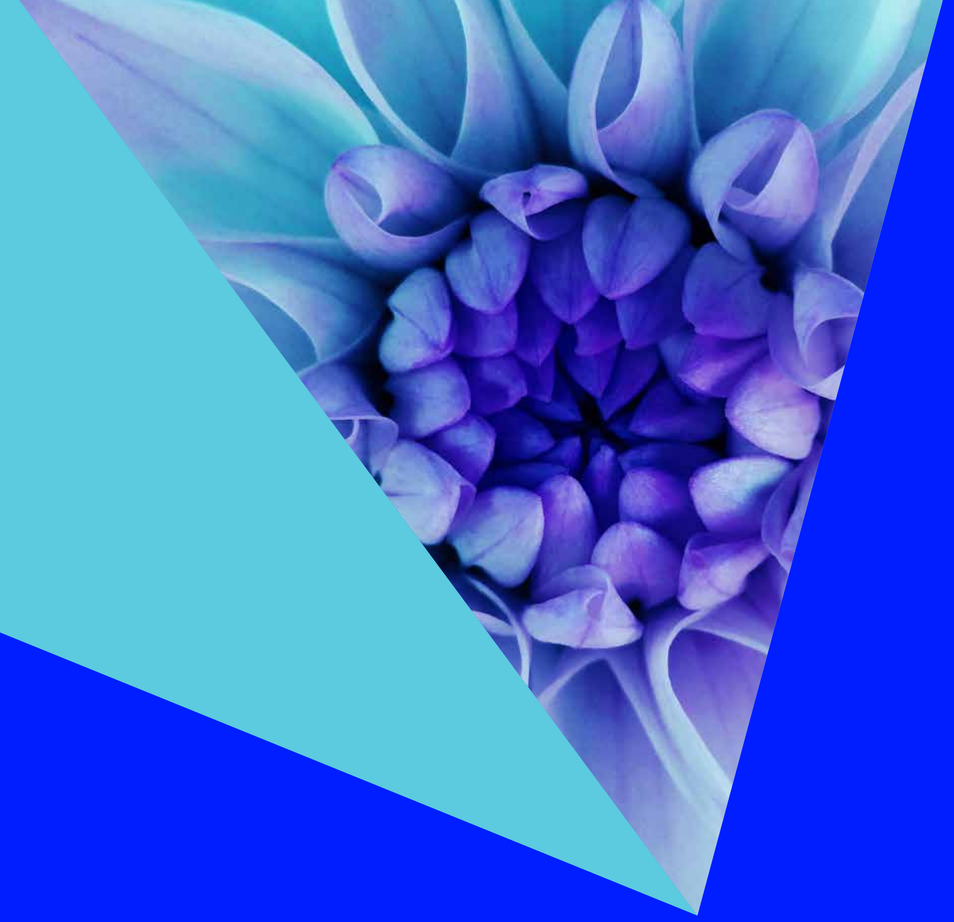

Investing in the green economy 2025

Navigating volatility and disruption

Authors

Lily Dai
Senior Research Lead, Sustainable Investment Research

Lee Clements
Director, Applied Sustainable Investment Research

Alan Meng
Research Lead, Sustainable Investment Research

Beth Schuck
Research Analyst, Sustainable Investment Research

Kieran Brophy
Research Lead, Sustainable Investment Research

Jaakko Kooroshy
Global Head of Sustainable Investment Research

LSEG

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We used various LSEG proprietary sustainable investment data in our analysis, including Green Revenues data, climate data, green bonds data, Lipper fund flows and holdings, commodities and FTSE Russell indices.

Executive summary

LSEG data shows that revenues from green products and services across our coverage now exceed US$5 trillion for the first time.

The global green economy is valued at US$7.9 trillion as of Q1 2025, or 8.6% of listed equity markets. In fixed income, the US$2.9 trillion green bond market has remained robust with record new issuance of US$572 billion in 2024 – a 10% per annum increase.

Short-term performance remains turbulent amid geopolitical tensions, shifting trade policies and rapid technological change, including advances in artificial intelligence. As measured by the FTSE Environmental Opportunities All Share Index, green equities started 2024 underperforming their benchmark, the FTSE Global All Cap Index. However, they recovered in the second half to close the year in line with the market. Year-to-date[1], they have underperformed the market by 3% in challenging market conditions.

Long-term drivers – the energy transition, growing investment in adaptation and resilience, and other environmental pressures – nonetheless continue to underpin strong growth. The market capitalisation of the green economy has expanded at a compound annual rate of 15% over the past decade – second only to the Technology sector. Green equities have delivered 59% of cumulative outperformance since 2008, outperforming their benchmark in 54% of all rolling 12-months and 70% of all five-year periods[2].

If considered a standalone sector, the green economy – now spanning 50 markets globally – would be the 4th largest sector, after Technology, Industrials and Healthcare[3]. Energy Management and Efficiency constitutes both the largest and best-performing sector, representing 46% of the global green economy. While the Americas lead in market capitalisation, Asia generates most of the global green revenues (44%), and green revenues from Emerging Markets are growing nearly twice as fast as Developed Markets.

This year's spotlight chapter examines how increasing spending on adaptation and resilience is emerging as a new growth vector for the green economy. In response to escalating physical climate risk and extreme weather events, governments are establishing adaptation plans and allocating public spending to support their implementation. Corporates are also taking actions with **34% of large and medium-size listed companies referencing adaptation measures in their annual disclosures**[4]. With adaptation finance flows growing at a four-year CAGR of 21%[5], **companies with exposure to adaptation solutions – totalling a green revenue of over US$1 trillion in 2024** – are poised for growth.

The green bond market could provide a useful tool to finance climate adaptation. LSEG analysis of over 12,000 green bonds reveals that over a quarter of the eligible use-of-proceeds categories are linked to adaptation and resilience investments.

> Despite market turbulence, long-term drivers continue to underpin strong growth in the green economy.

The green economy

Valued at

$7.9T

current market value in USD (Q1 2025)

Covers

50

markets & nearly every industry

[1] *As of 15th April 2025.*
[2] *Compared to the benchmark FTSE Global All Cap Index.*
[3] *Based on 'Supersector' under the industry classification system FTSE Russell ICB.*
[4] *In the FTSE All World Index universe, which covers over 4,000 companies across advanced and emerging economies.*
[5] *CAGR refers to compound annual growth rate. Adaptation finance grew from US$35bn in 2018 to US$76 bn in 2022. This includes largely international flows from advanced economies to emerging and developing economies, and finance provided by national development finance institutions. 2022 is the latest year for which comprehensive data is available. Climate Policy Initiative (2024). Global Landscape of Climate Finance 2024.*

Introduction

The green economy consists of companies that provide products and services with environmental benefits – from renewable energy and clean water to energy-efficient buildings and recycling services. These solutions span entire value chains and are essential for addressing climate change as well as broader environmental challenges.

According to LSEG research, addressing climate change will require a cumulative investment of between US$109 trillion to US$275 trillion by 2050, which will flow into the green economy[6].

The **6th edition of the Investing in the Green Economy report** helps investors navigate the short-term volatility and identify long-term growth drivers of the green economy amid ongoing global uncertainty. It examines the size, growth, composition and financial performance of the global green economy across asset classes.

The report is based on LSEG's proprietary Green Revenues data, which provides a bottom-up assessment of more than 20,000 listed companies worldwide. It classifies business activities and quantifies associated revenues across 133 green products and services categories, as defined by the Green Revenues Classification System. The report also leverages FTSE Russell index solutions – which have been powered by green revenues data since 2008 – to enable granular tracking of the performance and valuations of the green economy. In addition, the report uses other proprietary LSEG datasets, including climate data, Lipper fund flows and holdings, fixed income data and commodities data.

The report is divided into five sections

Section 1.
State of the green economy

Overview of the overall size, growth and performance in the short and long term.

Section 2.
Investment characteristics of the green economy

In-depth analysis of performance, valuation and characteristics of green equities and bonds.

Section 3.
Spotlight: Climate adaptation solutions – An emerging industry?

Investment opportunities arising from climate change adaptation.

Section 4.
Investment strategies incorporating the green economy

Green thematic fund flows, green economy exposure of SDR labelled funds and green economy in climate focused indices.

