Pushing Corporates for Net-Zero Supply Chains (see page 23):** The supply chain in APAC is already one of the thorniest issues for ESG investors, owing to difficulties in tracking labor management and sourcing raw materials. Scope 3 emissions for purchased goods, which are highest for the **food products** and **real estate** sectors, now add climate risk into the mix. This makes transparency in the supply chain an overriding aim, particularly for the **technology hardware** sector, which faces significant risks on all three of these supply-chain metrics.

ESG Metrics for Three 2022 ESG Trends in APAC

To assess how these three 2022 ESG trends affected markets, sectors and companies, we used a selection of metrics from our ESG and Climate methodologies (see page 31 for detailed definitions). These include:

- **The Coal Conundrum:**
  - Implied Temperature Rise (ITR)
  - Low Carbon Transition Score (LCT),
  - Climate VaR,
- **Biodiversity and the Future of Food:**
  - Biodiversity & Land Use Key Issue Score,
  - Packaging & Waste Key Issue Score,
  - Sustainable Impact Metrics, and
  - Alignment with UN Sustainable Development Goals (SDGs) 12, 14 and 15.
- **Net-Zero Supply Chains :**
  - Supply-Chain Labor Standards Key Issue Score,
  - Controversial Sourcing Key Issue Score,
  - Scope 3 Category 1 and 2: Purchased Goods

We used these metrics to determine which markets and sectors in the APAC region had the greatest and lowest risk exposures related to these three ESG trends, as well as where the opportunities may lie. To start, we took the market and industry group averages of the underlying ESG and climate metrics (i.e., average scores or average

Implied Temperature Rise) and looked at the performance across each of the three trends.

2022 APAC Risks and Opportunities by Market and Sector

BY MARKET, it is notable that very few markets had high scores on all three key ESG trends. The smaller developed markets of **New Zealand** and **Taiwan** fared the best, with relatively strong average scores for climate change and biodiversity & land use. The tech-dominated Taiwanese market also scored well on supply-chain issues, in contrast to some of its APAC peers (see Exhibit 5 below) and was only let down by its consumer companies' performance on packaging materials & waste.

By contrast, **Australia** scored badly, owing to its dependence on coal and materials, which gave that market an average ITR of 3°C, above the APAC average, and increased the risks for biodiversity key issues. The one positive area is on the supply chain, where modern slavery regulation has forced Australian companies to address and disclose their practices in greater detail than other markets.

The main markets of concern in APAC are, not surprisingly, those that are heavily coal-dependent and where tackling biodiversity can be controversial owing to the competing claims on land use for forestry or farming, chiefly **India** and **Indonesia**.

Meanwhile, the major markets of **Japan** and **Mainland China** scored relatively well on climate, with their investment in cleaner technologies helping to offset the dependence on fossil fuel, but concerns remain over biodiversity and supply chain.

Exhibit 1: Average 2022 ESG Trend-Related Metrics by Market

	CLIMATE		BIODIVERSITY		SUPPLY CHAIN		
Market	ITR (°C)	Low Carbon Transition	Biodiversity & Land Use	Packaging Materials & Waste	Supply Chain Labor Standards	Controversial Sourcing	Scope 3 (1&2) as % of Total
APAC Region	**2.8**	**6.0**	**3.8**	**2.9**	**4.8**	**4.3**	**18%**
Australia	3.0	5.9	2.9	3.1	6.6	3.4	11%
Hong Kong	2.8	5.9	5.0	5.9	6.6	2.8	31%
India	3.5	5.6	4.1	5.9	5.2	2.0	6%
Indonesia	4.0	4.8	2.9	6.1	3.2		10%
Japan	2.5	6.1	6.0	1.5	4.6	3.9	23%
Mainland China	2.7	6.0	2.6	4.0	3.7	4.3	16%
Malaysia	3.2	5.5	4.5	4.8	5.3	5.0	19%
New Zealand	2.3	6.5	6.3	4.9			56%
Philippines	3.1	5.6	5.1	4.7			27%
Singapore	2.5	5.9	4.2	5.4	5.1		51%
South Korea	2.6	6.0	4.3	1.5	4.4	4.4	21%
Taiwan	2.7	6.0	5.9	2.0	7.1	5.5	42%
Thailand	3.0	5.7	6.7	5.0	5.5		13%

Source: MSCI ESG Research, LLC. All metrics are average scores, apart from ITR (°C) and Scope 3 (%). MSCI APAC IMI Index universe, n=3,561, data as of January 2022. If there was insufficient data to provide a market average (i.e., n≤2), the average score was not included in the table.

BY SECTOR, the industry groups that had the highest risk exposure to all three 2022 ESG trends were **food & beverage**, **technology hardware** and **consumer durables & apparel**, with the former facing some of the greatest challenges in APAC owing to land use and climate change, as well as Scope 3 purchased goods carbon emissions potentially adding another supply-chain risk to already-significant challenges.

At the other end of the spectrum, the **health-care** and **financial services** industry groups have limited exposure to any of the three 2022 ESG trends, but the addition of Scope 3 into their climate calculations may become a key area of concern in the future as scrutiny over financed and purchased emissions increases.

Exhibit 2: Average 2022 ESG Trend-Related Metrics by Industry Group

	CLIMATE		BIODIVERSITY		SUPPLY CHAIN		
Industry Group	ITR (°C)	Low Carbon Transition	Biodiversity & Land Use	Packaging Materials & Waste	Supply Chain Labor Standards	Controversial Sourcing	Scope 3 (1&2) as % of Total
Food & Beverage	3.1	5.7	2.0	3.3	4.5		81%
Tech. Hardware	2.3	6.2		2.6	5.3	4.1	54%
Consumer Dur.	2.7	6.1		2.0	4.5	3.6	48%
Materials	4.0	5.2	1.8	4.1			16%
Semiconductors	2.8	6.2			1.4	5.3	54%
Consumer Servs.	2.1	6.1		1.2	3.5		47%
Retailing	2.1	6.4			4.7	3.3	43%
Capital Goods	3.2	6.3	3.9		8.2		20%
Household Products	2.1	6.1		2.8			60%
Pharma & Biotech	1.8	6.3		3.4			44%
Energy	7.0	2.2	3.8				4%
Food Retailing	1.7	6.3			4.5		60%
Software & Services	1.6	6.6				6.6	74%
Transportation	2.2	6.0	6.5				25%
Autos	5.5	5.9					16%
Utilities	4.7	4.3	6.0				4%
Banks	2.8	6.6					14%
Healthcare Equip.	2.0	6.3					56%
Comm. Services	2.0	6.3					42%
Real Estate	1.9	6.3					77%
Div. Financials	1.7	6.5					38%
Telecoms	1.7	6.3					57%
Insurance	1.4	6.6					83%

Source: MSCI ESG Research. All metrics are average scores, apart from ITR (°C) and Scope 3 (%). MSCI APAC IMI Index universe, n=3,561, data as of January 2022. If there was insufficient data to provide an industry average (i.e., n≤2), the average score was not included in the table.

Identifying the APAC ESG Trendsetters

Having identified which industry groups face the highest risks, and potential opportunities, for each of the three main 2022 ESG Trends in the APAC region, the next challenge was to find which companies in the MSCI APAC IMI Index universe were tackling these issues well, and which ones may be falling behind.

Focusing on the highest-risk industries for each of the three 2022 ESG Trends, we ranked individual companies' performance on the key ESG and climate metrics versus their industry peer group in APAC to assess how well they are positioned to tackle these issues. We consider that those that fall into the top quartile versus their peers are managing the risks and opportunities arising from these issues well, while those in the bottom quartile are lagging.

What was notable, however, was that **we did not find any companies that were in the top quartile across all three of the 2022 ESG Trends**, with the top-scoring companies on climate often not showing such positive results on biodiversity or supply-chain issues and vice versa.

In addition, the wide range of scores on each of the key issues within APAC demonstrates that it is not the market or the industry that necessarily governs a company's ESG performance on this metric, but rather action taken by the companies themselves. This means that delving into the individual company performance against the peer group is required to find the genuine APAC trendsetters and weed out the laggards.

The Coal Conundrum: The first group in the table below looks at the highest-risk industries for **climate change** – **food & beverages**, **materials**, **energy** and **utilities**. We've taken the highest-scoring companies in the top quartile and the worst-scoring in the bottom quartile, ranked against their industry group for the APAC region (LCT and ITR scores). To narrow this selection further, we selected those in the top or bottom quartiles globally for LCT Management scores, as this reflects either how well they are managing their climate risks or whether, like the utilities companies Meridian and Renova, they are exposed to climate opportunities such as renewable energy.