Section 5.
Composition of the green economy

Breakdown of the green economy by industry, region, country and developed vs emerging markets, including green capital expenditure analysis.

[6] *FTSE Russell (2022). Green Equity Exposure in a 1.5°C Scenario.*

1

State of the green economy

The global response to growing environmental challenges has driven a rapid expansion in the green economy.

The green economy has been associated with increased financing of environmental solutions – from reducing greenhouse gas emissions to managing waste and addressing soil, water and air pollution.

Over the past decade, revenues from green products and services within our equities coverage have more than doubled to over US$5.1 trillion in 2024 (Figure 1).

The expansion has been even faster in valuation terms. Between 2014 and 2024, the market capitalisation of the green economy grew at a compound annual growth rate (CAGR) of 15% – second only to the Technology sector, which expanded at 18% CAGR (Figure 2).

As of Q1 2025, the global green economy, if considered as a standalone sector, would account for 8.6% of listed equities with a combined market capitalisation of US$7.9 trillion. This would make it the fourth largest sector by market capitalisation, following Technology, Industrial Goods and Services, and Health Care.

The green economy also extends beyond public equities, encompassing infrastructure, commodities, private equity and fixed income markets. Notably, the green bond market, which finances the procurement of green products and services, reached a record high of US$572 billion annual issuance in 2024, marking a 10% increase from 2023. As of Q1 2025, the total outstanding value of green bonds stood at US$2.9 trillion, which underscores the scale and maturity of this asset class.

Figure 1. Green economy 2009–2025

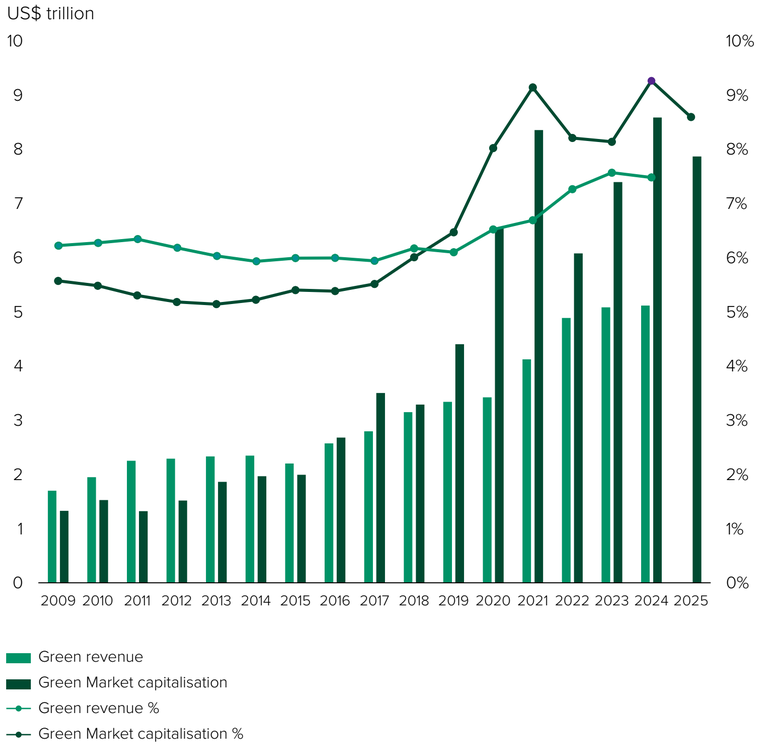
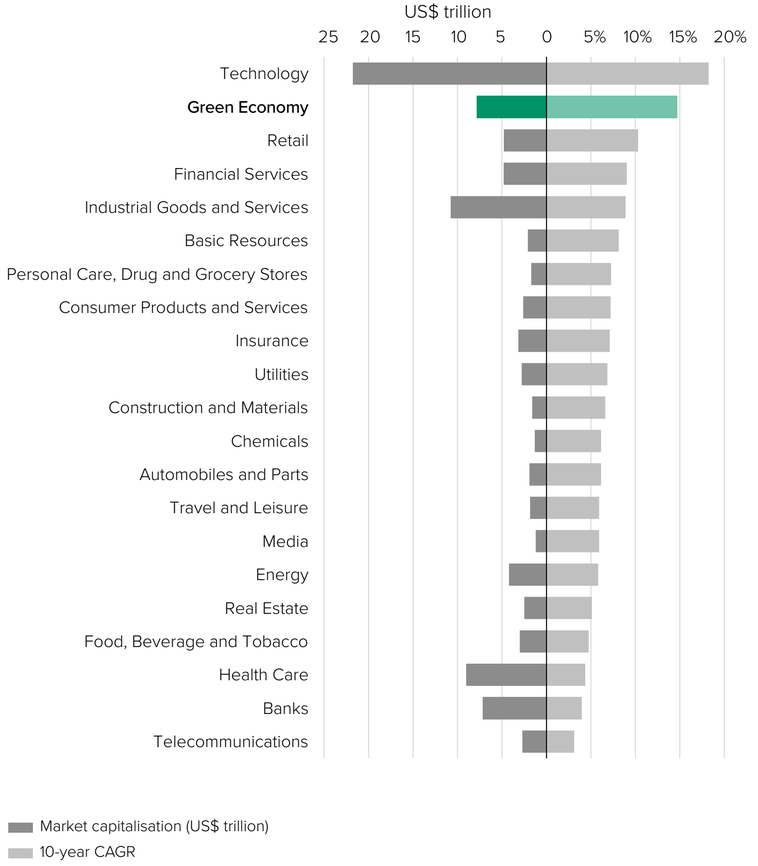


Figure 2. Market capitalisation value and 10-year growth rate – Green Economy compared with ICB sectors



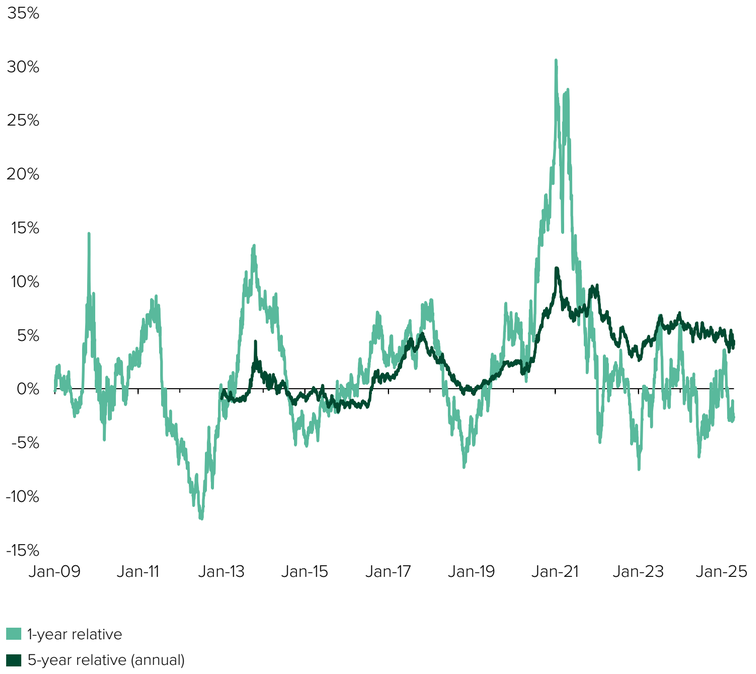
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025. LSEG Revenue data as of December 2024.
Note: Green revenue-weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues. Based on the latest Green Revenues data (financial year 2023 or 2024) and the free float market capitalisation as of April 2025.

Long-term growth amid short-term volatility

Green industries have demonstrated strong long-term performance but remain prone to short-term volatility. They tend to exhibit a positive beta to broader markets and typically outperform during market rallies but underperform in downturns.[7] This pattern is influenced by both the cyclical nature of the capital goods sectors, which form an important part of the green economy, and by shifts in government policy. The latter can amplify market swings through changes in subsidies, regulation and trade policy.

Figure 3 shows the rolling 12-month performance of the FTSE Environmental Opportunities All Share Index (EOAS), a representative basket of green equities and a reliable proxy for the green economy. In 2024, EOAS started the year outperforming its benchmark – the FTSE Global All Cap Index – by 5%, then dropping to -6% in June. It then recovered to finish the year roughly in line with the broader market. In contrast, long-term performance has been more stable, with a five-year annualised rolling return of +5.6% on average since 2020. Since 2008, the EOAS has outperformed the benchmark by 59% (Figure 4).

Figure 3. One-year and five-year rolling relative performance of the green economy



Source: FTSE Russell index performance data from January 2008 to 15th April 2025.

Figure 4. Long-term performance of the green economy vs the market

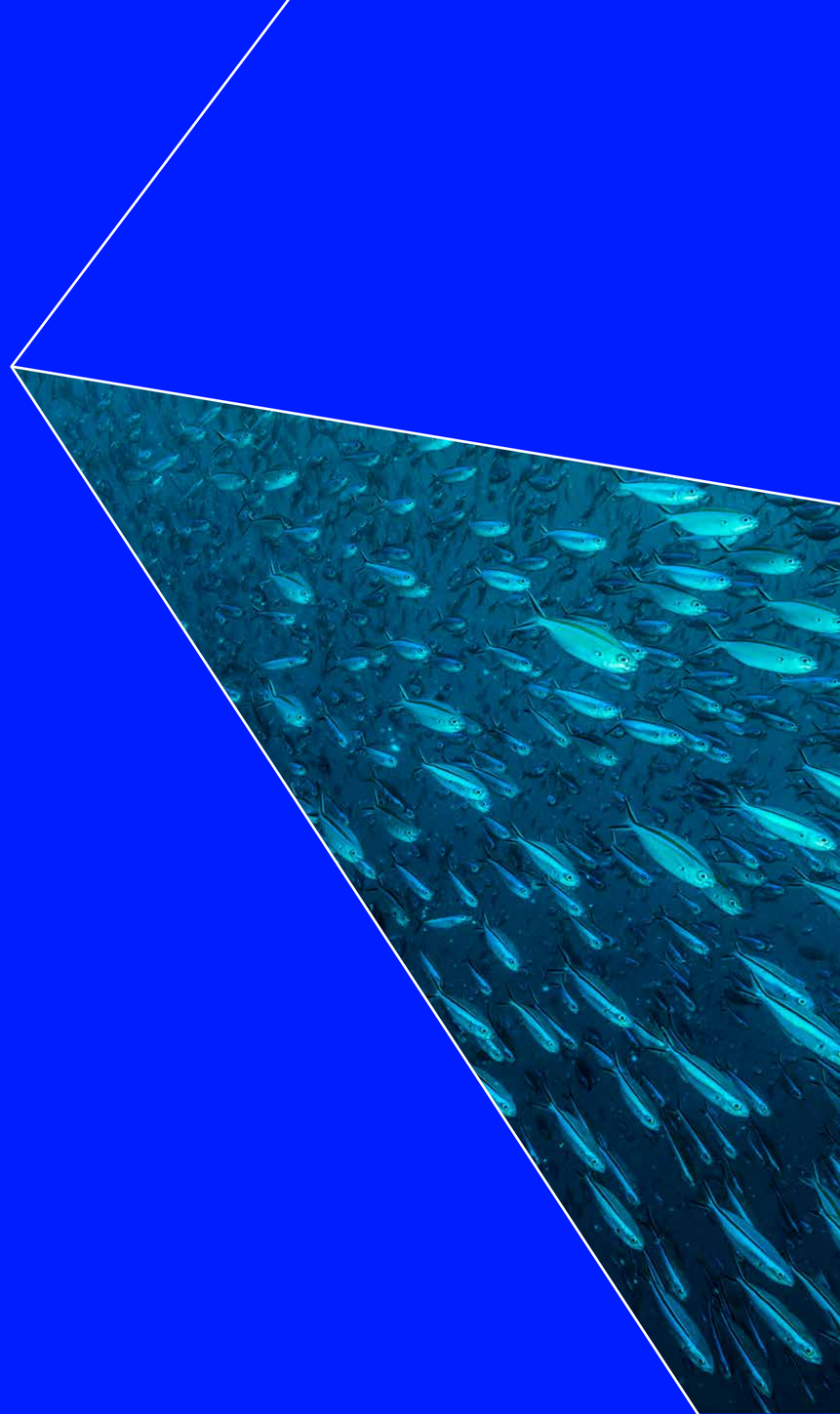
Source: FTSE Russell index performance data from January 2008 to 15th April 2025.

[7] *Examined in Investing in the Green Economy 2023 report.*

2

Investment characteristics of the green economy

Investors can access the green economy through equities with high green revenues, using indices such as the FTSE Environmental Opportunities All Share (EOAS), or through green bonds via benchmarks such as the FTSE Green Impact Bond Index Series.



In general, equities offer greater potential for long-term capital growth but can be more volatile and sensitive to market cycles.

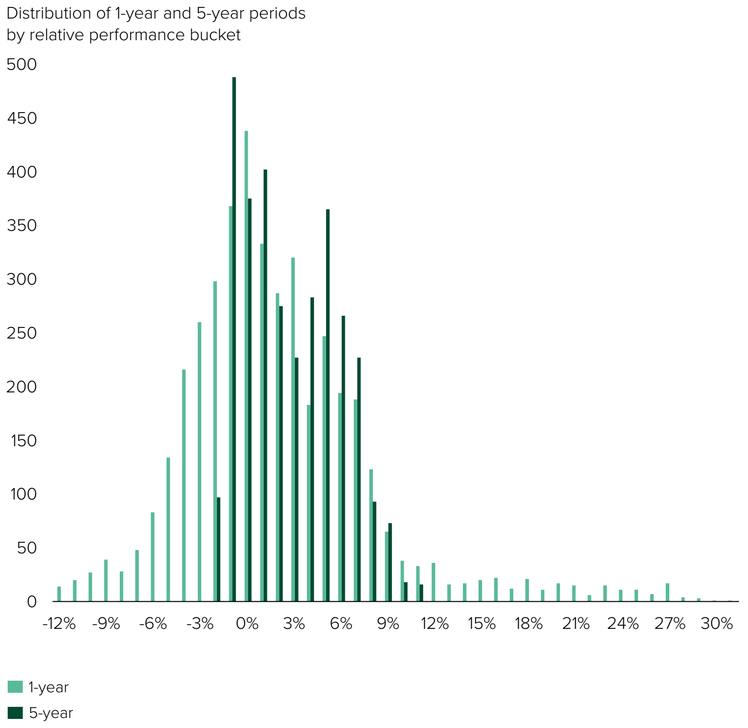
This is also true for green equities, which may provide more upside opportunity, but are likely to be more volatile compared to the broader market. Although green bonds typically have more limited upside than green equities, they usually have less volatile performance, more stable income and lower risk.

Green equities: volatile performance skewed toward positive

This pattern of volatility is illustrated by the FTSE EOAS index that has outperformed its benchmark, the FTSE Global All Cap, by 59% since its launch in 2008 through to 15th April 2025. But the 12-month rolling relative performance has seen large swings, from 31% ahead of the market in early 2021 to 12% behind the market in mid 2012 (Figure 3).

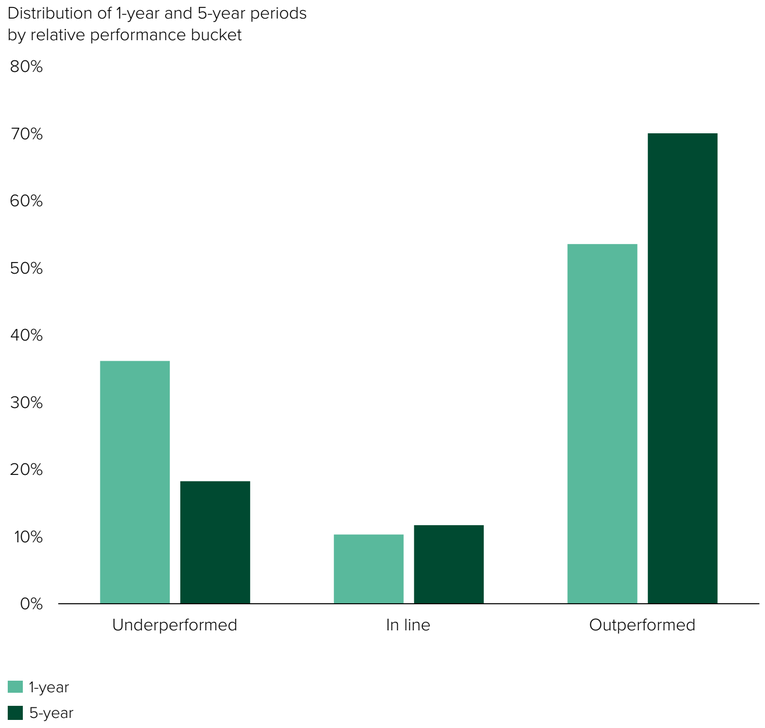
Analysing the distribution of 12-month relative performance for all periods between 2008 and 15th April 2025, shown in Figure 5, we find an average outperformance of +2%, with a long tail of positive relative performance from 2020 and 2021, and a shorter tail of negative performance. When examining 5-year returns, the skew towards positive performance is even more pronounced. Overall, the green economy outperformed for 54% of all the 12-month periods and 70% of all 5-year periods (Figure 6).