Exhibit 3: The Climate Trendsetters: Top- and Bottom-Quartile Companies

Industry Group	Company	Market	LCT Management Score	LCT Score	ITR (°C)
TRENDSETTERS					
Energy	Worley, Ltd	AU	7.5	3.2	2.0
	ENEOS Holdings	JP	7.4	3.2	3.2
Food, Beverage & Tobacco	CJ CheilJedang	KR	5	6	1.3
	Thai Union Group	TH	4	5.9	2.4
Materials	Daiken	JP	8.3	6.2	2.1
	Takasago Int.	JP	7.7	5.9	2.3
Utilities	Meridian Energy	NZ	9.3	9.1	1.9
	Renova	JP	8.9	10	2.1
LAGGING					
Energy	Yankuang Energy	CN	1	0	10.0
	Coal India	IN	1	0	10.0
Food, Beverage & Tobacco	S Foods	JP	0	5.2	4.4
	Maeil Dairies	KR	0.4	5.4	4.6
Materials	China Hongqiao	CN	1	2.6	10.0
	LB Group	CN	1.2	3.9	7.3
Utilities	Adani Power	IN	1.4	0.2	6.7
	SDIC Power	CN	2.5	1	6.7

Source: MSCI ESG Research. Data as of January 2022. LCT: Low Carbon Transition Score, ITR: Implied Temperature Rise. AU: Australia, JP: Japan, KR: South Korea, TH: Thailand, NZ: New Zealand, CN: Mainland China, IN: India.

Biodiversity and the Future of Food: The second group, shown in the table below, is examined for the highest-risk industries for **biodiversity** – **food & beverages** and **materials**. These are the companies falling into the top and bottom quartiles in their industry group for the APAC region for MSCI's five main biodiversity-related metrics, including Biodiversity & Land Use and Packaging Materials & Waste Key Issue scores.

Exhibit 4: The Biodiversity Trendsetters: Top- and Bottom-Quartile Companies

Industry Group	Company	Market	Bio. & Land Score	Pack. & Materials Score	Raw Mat. Score	Water Stress Score	Toxic Emissions Score
TRENDSETTERS							
Materials	IGO Limited	AU	4.9			5	4.6
	POSCO	KR	3.4			6.4	5.5
	Hokuetsu	JP			7.2	4.4	5.0
	Mitsubishi Materials	JP	5.2			4.5	4.4
	Allkem	AU	6.8			5.6	4.3
Food, Bev. & Tob.	Nestle (Malaysia)	MY		5.8	5.5	7.2	

Table continued on next page.

Industry Group	Company	Market	Bio. & Land Score	Packaging & Materials Score	Raw Mat. Score	Water Stress Score	Toxic Emissions Score
LAGGING							
Materials	Yintai Gold Co.	CN	0.0			1.9	1.1
	Silver Lake Resources	AU	0.0			0.0	0.9
	Jiangxi Copper	CN	0.0			1.5	0.0
	Bellevue Gold	AU	0.0			0.7	0.0
Food, Bev. & Tobacco	Fujicco Co	JP		0.0	2.7	0.0	
	Maeil Dairies Co	KR		0.0	2.6	0.0	

Source: MSCI ESG Research. Data as at January 2022. AU: Australia, JP: Japan, KR: South Korea, TH: Thailand, NZ: New Zealand, CN: Mainland China, IN: India, ID: Indonesia; MY: Malaysia. Bio. & Land Score: Biodiversity & Land Use Key Issue Score.

Net-Zero Supply Chains: The final group in the table below looks at the highest-risk industries for **supply-chain risks** – **food & beverages** and **materials**. These are the highest-scoring companies in the top and bottom quartiles in their industry group for the APAC region for MSCI's main supply-chain metrics, supply-chain labor standards and raw-material sourcing.

Exhibit 5: The Supply Chain Trendsetters: Top- and Bottom-Quartile Companies

Industry Group	Company	Market	SCLS* Score	Controversial Sourcing Score	Scope 3 (1&2) as % of Total
TRENDSETTERS					
Tech. Hardware	Inventec	TW	9.60	5.8	60%
	ACER	JP	7.70	9.0	60%
	HTC	TW	7.30	6.0	44%
	FUJIFILM Holdings	JP	6.70	7.0	28%
	EIZO	JP	6.60	7.7	54%
	Asustek Computer	TW	6.10	10.0	59%
LAGGING					
Tech. Hardware	GRG Banking	CN	3.4	2.3	53%
	Dawning Info.	CN	2.9	2.3	58%
Semiconductors	Tongwei	CN	1.4	0.8	75%
Household Appliances	Midea Group	CN	2.6	2.3	n/a
	Fujitsu General	JP	2.6	2.1	31%
	Beijing Roborock	CN	3.0	2.3	55%
Consumer Electr.	Shenzhen MTC	CN	2.9	2.3	53%

*Source: MSCI ESG Research. Data as of January 2022. TW: Taiwan, JP: Japan, CN: Mainland China. *SCLS: Supply Chain Labor Standards.*

APAC's Coal Conundrum

Climate change is both an existential threat and major investment risk for the APAC region, with the challenge of shifting the energy supply from the current 47% reliance on coal to non-fossil fuel power generation arguably the most difficult, as outlined in our 2022 Global Trends to Watch report. For this region, divestment from high carbon emitters may simply be avoiding the problem, as well as leading to very skewed sector bias, which may make it a higher priority to pick the most progressive emissions-cutters or to engage with the climate laggards.

Key Industries:

Highest climate risks: energy, gas & electric utilities, construction materials, metals & mining, food products, automobiles

Highest climate opportunities: **electrical equipment**, **road & rail, technology hardware**, **financials, industrials**

Key Climate Change Metrics:

- **Implied Temperature Rise (ITR)**: Designed to show the temperature alignment of companies with global temperature goals, based on a company's carbon emissions and reduction targets.
- **Low Carbon Transition Score (LCT)**: Assessment of the risks and opportunities for a company related to the low carbon transition, including product and operational alignment, as well as low carbon solutions.
- **Climate VaR**: Designed to provide a forward-looking and return-based valuation assessment to measure climate-related risks and opportunities.

Reliance on Coal-Fired Power Generation

APAC's reliance on coal-fired power generation is a well-known concern and, although there has been significant progress made by the utilities companies in the region in reducing their coal dependency over the last five years (from 54% of total power generation in 2016/17 to 47% in 2020/21, see Exhibit 4), it is still significantly higher than the Rest of the World average of just 14%. Countries with utilities in the MSCI APAC IMI Index that are particularly dependent on coal-fired power are India (87% in 2021), Australia (81%), Malaysia (64%) and Indonesia (61%).

This reliance on coal-fired power generation affects not just the utilities sector, however, but feeds through into the climate exposures of the upstream and downstream sectors through higher Scope 2 and 3 emissions, leading to elevated climate risk for these markets compared with the global average and their APAC peer group.

Exhibit 6: MSCI APAC Index Utilities Sector Generation by Fuel Type (% of Total)

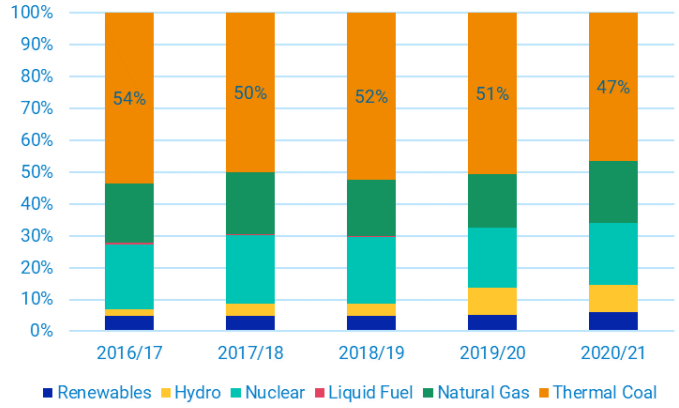
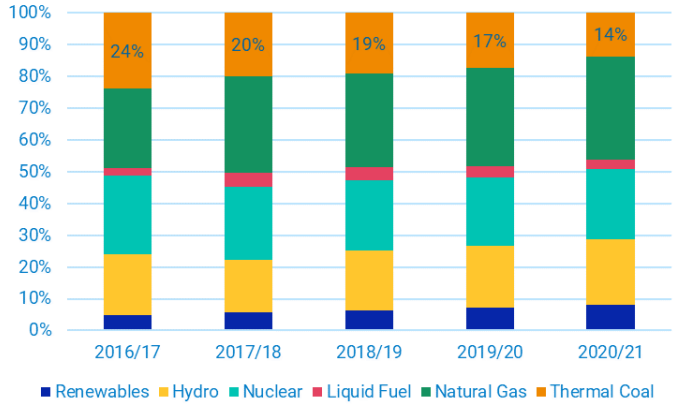


Exhibit 7: MSCI ACWI Index Utilities Rest of World Sector Generation by Fuel Type (% of Total)



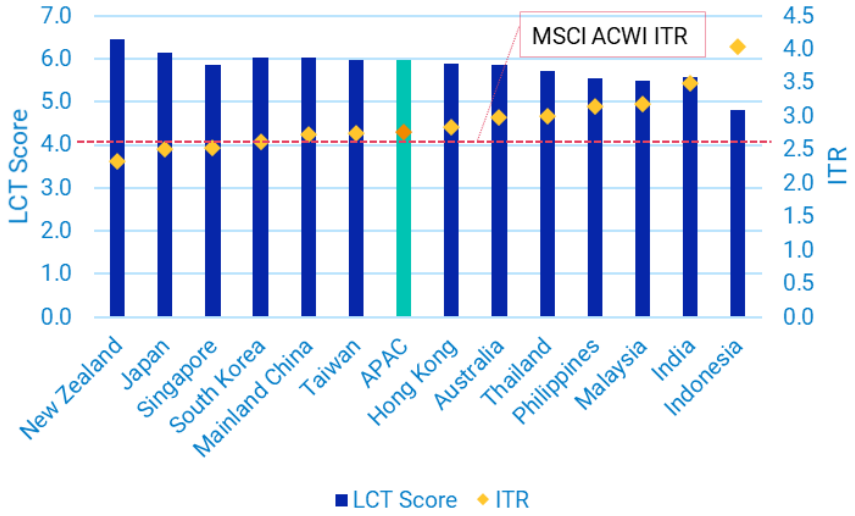
Source: MSCI ESG Research. Data as of January 2022.

Using MSCI's Implied Temperature Rise metric, which calculates how much the global temperature would increase if the entire economy were to over- or undershoot its allocated carbon budget by the same amount as an individual company, we can get an indication of the level of climate risk across different APAC markets. In line with the higher levels of coal-fired power generation for these countries, companies in Indonesia, India and Malaysia all have an average ITR of over 3°C, compared with an APAC average of 2.8°C, while only New Zealand, Japan and Singapore have an Implied Temperature Rise lower than the MSCI ACWI Index average.

While the MSCI APAC IMI Index universe overall has a similar average Implied Temperature Rise to the MSCI ACWI IMI Index (around 2.8°C), there is a marked difference on a sector level, with many in the services sector, including **telecommunications**, **financials** and **real estate** companies, having a lower Implied Temperature Rise than their MSCI ACWI Index peers. For real estate, this is partly due to the relatively high number of real estate investment trusts (REITs) in the region versus quoted property developers, but for financials, this is partly due to the high number of financial institutions that have committed to green financing principles and targets.

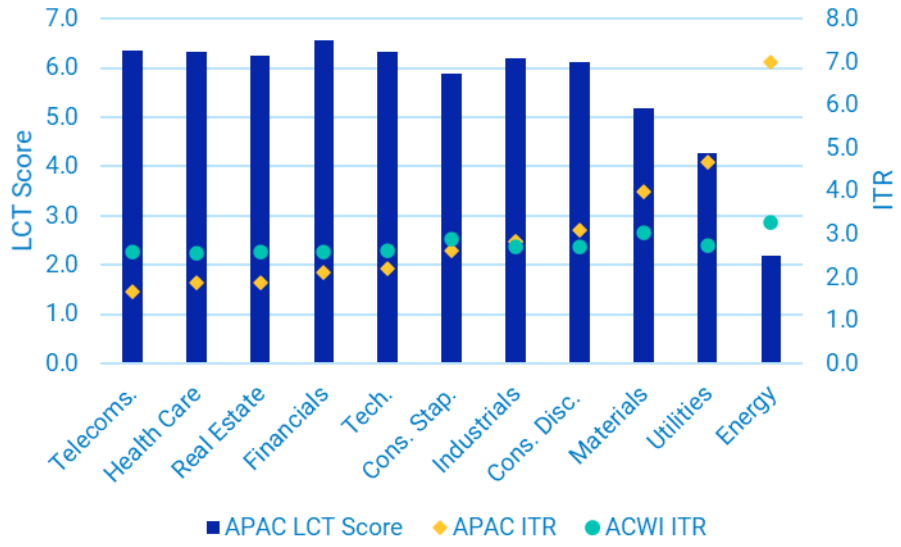
The sectors of greatest concern are those most directly affected by the coal-dominated energy mix, with the MSCI APAC Index **energy** sector's ITR of over 7°C more than double that of the MSCI ACWI Index, the **utilities** sector almost 2°C higher at 4.7°C, and the **materials** sector at almost 4°C versus 3°C for the constituents of the MSCI ACWI Index.

Exhibit 8: Key APAC Markets Average LCT and ITR, 2022



Source: MSCI ESG Research. Data as of January 2022. ITR: Implied Temperature Rise.

Exhibit 9: MSCI APAC and ACWI Index Sectors Average LCT and ITR, 2022



Source: MSCI ESG Research. Data as of January 2022. ITR: Implied Temperature Rise.

Targeting Net-Zero

This sector bias on climate in the APAC region creates a major challenge for investors attempting to target either lower carbon emissions or net-zero for APAC portfolios that mirror the MSCI APAC Index investment universe. To align the

portfolio with net-zero, which implies net-zero emissions by 2050 and global temperature increase limited to 1.5°C, the seemingly simplest solution would be to select companies with the lowest Implied Temperature Rise. This automatically would lead to a lower-carbon portfolio, but it also would bring a number of unintended consequences.

To illustrate the problem, selecting companies in the 3,560-strong MSCI APAC IMI Index that fall into the top quartile of ITR scores led to an investment universe of 882 companies and reduced the total ITR to 1.8°C from 3.1°C. But it also ended up with very uneven proportions by market and sector.

First, the portfolio ended up heavily tilted toward Japan, owing both to its overall energy composition and Japanese companies' above-average climate-related performance. Second, it ended up very skewed toward software, consumer services and retail, as well as insurance. Many of the essentials of life, including food & beverages and autos, as well as key sectors such as industrials and technology hardware were heavily underrepresented.

Exhibit 10: Change in Sector Proportion, Top-Quartile ITR Selection Vs. MSCI APAC Index

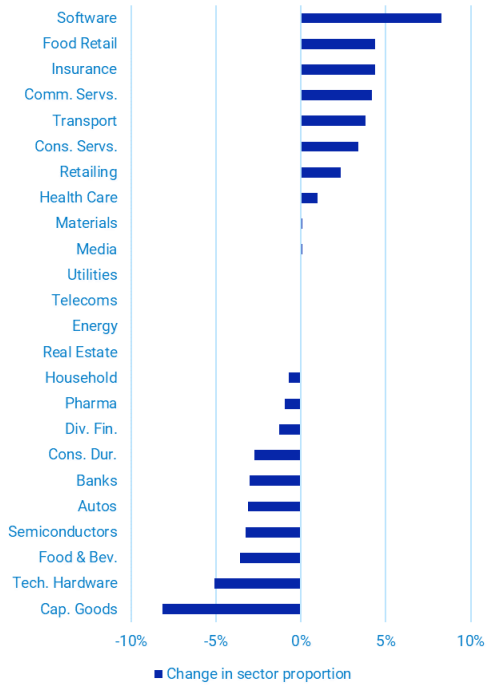
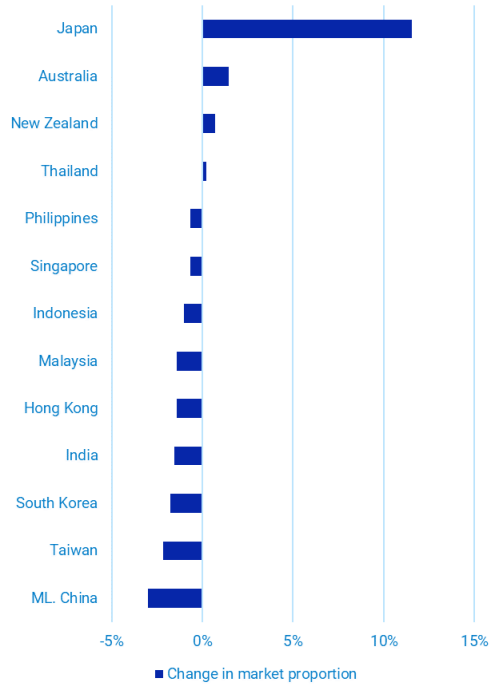


Exhibit 11: Change in Market Proportion, Top-Quartile ITR Selection Vs. MSCI APAC Index



Source: MSCI ESG Research. Data as of January 2022.

While this may be acceptable for investors who simply want the lowest level of carbon emissions in their portfolios, the lack of sector diversification creates concentration risks. To address this issue, one option would be for investors to instead select companies with the **lowest Implied Temperature Rise by industry group** instead of compared with the APAC universe as a whole. Selecting top-quartile industry group-based ITR companies resulted in a portfolio that has an ITR of 1.9°C, while retaining the same sector exposure as the parent index (see Exhibit 12).

Targeting Transition

An alternative approach, however, is not just to consider which companies have the lowest Implied Temperature Rise, given that this may be due simply to the nature of their business (for example, a consumer services company), but also to consider which are actively addressing climate risk or have plans to reduce their carbon emissions and climate impact.

For this, we can instead look at individual companies' performance on climate change issues using our **Low Carbon Transition (LCT) score**, which assesses companies on a range of climate metrics, including performance on energy emissions, achievement against targets and level of responsibility for climate-related issues at an executive level.

Using the same process of selecting companies in the top quartile of the MSCI APAC Index universe based on LCT score yielded a slightly more diversified universe in terms of market selection, but was heavily skewed to the financials sector, with a proportion of almost 30ppt offset by lower exposure to real estate and materials. This gave a portfolio ITR of 2.0°C as well as lowering to -16.1% the overall Climate Value-at-Risk[1] (VaR), which provides a stressed market valuation of a portfolio in relation to aggregated transition and physical cost and profit projections until the end of the century.

Again, selecting the top quartile by industry group addressed the sector-skew issue, as well as allowing investors to identify climate leaders and laggards by industry group for engagement. This, however, led to a lower reduction in ITR versus the MSCI APAC Index, with an ITR of 2.5°C and a relatively high Climate VaR of 19.1%.