Figure 5. Distribution of relative performance of green equities



Source: FTSE Russell data from January 2008 to 15th April 2025

Figure 6. Split of periods out- and underperforming the market over the long term



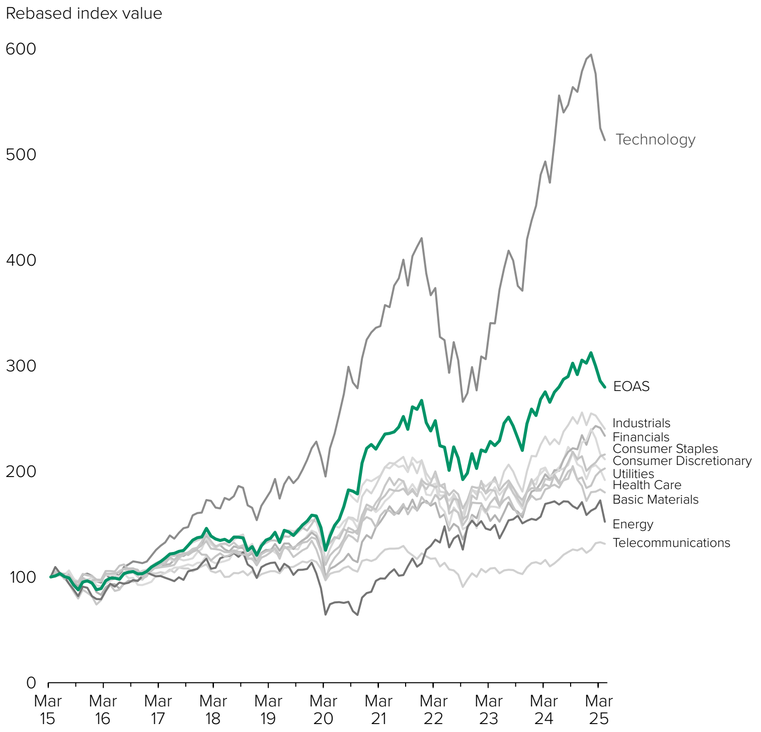
Source: FTSE Russell data from January 2008 to 15th April 2025

Strong overall performance relative to other sectors

These results make the green economy, if considered as a sector, into the second-best performer among ICB Industries in the FTSE All World Index over the last 10 years. In 2024, it was the 4th best-performing sector, after Technology, Financials and Consumer Discretionary.

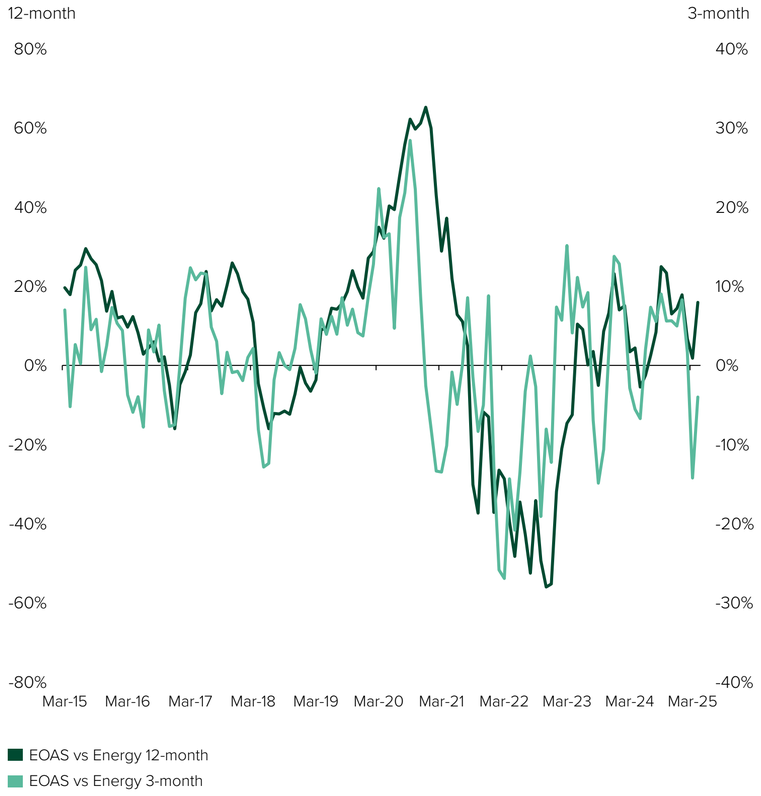
Given the importance of the green economy in energy transition, its performance is often compared with the traditional Energy sector, which is commonly underweighted in sustainable investment portfolios. The green economy outperformed the Energy sector in 2024 and for most of the period since 2022, except for two brief stints of underperformance (trailing 12-month) associated with short-term spikes in oil price. This pattern mirrors the trends observed prior to 2019. In long term, the green economy outperformed the Energy industry by 149% over the 10 years to 15th April 2025, despite underperformance in 2021 and 2022 (Figure 8).

Figure 7. Performance of the green economy vs ICB Industries



Source: FTSE Russell data as of 15th April 2025

Figure 8. Relative performance of green economy vs Energy



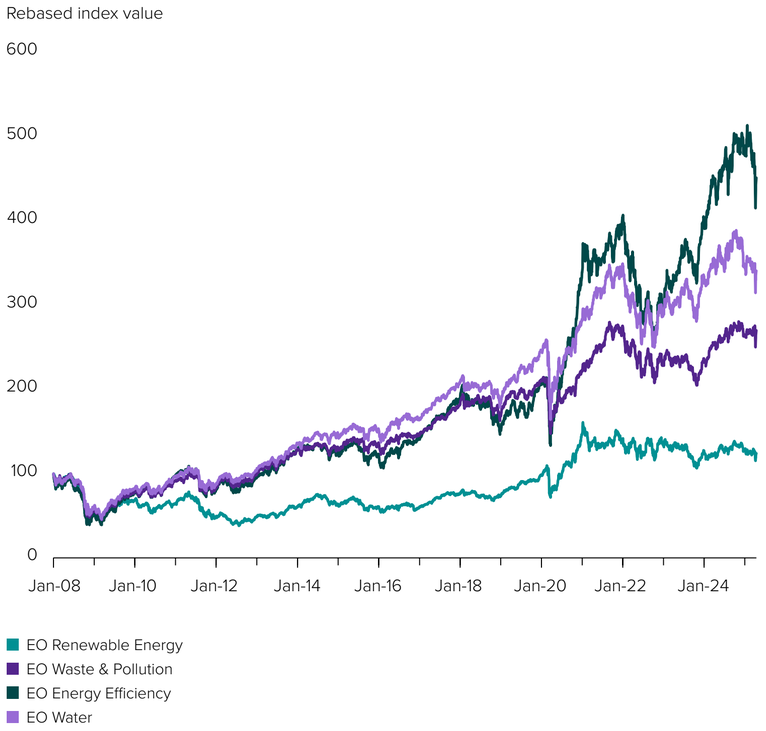
Source: FTSE Russell data as of 15th April 2025

Which parts of the green economy perform best

Another way to analyse the financial performance of the green economy is by comparing the performance of its different sub-sectors, as captured by FTSE Environmental Opportunities Sector Indices[8], shown in Figure 9. The Energy Efficiency sector stands out as the best long-term performer and the top-performing sub-sector in 2024. As the largest sub-sector in the green economy, it covers diverse solutions from building insulation to high-efficiency semiconductor chips.