Combining Lower Carbon and Carbon Transition

For the APAC markets, where there is both a significant sector skew in terms of carbon emissions as well as significant opportunities for company engagement and improvement for climate laggards, combining these two approaches may provide a

[1] Using the Aggregated Company 2° Climate VaR (2°C AIM CGE & aggressive physical risk scenarios) metric.

solution that addresses both these issues, allowing investors to both reduce total carbon emissions in their portfolio and identify which companies are proving to be the best at tackling climate change issues overall.

Selecting the top quartile of companies by LCT scores to find the "climate champions," then refining this selection further by just choosing companies that fall into the top quartile by ITR to reduce the portfolio's total carbon emissions yielded a universe of 366 stocks with an ITR of just 1.5°C and a Climate VaR of just 14.1%. The sector skew became excessive, however, with a financial-sector proportion of almost 50% and telecommunications and services accounting for most of the rest.

Using the industry group-based quartiles instead of the overall market quartiles preserved similar sector proportions as the parent index (see Exhibit 12), with a slightly larger universe of 419 stocks. This produced a slightly higher ITR of 1.9°C and a relatively lower Climate VaR of -17.3% and with less sector bias. There was, however, still a strong market bias toward Japan.

Exhibit 12: Change in Sector Proportion, Top-Quartile LCT and ITR by Industry Vs. MSCI APAC Index

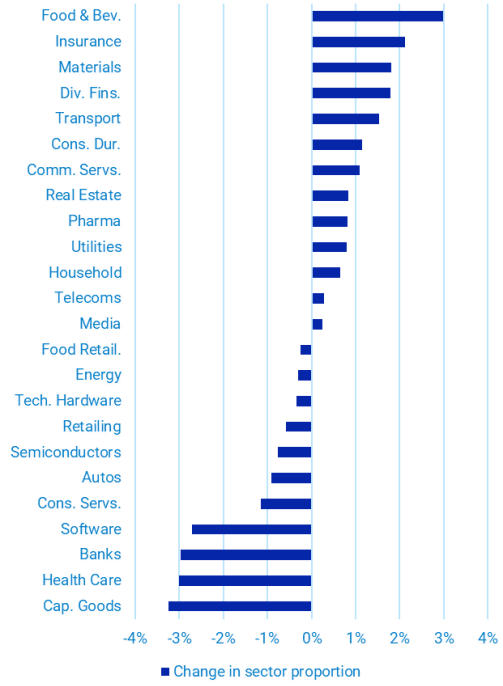
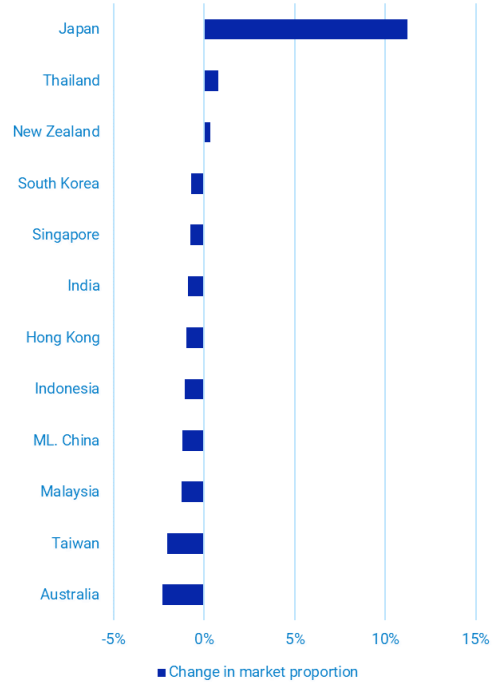


Exhibit 13: Change in Market Proportion, Top-Quartile LCT and ITR by Industry Vs. MSCI APAC Index



Source: MSCI ESG Research. Data as of January 2022.

The Highest Climate Risks

And what of the climate laggards? The reverse approach to that outlined above can be used to identify companies that don't just have high carbon risk, they also are not taking active measures to address energy efficiency or reduce their carbon emissions over the long term. Taking the bottom quartile for LCT and ITR by industry group yielded 415 companies representing the highest level of both carbon risk and long-term transition risk in the APAC market and serving to illustrate the extent of the potential risk to APAC portfolios from climate change.

This group of climate laggards would have an ITR of 5.4°C as well as a Climate VaR of 62.3%, of which the majority is transition, not physical, risk. By market this group had a higher proportion of companies in India, Hong Kong, Taiwan, Malaysia and Indonesia, while, by design, the sector proportions were not significantly different to the parent index.

Exhibit 14: ITR and Climate VaR for MSCI APAC IMI Index Top- and Bottom-Quartile Stock Selection Based on LCT and ITR Metrics

CLIMATE METRIC QUARTILE SELECTION	ITR (°C)	CLIMATE VAR (%)	TRANSITION CLIMATE VAR (%)
MSCI APAC IMI INDEX	**2.8**	**-26.7%**	**8.42%**
TOP QUARTILE			
LCT Q1	2.0	-16.1%	+1.10%
ITR Q1	1.8	-24.9%	-6.06%
LCT Q1 & ITR Q1	**1.5**	**-14.4%**	**-1.16%**
LCT INDUSTRY GROUP Q1	2.5	-19.4%	0.70%
ITR INDUSTRY GROUP Q1	1.9	-21.9%	-4.49%
LCT & ITR INDUSTRY GROUP Q1	**1.9**	**-17.3%**	**0.01%**
BOTTOM QUARTILE			
LCT Q4	4.1	-56.1%	-32.6%
ITR Q4	5.2	-44.6%	-24.0%
LCT & ITR Q4	5.4	-62.3%	-39.6%

Source: MSCI ESG Research. Data as of January 2022.

Refining these top- and bottom-quartile selections down to an individual company assessment to identify the climate leaders and laggards in the APAC region can be achieved in two main ways. First, by looking at a company's overall climate management practices, as reflected in the low carbon transition management score (list of companies shown on page 29), to focus on transition, or by selecting the companies with the lowest ITR scores or Climate VaR to identify the lowest (or highest) carbon footprint or climate risk, depending on investor preference.

APAC's Biodiversity and the Future of Food

The delayed COP15 meeting and the publication of the Taskforce on Nature-related Financial Disclosures recommendations this year is focusing minds on biodiversity at a global level, but many of the risks associated with this issue are concentrated in APAC. With a fifth of the world's agricultural area but one-half the global population, the pressures on land, forest cover and the marine system are immense, but there appears at present to be a dearth of either solutions or opportunities for investors to address these.

Key Industries:

Highest biodiversity risks: energy, metals & mining, food products, paper products, chemicals

Highest biodiversity opportunities: machinery, utilities

RISKS: We have two main and four additional ESG metrics (excluding climate) related to biodiversity risk, as outlined in the **Data and Metrics Overview: Assessing Biodiversity Impacts and Risk report (February 2022)**.

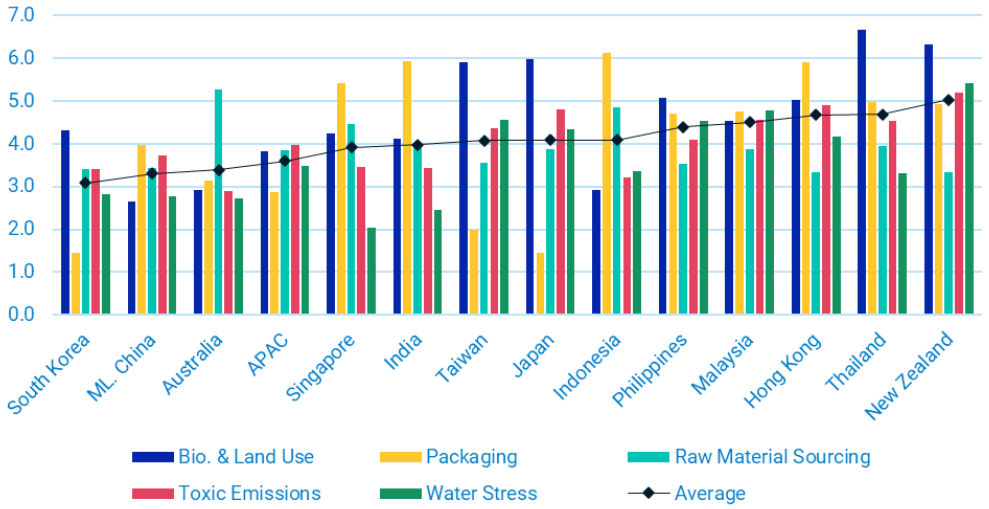
- **Main ESG metrics**: **Biodiversity & Land Use**, **Packaging Materials & Waste**
- **Additional ESG metrics**: **Raw Material Sourcing**, **Toxic Waste**, **Water Stress**, **E-Waste**

OPPORTUNITIES: We can identify companies with exposure to biodiversity solutions and opportunities through either sustainable impact metrics or alignment with the UN Sustainable Development Goals (SDGs), of which **SDG 12 – Responsible Consumption & Production**, **SDG 14 – Life Below Water** and **SDG 15 – Life on Land** are the most relevant.

For the APAC market as a whole, **biodiversity & land use** and other related topics such as **packaging & waste** and **raw materials** tend to be the environmental Key Issues where Asian companies score lower than the global average. The main markets where these are significant concerns are South Korea, Mainland China and Australia, with all these markets below the APAC average on the five key metrics, apart from Biodiversity & Land Use in South Korea, Packaging Materials & Waste in Mainland China and Raw Material Sourcing in Australia.

By contrast, New Zealand and Thailand come out relatively strongly, particularly on the key Biodiversity & Land Use Key Issue.

Exhibit 15: Biodiversity-Related Key Issue Scores, MSCI APAC IMI Index Constituents by Market



Source: MSCI ESG Research. Data as of January 2022.

By sector, the lowest scores for the MSCI APAC IMI Index were in the **consumer staples** and **materials** sectors, which both also were below the MSCI ACWI Index average on the two key biodiversity issues: biodiversity & land use and packaging & waste. The **industrials** and **utilities** sectors score relatively strongly, although the latter is still lagging the global average.

Exhibit 16: Biodiversity-Related Key Issue Scores, Constituents of MSCI APAC IMI Index by Sector

Sector	Bio. & Land Use	Pack. Mat. & Waste	Toxic Emissions	Water Stress	Raw Material	E-Waste
Cons. Disc.		1.4	5.3	3.6	3.4	4.4
Cons. Stap.	2.0	3.2		2.3	3.9	
Energy	3.8		4.3	3.2		
Health Care			4.0			
Industrials	6.4		4.9		5.1	
Tech.			3.8	5.0		3.1
Materials	1.8	4.1	3.0	3.7	5.8	
Utilities	6.0		4.9	4.0		
Total	**3.8**	**2.9**	**4.0**	**3.5**	**3.8**	**3.7**

Source: MSCI ESG Research. Data as of January 2022. Key issues: Biodiversity & Land Use, Packaging Materials & Waste, Raw Material Sourcing, Toxic W aste, Water Stress, and E-Waste.

Biodiversity Leaders by Sector

In contrast to carbon emissions, which is increasingly being considered a key issue for all sectors, biodiversity key issues don't apply to all sectors equally. This means that to identify the companies that are either managing their biodiversity risks well or badly, it is more effective to look at the best and the worst companies *by industry* rather than against the whole universe.

Just selecting companies that score in the top quartile for their key biodiversity issues yielded 322 companies in the MSCI APAC IMI Index universe, with the market selection favoring Japanese, Australian and Malaysian companies and a lower proportion of South Korea, Mainland China and India stocks.

The reverse also applies for picking the companies in the bottom quartile, although **South Korea** is notable for having a larger proportion of low-scoring companies, with this chiefly due to low scores for companies on Packaging & Waste and Raw Materials Key Issues.

Exhibit 17: Change in Industry Group Proportion, Top- and Bottom- Quartile Biodiversity Scores vs. MSCI APAC IMI Index

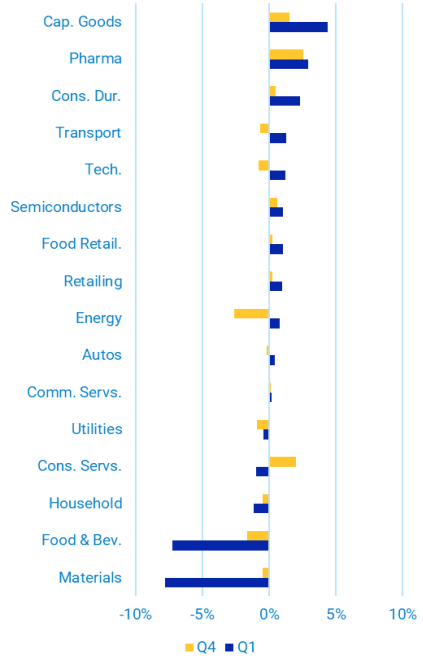
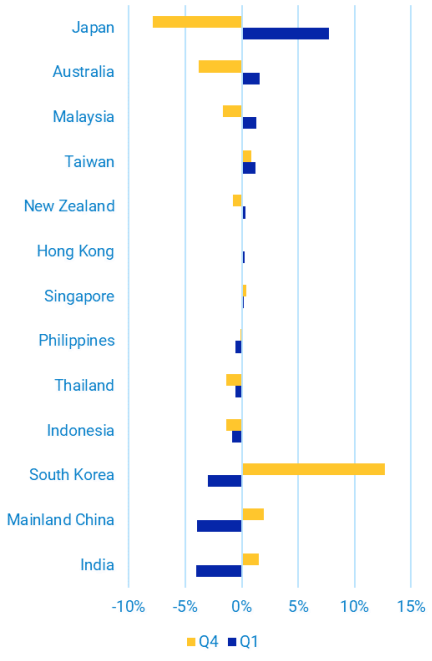


Exhibit 18: Change in Market Group Proportion, Top- and Bottom- Quartile Biodiversity Scores vs. MSCI APAC IMI Index



Source: MSCI ESG Research. Data as of January 2022.

The top quartile has a higher proportion of companies in industry groups that have fewer biodiversity key issues, such as pharmaceuticals and capital goods, where most companies only face one or two key issues, depending on their activities, and thus face relatively fewer biodiversity risk factors. By contrast, the greatest biodiversity risks are in the **food & beverages** and **materials** industries, with most companies in these industries facing three or more key biodiversity risks.

Of the 220 companies in the food & beverages and materials industries with three key biodiversity-related issues, there were only seven that ranked in the top quartile on all three.

Exhibit 19: MSCI APAC IMI Index Companies in Top Industry Quartile for >2 Key Biodiversity Issues

Company	Market	Sector	Bio. & Land Use Score	Pack. & Mat. Score	Raw Mat. Score	Water Stress Score	Toxic Em. Score
IGO Limited	AU	Materials	4.9			5	4.6
POSCO	KR	Materials	3.4			6.4	5.5
Hokuetsu	JP	Materials			7.2	4.4	5
Mitsubishi Materials	JP	Materials	5.2			4.5	4.4
Allkem	AU	Materials	6.8			5.6	4.3
Nestle (Malaysia)	MY	Cons. Staples		5.8	5.5	7.2	
Marico	IN	Cons. Staples		9.6	5.5	6.9	

Exhibit 20: MSCI APAC IMI Index Companies in Bottom Industry Quartile for >2 Key Biodiversity Issues

Company	Market	Sector	Bio. & Land Use Score	Pack. & Mat. Score	Raw Mat. Score	Water Stress Score	Toxic Em. Score
Fujicco Co	JP	Cons. Staples		0.0	2.7	0.0	
Maeil Dairies Co	KR	Cons. Staples		0.0	2.6	0.0	
PT Delta Dunia Makmur	ID	Energy	0.8			1.8	2.6
Yintai Gold Co.	CN	Materials	0.0			1.9	1.1
Silver Lake Resources	AU	Materials	0.0			0.0	0.9
Jiangxi Copper	CN	Materials	0.0			1.5	0.0
Bellevue Gold	AU	Materials	0.0			0.7	0.0

Source: MSCI ESG Research. Data as of January 2022. JP: Japan, KR: South Korea, AU: Australia, MY: Malaysia, IN: India, ID: Indonesia, CN: Mainland China.

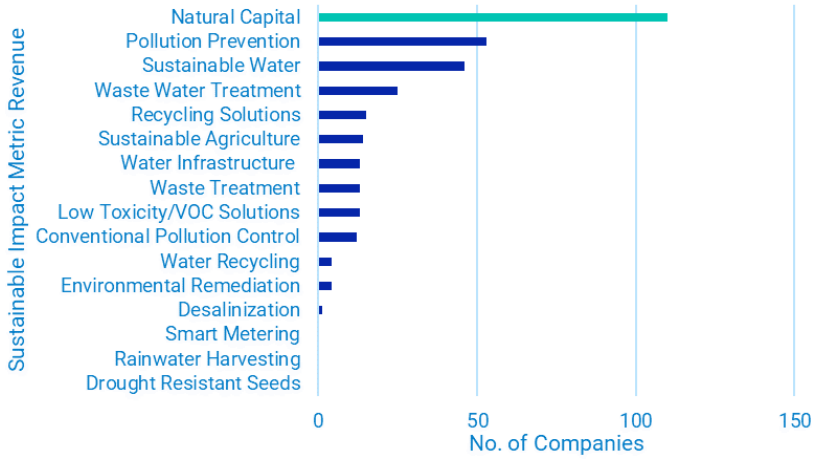
At the other end of the spectrum there are seven companies that ranked in the bottom quartile on all three key issues (Exhibit 20). These companies face the greatest biodiversity risks in the MSCI APAC IMI Index, according to our assessment and scoring methodology.

Biodiversity Opportunities

Looking for investment opportunities to tackle biodiversity problems yields a very different universe than for biodiversity risks. Using our sustainable impact metrics, we can select companies that have high revenue exposure to solutions to biodiversity issues, such as pollution prevention, sustainable agriculture, sustainable water, smart metering or natural capital solutions.