In contrast, the Renewable Energy sector, despite the sharp rise in global renewables installation rates, particularly for solar power, remains a long-term underperformer. Factors such as interest rate exposure, volatile government support, and falling prices have been impacting the long-term profitability of renewable energy equipment manufacturers.

Figure 9. Performance of the green economy sub-sectors



Source: FTSE Russell data as of 15th April 2025

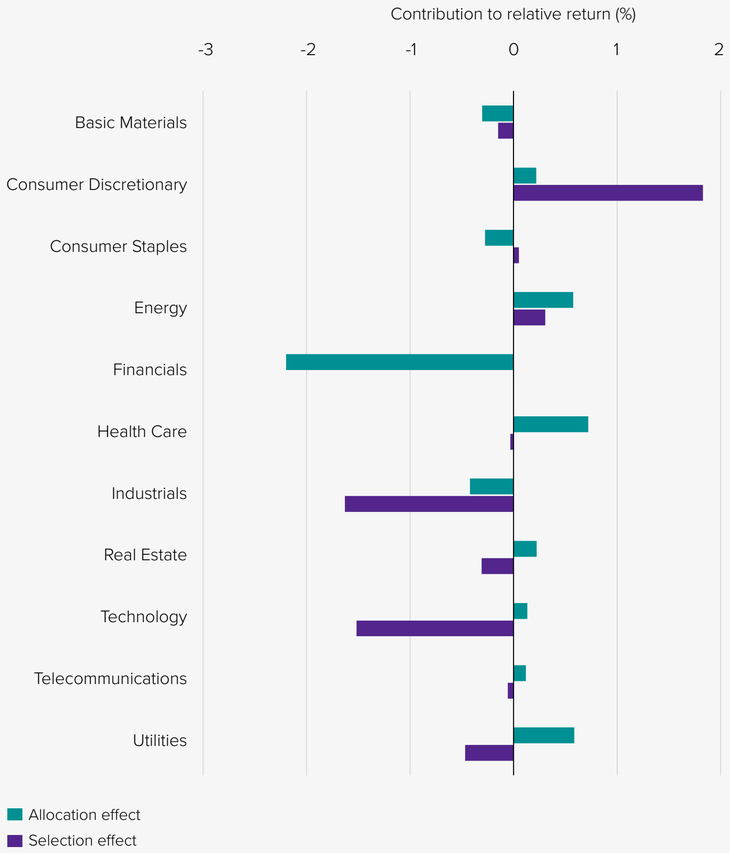
The green economy outperformed the Energy sector in 2024 and has outperformed Energy for the majority of the period since 2022, except for two brief periods of underperformance (trailing 12-month) associated with short-term spikes in oil price.

[8] *Environmental Markets Index Series*

Attributing green economy performance to ICB Industry exposure

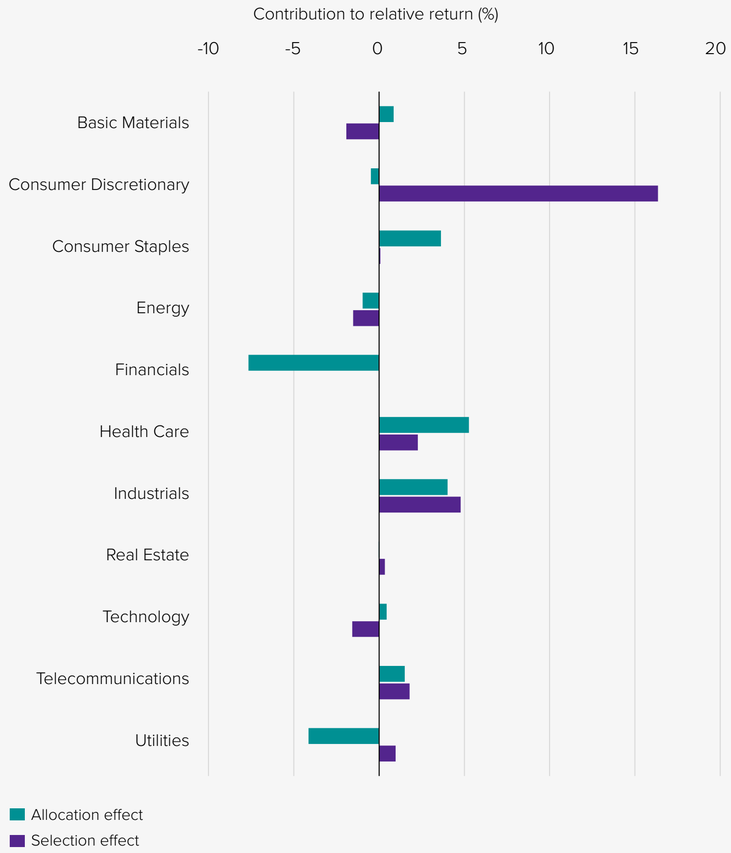
Analysing the green economy through conventional industry classifications such as ICB reveals that companies providing green products and services come from various sectors. This impacts the performance characteristics of the green economy. Using Brinson attribution by ICB Industry, we can understand some of the key drivers of the green economy's performance relative to the broader equity market over one-year and five-year periods. This analysis highlights that exposure to companies involved in energy transition has been the primary driver over the last five years.

Figure 10. One-year attribution of green economy vs FTSE Global All Cap



Source: FTSE Russell data as of 15th April 2025

Figure 11. Five-year attribution of green economy vs FTSE Global All Cap

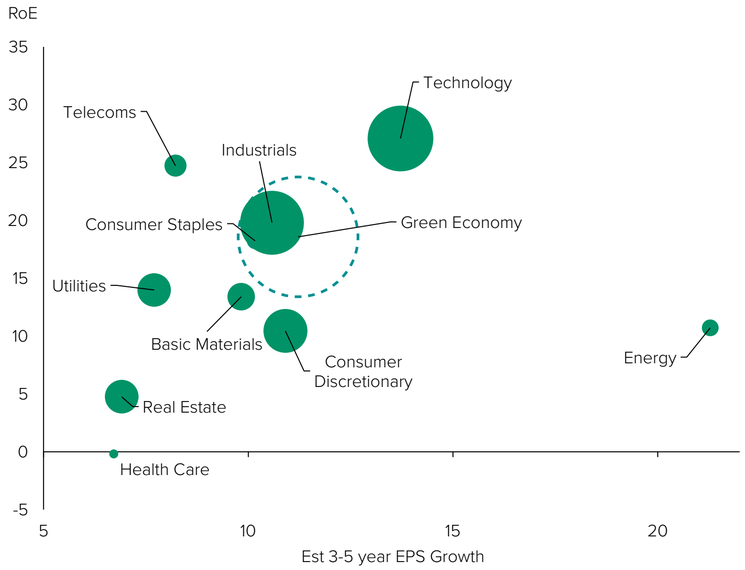


Source: FTSE Russell data as of 15th April 2025

Key drivers of performance have been:

- **Consumer Discretionary**. Electric vehicle companies such as Tesla, Chinese EV manufacturers, and others in the EV supply chain are a key part of this sector, as well as the largest driver of the green economy's performance. While EVs exposure boosted relative performance over one year, it has been weak in Q1 2025. These companies typically have high growth but relatively low RoE, reflecting their early stage of development.
- **Industrials**. As the largest overweight in the green economy, this sector has outperformed due to its exposure to the Energy Efficiency market, which includes electrical equipment, construction materials and infrastructure construction. However, over the past year, Industrials performance has been weak, due to overexposure to North American railroads and a weak property market. The diversified and more developed nature of the sector lead to good growth and RoE.
- **Technology**. A key overweight for the EOAS, this sector includes companies involved in high efficiency semiconductors and cloud computing. Over five years, its overall impact on the green economy's relative performance was neutral, as strong performance from efficiency-focused Technology companies offset the lack of exposure to key AI companies. However, the surging performance of AI companies led to a negative selection effect over the past year. Technology companies typically exhibit both high growth and high RoE.
- **Utilities**. This sector has negatively impacted the green economy's performance due to overexposure to Alternative Electricity, where projects have been delayed, and interest rates have increased costs. As a capital-intensive sector, Utilities companies typically have lower growth and RoE but are often less volatile.
- **Energy**. This sector includes many renewable energy equipment manufacturers, which have faced challenges caused by volatile market and overcapacity that impacts profitability. These issues have led to relatively low RoE, but the sector is expected to see high EPS growth as it rebounds from a low base.
- **Underrepresented industries**. These are important when examining green economy relative performance. EOAS only includes 11% of the FTSE Global All Cap constituents (both by number and by market capitalisation). Certain industries such as Financials, Healthcare and Consumer Staples are underrepresented. While this has had a limited impact on a five-year view, it can have greater impact on short term fluctuations.

Figure 12. Estimated 3-5 year EPS growth vs RoE & size

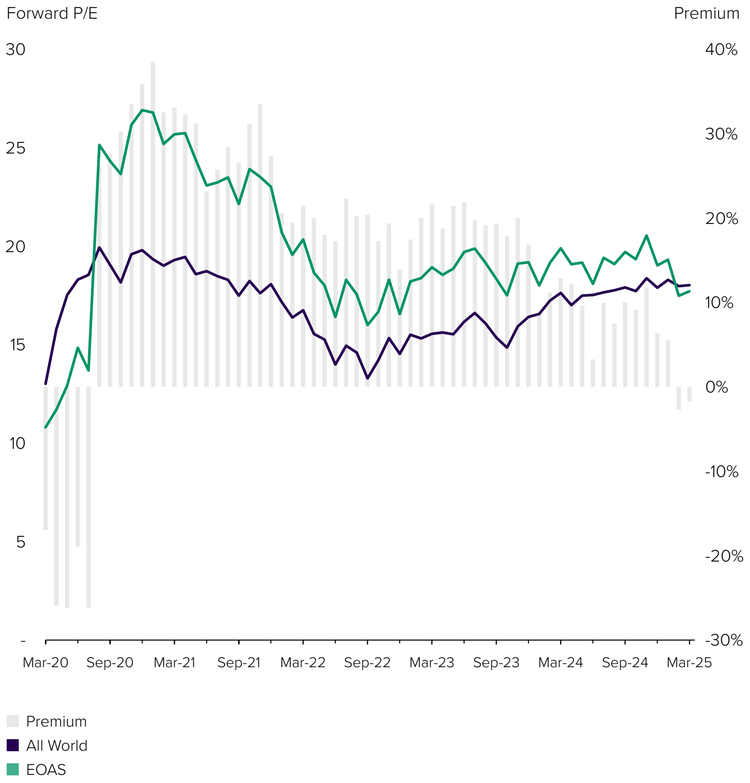


Source: FTSE Russell data as of 15th April 2025

Factor characteristics of green stocks: P/E valuation and EPS growth

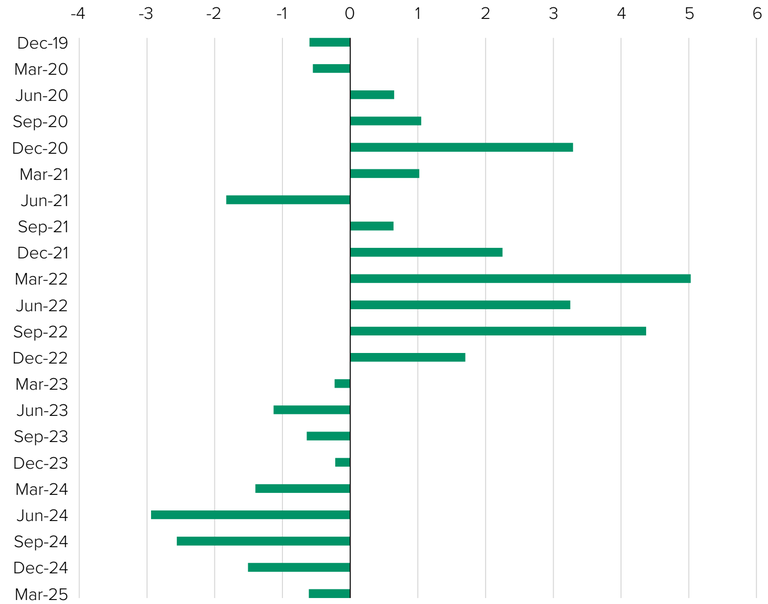
The green economy, as measured by EOAS, has historically been viewed as a high-growth, high-valuation index that benefits from growth opportunities driven by the global energy transition. Its forward price-to-earnings (P/E) premium peaked at nearly 30% in late 2020 and early 2021. This was driven by rising energy transition projections and enthusiasm for green thematic investing, which led to significant fund inflows (see section 4). However, in recent years, that premium has tightened significantly and is currently in line with the broader market.

Figure 13. P/E valuation of the green economy vs the market



Source: FTSE Russell data as of 31st March 2025

Figure 14. Estimated three- to five-year EPS Growth difference between the green economy and the market



Source: FTSE Russell data as of 31st March 2025

Green bond issuance and performance: resilience amid volatility

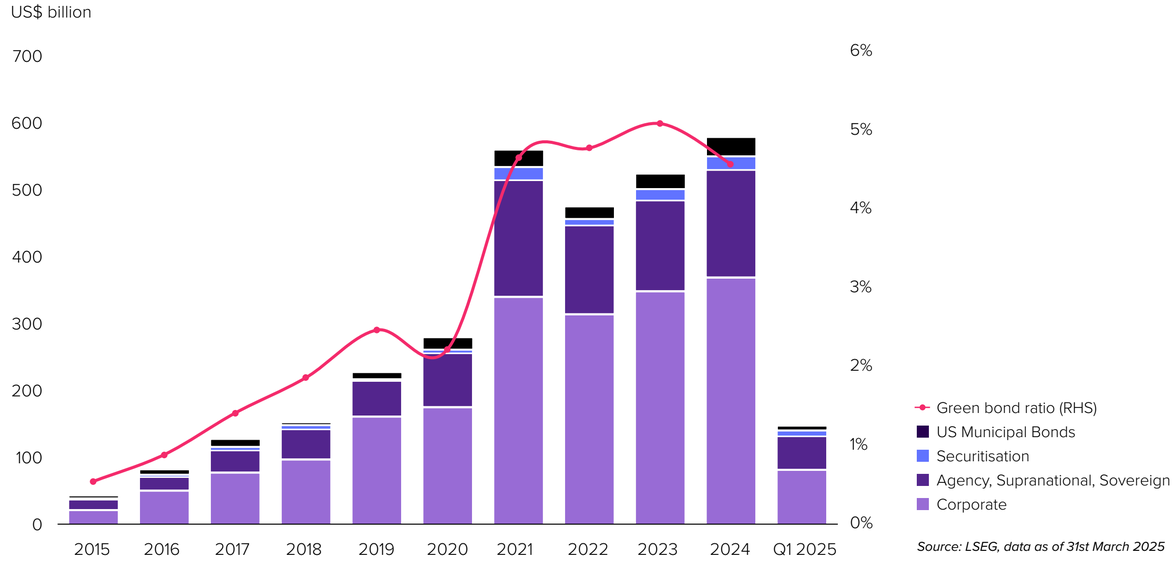
Global green bond annual issuance reached a record US$572 billion in 2024 (Figure 15). This indicates continued investor appetite, even though green bonds still form a relatively small part of the overall annual bond issuances (4.5%).

Corporate issuers remained the largest contributor, accounting for almost two thirds (64%) of 2024 green bond issuance by volume. Amid market volatility, Q1 2025 saw US$146 billion of new green bond issuances (a 13% decline compared to the same period in 2024).

The total outstanding amount of global green bonds reached US$2.9 trillion at the end of Q1 2025, with 61% contributed by corporate issuers and 39% by public sectors (Figure 16).