The main concern here is that the investment universe in APAC is not large, with only 110 companies out of 3,579 index constituents with >5% revenue exposure on one of the broadest Sustainable Impact Metrics — Natural Capital Solutions — and even lower numbers for some of the most urgent, such as Water Treatment and Sustainable Agriculture.

Exhibit 21: Number of MSCI APAC IMI Index Companies with Sustainable Impact Exposure >5% Revenue



Source: MSCI ESG Research. Data as of January 2022. Natural Capital is the total number of companies for all of the sustainable impact metrics below.

Looking at the three most common Sustainable Impact Activities — **Pollution Prevention & Control, Sustainable Water,** and **Natural Capital Solutions** — there were 10 APAC companies that had greater than 5% revenue share in all these activities, with these mainly concentrated in the industrials sector.

Exhibit 22: MSCI APAC IMI Index Constituents with >5% Revenue from 3 Main Sustainable Impact Activities

Company	Market	Industry	% of Revenue from Sustainable Impact Activity		
			Pollution Prevention & Control	Sustainable Water	Natural Capital Solutions
Finolex Industries	IN	Chemicals	13.6	66.5	80.1
Metawater.	JP	Machinery	8.5	37.1	45.6
Tsukishima Kikai	JP	Machinery	7.5	33.8	41.3
Daiseki	JP	Comms. Servs.	42.5	30.0	72.5
Kurita Water Industries	JP	Machinery	10.4	22.7	33.1
Beijing Capital Eco-Environment	CN	Water Utilities	17.8	17.3	35.1
Kubota	JP	Machinery	21.5	12.1	33.5
China Everbright Environment	HK	Comms. Servs.	22.7	11.9	34.6
Takuma.	JP	Machinery	23.0	11.5	34.5
Hitachi Zosen	JP	Machinery	7.7	11.2	18.9

Source: MSCI ESG Research. Data as of January 2022. JP: Japan, HK: Hong Kong, IN: India, CN: Mainland China.

In terms of the available investment universe, there is a similar concern on SDG alignment, which covers **SDG 12 – Responsible Consumption & Production, SDG 14 – Life Below Water** and **SDG 15 – Life on Land**. While 63 companies have products, services and revenue that are strongly aligned and 461 aligned with SDG 12, looking at the more focused SDG 14 and SDG 15 categories, there are just 12 companies aligned with SDG 14 and **one** aligned with SDG 15.

Exhibit 23: MSCI APAC IMI Index Constituents Aligned with SDG 14 and 15

Company	Market	Industry	Company	Market	Industry
Beijing Capital Eco-Environment	CN	Water Utilities	**Metawater**	JP	Machinery
Beijing Originwater	CN	Comms. Servs.	**Organo Corporation**	JP	Machinery
China Everbright Environment	HK	Comms. Servs.	**Shanghai Industrial**	HK	Industrial Conglomerates
China Everbright Water	CN	Water Utilities	**Tsukishima Kikai**	JP	Machinery
Daiseki	JP	Comms. Servs.	**TTW Public**	TH	Water Utilities
Kurita Water Industries.	JP	Machinery	**WHA**	TH	Real Estate

Source: MSCI ESG Research. Data as of January 2022.

APAC's Net-Zero Supply Chains

With the majority of the world's supply chains in the APAC region, the risks arising from supply-chain labor standards and controversial sourcing have long been major issues for Asian companies. But to these more traditional supply-chain risks, we now need to add Scope 3 emissions from purchased goods, which can account for up to 80% of total carbon emissions for certain consumer-facing industries. The main industry hit by all these issues at once is technology hardware, where being able to find low-carbon, verifiable suppliers with strong labor standards is an increasing challenge.

Key Industries:

Highest supply-chain risks: automobiles, consumer durables & apparel, retailing, food products, technology hardware

RISKS: We have two main ESG metrics related to supply-chain risk, as well as Scope 3 upstream emissions:

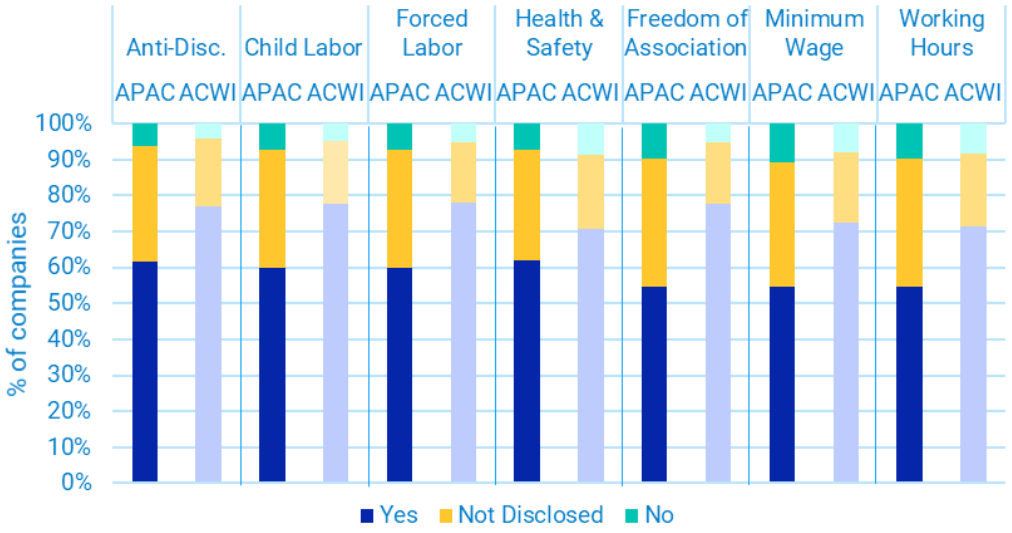
- **Main ESG metrics**: **Supply Chain Labor Standards, Controversial Sourcing, Scope 3 Categories 1 & 2: Purchased Goods**

Supply Chain Labor Standards

The main concern for the supply chains is reporting and disclosure, due both to companies having limited visibility into their full supply network and to an unwillingness by companies to provide the full details of their raw material and product sources. One starting point, if not a perfect one, for assessing which companies are taking their supply-chain issues seriously at a company level is whether they at least have policies related to such issues, particularly on labor standards.

For the APAC region, only around 60% of companies have disclosed policies on the key concerns of forced labor, child labor, anti-discrimination and health & safety, compared with over 75% for constituents of the MSCI ACWI IMI Index. In addition, there is an even lower proportion of disclosed policies on minimum wage, working hours and freedom of association, at just over 50% compared with more than 70% for the MSCI ACWI IMI Index universe.

Exhibit 24: Proportion of Constituents of the MSCI APAC IMI and MSCI ACWI IMI Indexes Disclosing Supply-Chain Labor Management Policies

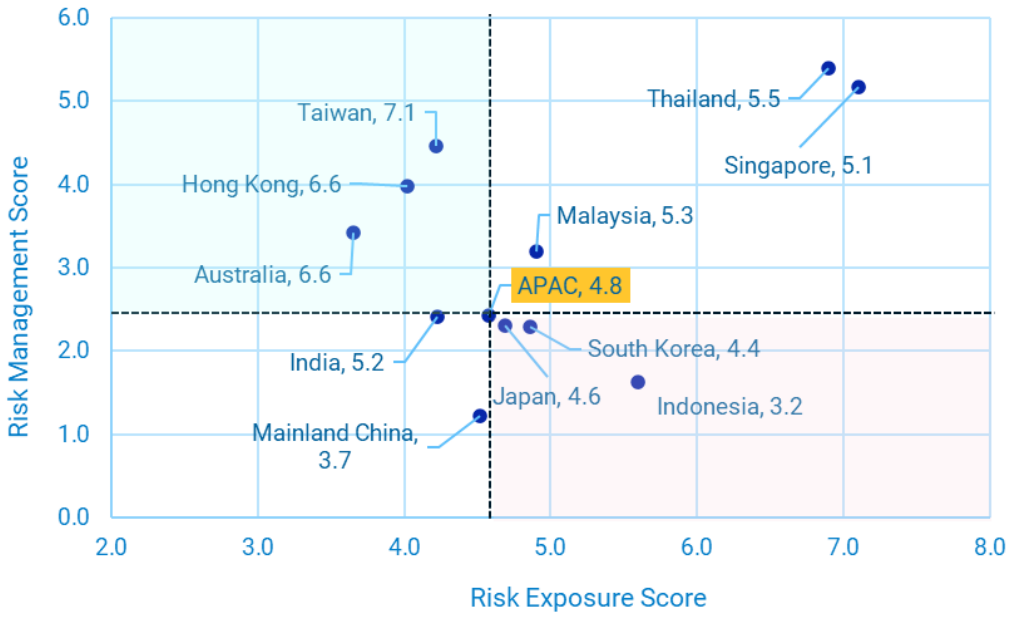


Source: MSCI ESG Research. Data as of January 2022.

A further step beyond basic company reporting on policies related to the supply chain includes considerations such as: 1) how much of the company's supply chain is based in countries with low labor standards; 2) whether the company discloses any efforts to mitigate poor labor practices, and 3) whether the company audits any or all of its Tier 1, 2 and 3 suppliers. At present, only 40% of companies in the MSCI APAC IMI Index audit their Tier 1 suppliers versus 50% for the MSCI ACWI IMI Index, and only 9% audit Tier 2 versus 13% for the global companies.