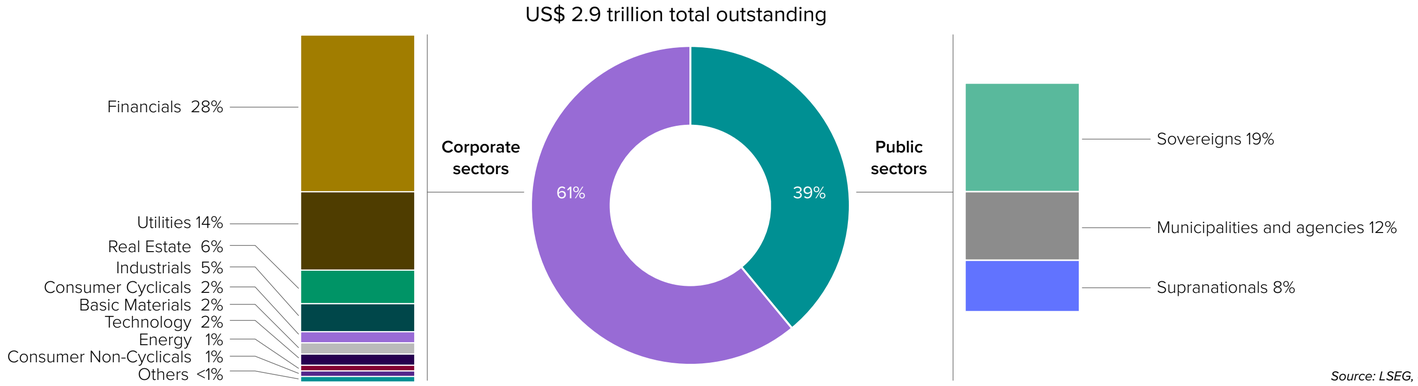
> Global green bond annual issuance reached a record US$572 billion in 2024.

Figure 15. Annual green bond issuance hit record high[9]



Source: LSEG, data as of 31st March 2025

Figure 16. Green bond issuer types



Source: LSEG, data as of 31st March 2025

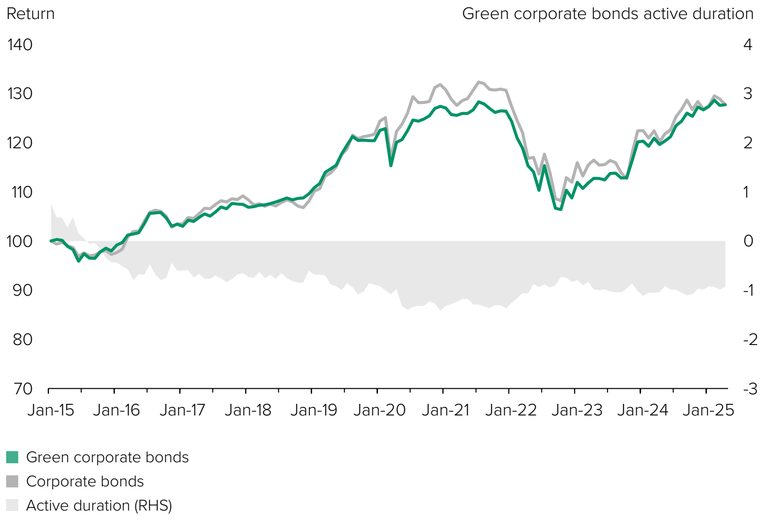
[9] *Note: The annual issuance figures are sourced from LSEG fixed-income databases, which cover different asset classes. Specifically, the annual issuance data is derived from Deal Intelligence and US municipal bond databases, and outstanding volumes are based on GovCorp database. Green bond ratio represents the principal amount of green bonds as a share of the overall newly issued bonds in each year, and it does not include US Muni bonds and securitisations. Other green bond figures have also excluded US Munis and securitisations.*

The 10-year performance of green corporate bonds closely tracks the benchmark,[10] with only a narrow underperformance of 1% as of Q1 2025 (Figure 17).

More recently, green corporate bonds have shown stronger results, outperforming the benchmark by one and two percentage points in 2023 and 2024 respectively (Figure 18). This outperformance was largely driven by their negative active duration, which proved advantageous amid rising interest rates and persistent inflation. Although total returns have trended lower in 2025 due to continued market uncertainty, green corporate bond performance remains broadly aligned with the benchmark.

In contrast, green sovereign bonds have notably underperformed since the beginning of 2022 (Figure 19), primarily due to their longer duration profiles, which have left them more vulnerable to sustained interest rate hikes.

Figure 17. Ten-year performance of green corporate bonds (Jan 2015=100)



Source: LSEG, data as of 15th April 2025

Figure 18. Annual performance of green corporate bonds

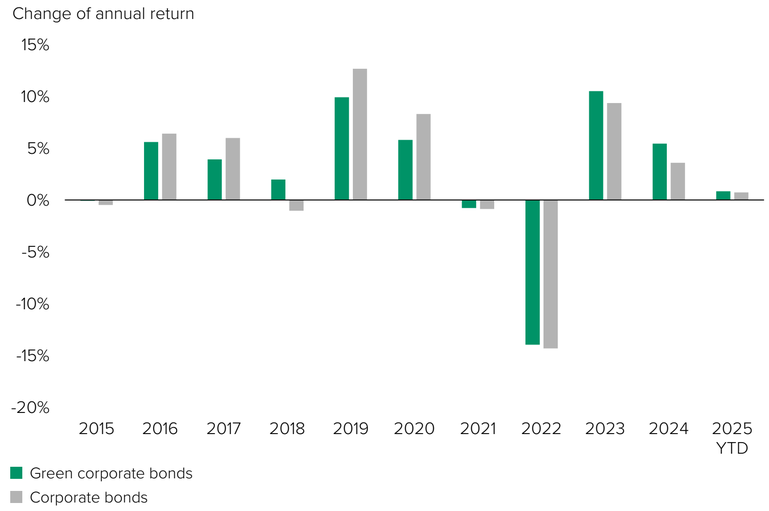
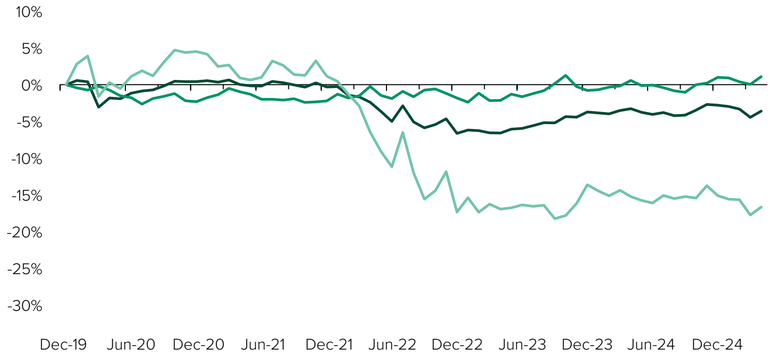


Figure 19. Relative performance of selected sustainable investment green bond indexes



Note: relative performance of WBIG Green, WBIG Green Corp, and WBIG Green Sov are measured against their corresponding benchmarks: WBIG, WBIG Corp, and WBIG Sov.
Source: LSEG, data as of 15th April 2025

[10] *Performance of the green corporate bonds is measured by the FTSE World Broad Investment-Grade Green Impact Corporate Bond Index (WorldBIG Green Corp), and the overall corporate bonds market is measured by FTSE World Broad Investment-Grade Corporate Bond Index (WorldBIG Corp).*

3

Spotlight

Climate adaptation solutions – An emerging industry?