Looking at supply-chain labor management in terms of risk exposure and risk management shows that the key markets with the highest risk are Indonesia, with an average supply-chain labor management score of just 3.2, as well as South Korea (4.4) and Japan (4.6), while those with the lowest risk are Taiwan (7.1), Hong Kong (6.6) and Australia (6.6). Mainland China has slightly lower risk than the APAC average in terms of exposure, but its companies' management of these risks is still significantly below its APAC peers.

Exhibit 25: Supply-Chain Labor Management Overall, Risk Management and Risk Exposure Average Scores by Market



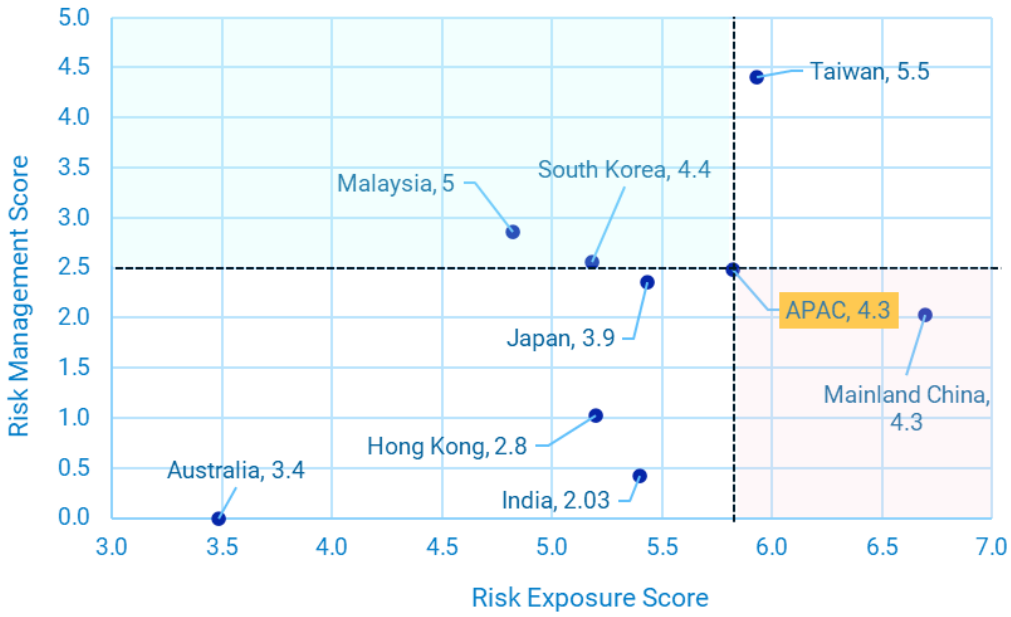
Source: MSCI ESG Research. Data as at January 2022. Average scores by market.

Controversial Sourcing

The second major issue in the supply chain is the sourcing of key raw materials, such as tin, tantalum, tungsten, gold and diamonds, that may come from conflict regions. This primarily affects the **consumer discretionary** and **information technology** sectors, owing to the increasing use of these materials in products such as consumer electronics and autos.

By market, Mainland China has the highest risk exposure to this key issue because of its high level of consumer electronics and auto manufacturing, although companies based in the markets of Hong Kong, India and Australia showed a very low level of risk management on this issue, even if overall they face lower risk exposure.

Exhibit 26: Controversial Sourcing Overall, Risk Management and Risk Exposure Average Scores by Market



Source: MSCI ESG Research. Data as at January 2022. Average scores by market.

Scope 3 Emissions

Added to these more traditional ESG issues is the latest concern over supply-chain reporting and standards: Scope 3 carbon emissions, as highlighted in our 2022 ESG Trends to Watch report. This issue relates particularly to the Scope 3 Categories 1 & 2: Purchased Goods, which covers goods such as high-tech equipment for online retailers, building materials for real estate developers or precious metals for technology hardware companies.

Of all the sectors, **consumer staples** and **real estate** have the highest proportion of Scope 3 (1&2) emissions, with 78% of total carbon emissions for the sector coming from this source, of which food products is the highest (83%). Next is the communication services and technology hardware sectors, with the media industry having one of the highest out of all industries, at 92%, partly owing to its very small Scope 1 & 2 emissions.

By market, this issue represents a reversal of results for the more traditional ESG supply-chain issues, with the more developed markets of New Zealand, Singapore, Taiwan and Japan seeing the highest proportion of Scope 3 (1&2) and India, Indonesia and Malaysia seeing the lowest. This is partly due to the higher proportion of services companies in the former markets, as well as the lower level of Scope 1+2 emissions for individual companies' total carbon emissions.

Exhibit 27: Scope 3 Category 1&2 Emissions as % of Total, by Sector

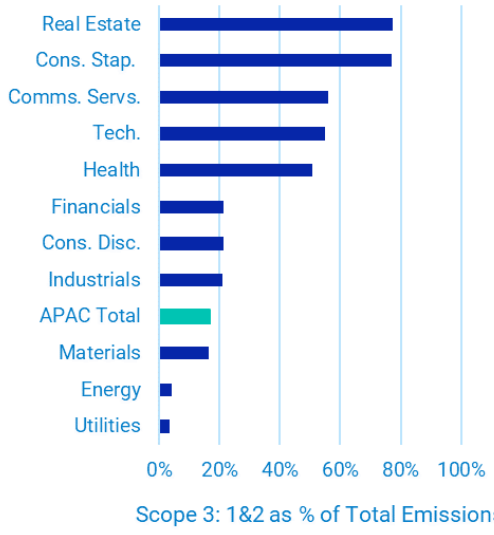
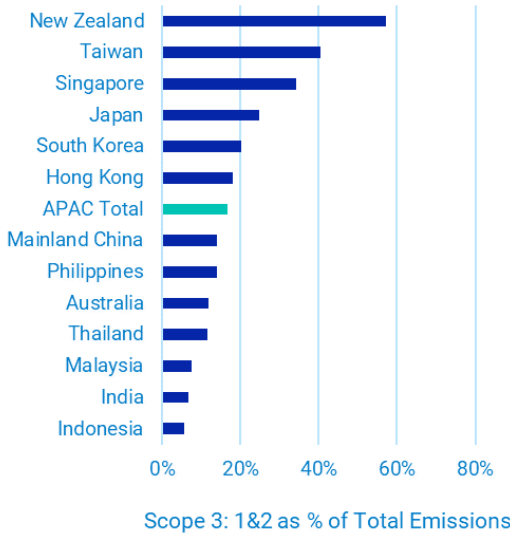


Exhibit 28: Scope 3 Category 1&2 Emissions as % of Total, by Market



Source: MSCI ESG Research. Data as of January 2022.

The Supply Chain Leaders & Laggards

While supply-chain labor standards, controversial sourcing and Scope 3 emissions affect many different industries, the main sector at risk for all three is the **information technology** sector. Regarding labor standards, there have been issues over both forced labor and excessive working hours, while for sourcing, there are increasing risks owing to the greater amount of materials being used in advanced electronics that may come from conflict areas. And around 60% of information technology companies' carbon emissions are from their Scope 3 Purchased Goods category.

The companies that seem to be managing these risks well include the Taiwanese technology hardware companies **Inventec**, **ACER**, **HTC** and **Asustek**, as well as the

Japanese groups **Fujifilm** and **Eizo**. All these companies fall into the top quartile of the APAC universe for managing both supply-chain labor standards (SCLS) and the Controversial Sourcing Key Issue.

By contrast, the main risks are in **Mainland China**, affecting technology hardware companies as well as consumer electronics, household appliances and semiconductors. All these companies fell into the bottom quartile of the APAC universe for both key issues and had similar levels of Scope 3 (1&2) as a proportion of total, but with lower levels of disclosure.

Exhibit 29: APAC Companies in Top Quartile for SCLS & Controversial Sourcing

Company	Market	Industry	SCLS Score	Cont. Sourcing Score	Scope 3 (1&2) as % of Total
Inventec	TW	Tech. Hardware	9.60	5.8	60%
ACER	TW	Tech. Hardware	7.70	9.0	60%
HTC	TW	Tech. Hardware	7.30	6.0	44%
FUJIFILM Holdings	JP	Tech. Hardware	6.70	7.0	28%
EIZO	JP	Tech. Hardware	6.60	7.7	54%
Asustek Computer	TW	Tech. Hardware	6.10	10.0	59%

Source: MSCI ESG Research. Data as at January 2022. SCLS: Supply Chain Labor Standards. TW: Taiwan, JP: Japan.

Exhibit 30: APAC Companies in Bottom Quartile for SCLS & Controversial Sourcing

Company	Market	Industry	SCLS Score	Cont. Sourcing Score	Scope 3 (1&2) as % of Total
GRG Banking Equipment	CN	Tech. Hardware	3.4	2.3	53%
Beijing Roborock Tech.	CN	Household Appliances	3.0	2.3	55%
Shenzhen MTC	CN	Consumer Electronics	2.9	2.3	53%
Dawning Info. Industry	CN	Tech. Hardware	2.9	2.3	58%
Midea Group	CN	Household Appliances	2.6	2.3	n/a
Fujitsu General	JP	Household Appliances	2.6	2.1	31%
Tongwei	CN	Semiconductors	1.4	0.8	75%

Source: MSCI ESG Research. Data as at January 2022. SCLS: Supply Chain Labor Standards. CN: Mainland China, JP: Japan.

Appendix

The tables below look at the highest-risk industries for climate change: food & beverages, materials, energy and utilities, and select companies in the top and bottom quartiles in their industry group for the APAC region (LCT and ITR scores), and whether they are in the top or bottom quartiles globally for LCT Management scores.

Exhibit A1: The Climate Trendsetters: Top-Quartile Companies

Industry Group	Company	Market	LCT Management Score	LCT Score	ITR (°C)
Energy	WORLEY LIMITED	AU	7.5	3.2	2.0
	ENEOS Holdings, Inc.	JP	7.4	3.2	3.2
	SK Innovation Co., Ltd.	KR	6.6	3.0	3.2
Food, Beverage & Tobacco	CJ CheilJedang	KR	5.0	6.0	1.3
	Thai Union Group	TH	4.0	5.9	2.4
Materials	DAIKEN CORPORATION	JP	8.3	6.2	2.1
	TAKASAGO INTERNATIONAL	JP	7.7	5.9	2.3
	Hokuetsu	JP	7.3	6.0	2.3
	ASAHI KASEI	JP	7.0	5.8	2.8
	Daido Steel Co., Ltd.	JP	6.7	5.8	2.1
	Sumitomo Bakelite	JP	6.6	5.7	2.6
	TOYO INK SC	JP	6.6	5.9	2.8
	Rengo Co., Ltd.	JP	6.5	5.9	2.1
	ASIAN PAINTS LIMITED	IN	6.5	5.9	2.8
	Shin-Etsu Polymer	JP	6.3	5.8	2.3
	Yodogawa Steel Works	JP	5.9	5.8	1.9
	FP CORPORATION	JP	5.8	5.8	2.9
	HANWHA SOLUTIONS	KR	5.7	9.5	2.8
	AICHI STEEL	JP	5.7	5.8	1.8
	LINTEC	JP	5.2	5.9	2.8
	SK Chemicals	KR	5.1	6.4	2.8
Utilities	MERIDIAN ENERGY	NZ	9.3	9.1	1.9
	RENOVA, Inc.	JP	8.9	10.0	2.1
	RENEW POWER	IN	8.4	10.0	1.7

Source: MSCI ESG Research. Data as of January 2022. LCT: Low Carbon Transition Score, ITR: Implied Temperature Rise. AU: Australia, JP: Japan, KR: South Korea, TH: Thailand, NZ: New Zealand, CN: Mainland China, IN: India.

Exhibit A2: The Climate Laggards: Bottom-Quartile Companies

Industry Group	Company	Market	LCT Management Score	LCT Score	ITR (°C)
Energy	Yankuang Energy	CN	1.0	0.0	10.0
	COAL INDIA	IN	1.0	0.0	10.0
	China Shenhua Energy	CN	1.3	0.0	10.0
	INNER MONGOLIA YITAI COAL	CN	1.3	0.0	10.0
	Semirara Mining and Power	PH	1.3	0.0	10.0
	Shanxi Lu'an Environmental Energy Dev	CN	1.7	0.0	10.0
	Shanxi Coking Coal Energy	CN	1.7	0.7	10.0
	Guanghui Energy	CN	2.0	0.0	10.0
Food, Beverage & Tobacco	S Foods Inc.	JP	0.0	5.2	4.4
	Maeil Dairies	KR	0.4	5.4	4.6
	CHINA MODERN DAIRY	CN	0.7	4.7	4.1
	Henan Shuanghui Investment & Development	CN	0.8	5.1	4.5
Materials	CHINA HONGQIAO	CN	1.0	2.6	10.0
	LB Group	CN	1.2	3.9	7.3
	Chalco	CN	1.6	4.0	8.4
	Pangang Group Vanadium Titanium & Resources	CN	1.7	4.9	5.0
	Shandong Nanshan Aluminium	CN	1.7	4.7	6.5
	Nine Dragons Paper	HK	1.7	4.3	5.0
	SHOUGANG FUSHAN RESOURCES	HK	2.0	4.8	10.0
	PT Indonesia Asahan Aluminium (Persero)	ID	2.0	0.4	10.0
	Namhae Chemical Corp	KR	2.0	3.7	7.8
	Wanhua Chemical	CN	2.2	3.8	5.7
	PETRONAS CHEMICALS	MY	2.3	4.2	8.8
Utilities	ADANI POWER	IN	1.4	0.2	6.7
	GUJARAT GAS	IN	2.0	2.1	9.9
	SDIC Power	CN	2.5	1.0	6.7
	ADANI TOTAL GAS	IN	3.0	2.1	9.9
	Indraprastha Gas	IN	3.0	2.1	9.9
	NIPPON GAS	JP	3.0	2.1	9.3

Source: MSCI ESG Research. Data as of January 2022. LCT: Low Carbon Transition Score, ITR: Implied Temperature Rise. AU: Australia, JP: Japan, KR: South Korea, TH: Thailand, NZ: New Zealand, CN: Mainland China, IN: India, PH: Philippines.

Exhibit A3: ESG & Climate Data Used in Report

ESG Factor Name in ESG Manager	Short Name
The Coal Conundrum	
Implied Temperature Rise (°C)	ITR
Low Carbon Transition Score	CBN_LCT_SCORE
Low Carbon Transition Management Score	CBN_LCT_MGMT_SCORE
Aggregated Company 2° Climate VaR (2°C AIM CGE & aggressive physical risk scenarios)	AGG2_CLIMATE_VAR
Biodiversity & the Future of Food	
Biodiversity Risks	
Biodiversity & Land Use Score	BIODIV_LAND_USE_SCORE
Packaging Material & Waste Score	PACK_MAT_WASTE_SCORE
Toxic Emissions and Waste Score	TOXIC_EMISS_WSTE_SCORE
Electronic Waste Score	E_WASTE_SCORE
Water Stress Score	WATER_STRESS_SCORE
Raw Material Sourcing Score	RAW_MAT_SRC_SCORE
Biodiversity Opportunities	
SDG 12 - Responsible Consumption and Production - Net Alignment	SDG_12_NET_ALIGNMENT
SDG 14 - Life Below Water - Net Alignment	SDG_14_NET_ALIGNMENT
SDG 15 - Life on Land - Net Alignment	SDG_15_NET_ALIGNMENT
Sustainable Impact Metrics – Max. Percent of Revenue	
• **Conventional Pollution Control Solutions**	CT_POLL_PREV_CONV_POLL_CTRL_MAX_REV
• **Environmental Remediation Solutions**	CT_POLL_PREV_REMEDIATION_MAX_REV
• **Low Toxicity/VOC Solutions**	CT_POLL_PREV_LOW_TOX_VOC_MAX_REV
• **Recycling Solutions**	CT_POLL_PREV_RECYCLING_MAX_REV
• **Waste Treatment Solutions**	CT_POLL_PREV_WASTE_TREATMENT_MAX_REV
• **Pollution Prevention**	CT_POLL_PREV_MAX_REV
• **Sustainable Agriculture**	CT_SUST_AG_MAX_REV
• **Sustainable Water**	CT_SUST_WATER_MAX_REV
• **Desalinization Solutions**	CT_SUST_WATER_DESALINIZATION_MAX_REV
• **Drought Resistant Seeds**	CT_SUST_WATER_DROUGHT_RES_SEEDS_MAX_REV
• **Rainwater Harvesting Solutions**	CT_SUST_WATER_RAINWATER_MAX_REV
• **Smart Metering Devices**	CT_SUST_WATER_SMART_METER_MAX_REV
• **Waste Water Treatment Solutions**	CT_SUST_WATER_WASTE_WATER_TRTMT_MAX_REV
• **Water Infrastructure & Distribution Solutions**	CT_SUST_WATER_INFRA_DISTRIB_MAX_REV
• **Water Recycling Equipment & Services**	CT_SUST_WATER_RECYCLING_MAX_REV
• **Natural Capital**	CT_NAT_CAP_TOTAL_MAX_REV

ESG Factor Name in ESG Manager	Short Name
Net Zero Supply Chains	
Supply Chain Labor Standards Score	SUPPLY_CHAIN_LAB_SCORE
Anti-Discrimination	SUPPLY_CHAIN_LAB_ANTI_DISC
Child Labor	SUPPLY_CHAIN_LAB_CHILD_LABOR
Forced Labor	SUPPLY_CHAIN_LAB_FORCED_LABOR
Freedom of Association	SUPPLY_CHAIN_LAB_FREED_ASSOC
Health & Safety	SUPPLY_CHAIN_LAB_HEALTH_SAFETY
Minimum Wage	SUPPLY_CHAIN_LAB_MIN_WAGE
Paid Overtime	SUPPLY_CHAIN_LAB_PAID_OVERTIME
Controversial Sourcing Score	CONTROV_SRC_SCORE
GHG Emissions - Scope 3 Reported (metric tons)	CARBON_EMISSIONS_SCOPE_3
Total GHG Emissions (Scopes 1, 2 and 3)	CARBON_EMISSIONS_SCOPE123

Source: MSCI ESG Research.

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