Destructive wildfires in Los Angeles marked the beginning of 2025, destroying over 16,000 structures and causing an estimated US$131 billion in damages.[11]

In 2024, the world experienced more than 200 extreme weather events – ranging from severe droughts in the Amazon to unprecedented rainfall and flooding in the Middle East.[12]

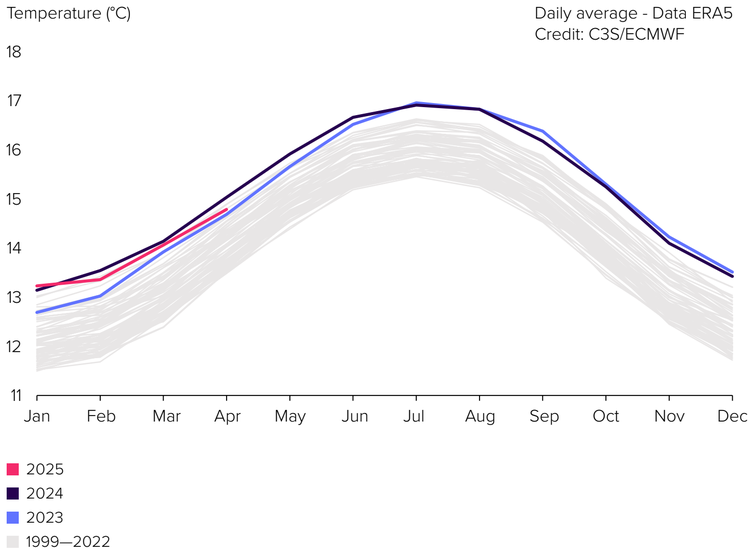
[11] *Direct property and capital losses could range between US$76billion and US$131billion, according to UCLA (2025).* ***Economic Impact of the Los Angeles Wildfires***

[12] *World Weather Attribution (2024).* ***When Risks Become Reality: Extreme weather in 2024***

As these events are expected to increase further both in frequency and severity due to climate change,[13] private sector respondents now rate ‘extreme weather events’ as a top five concern in the short term (two years), and as the biggest risk in long-term (10 years) across 33 global risks identified in the latest Global Risk Survey by the World Economic Forum.[14]

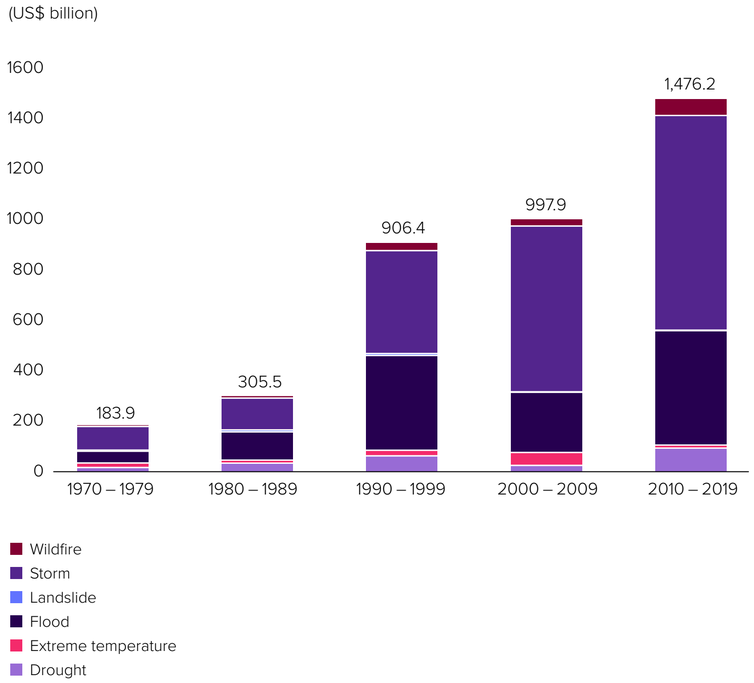
Since the 1990s, climate-related economic losses have surged past US$4.3 trillion (Figure 21) driven largely by damage from flooding and storms.[15] These losses are projected to rise significantly, with recent estimates by Swiss Re suggesting an additional 11–14% of global GDP in losses under the current temperature-rise trajectory of 2.0–2.6 °C by 2050.[16] At the corporate level, businesses may face mounting climate risks, with some companies projected to lose up to 25% of their EBITDA in the next two decades.[17]

Figure 20. Global surface air temperature



Source: Copernicus, March 2025.

Figure 21. Reported economic loss from climate change



Source: WMO, May 2023

[13] *Studies show that 74% of extreme weather events were made more severe or likely by climate change. Carbon Brief (2024). Mapped: How climate change affects extreme weather around the world - Carbon Brief*
[14] *The World Economic Forum (2025). Global Risks 2025: A world of growing divisions*
[15] *WMO (2023). Economic costs of weather-related disasters soars but early warnings save lives*
[16] *Swiss Re Institute (2021). The economics of climate change*
[17] *The World Economic Forum (2024). The Cost of Inaction: A CEO Guide to Navigating Climate Risk*

Adaptation and resilience: the next trillion-dollar industry?

As governments and companies are grappling with these growing challenges, investment in climate resilience and adaptation is beginning to see significant growth – even if spending is currently difficult to track systematically.

In a 2023 LSEG study, we found that 19 G20 members have developed national adaptation plans.[18] A 2024 UNEP study covering a broader sample, found that 171 countries (81%) now have at least one national adaptation planning instrument – including policies, strategies, or plans – in place.[19]

Germany, for example, has moved from voluntary, fragmented measures to mandating all federal and state authorities to develop and regularly monitor adaptation strategies.[20] It has already allocated €2.1–3.4 billion of annual adaptation spending in the 2022 federal budget.[21] Bangladesh – among the most climate-vulnerable countries[22] with a successful track-record of reducing climate-related losses[23] – allocates 6–7% of its budget to adaptation and projects, although significant increases will still be required to achieve long-term resilience.[24]

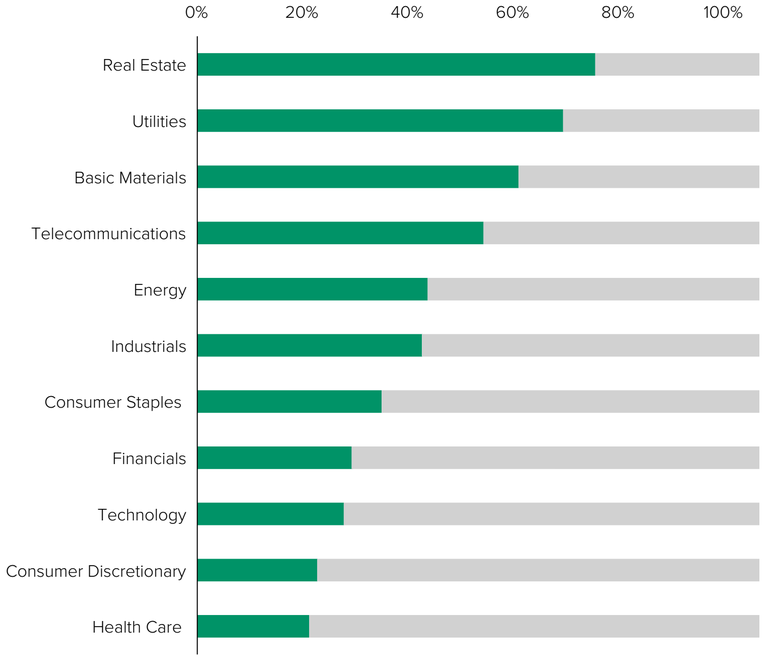
While often still in their infancy, these adaptation plans are evolving rapidly and government investment in climate adaptation and resilience is beginning to scale. Public adaptation finance – including national investments and bilateral and multilateral finance flows – expanded at a compound annual growth rate (CAGR) of 21% between 2018 and 2022, more than doubled from US$35 billion to US$76 billion in 2022.[25] However, this remains small compared to mitigation investments; and covers only a fraction of the US$387 billion in annual adaptation investment required globally, according to UN estimates.[26]

Corporates, too, are beginning to mobilise resources to strengthen the resilience of their operations in response to more frequent and more intense extreme weather events. Based on the latest available LSEG Climate data, 34% of the companies in the FTSE All World Index[27] (covering over 4000 large- and medium-sized publicly listed companies across advanced and emerging economies) now reference adaptation activities in response to physical climate risks in their corporate disclosures.[28]

These measures vary significantly, ranging from generic business continuity planning to specific measures based on assets, location and climate risks. By market capitalisation, the Real Estate sector has the highest uptake (76%), followed by Utilities (70%), Basic Materials (61%) and Telecommunications (55%) (Figure 22).

Among the adaptation measures referenced by companies, flood controls and other form of disaster preparedness are the most common theme. However, companies also cite a broad range of other measures, including improved early warning systems, diversification of supply chains, better insurance as well as energy efficiency improvements. Notably, companies frequently cite attractive cost-benefit ratios for such investments, not only in terms of future avoided losses but also enhanced near-term efficiency.[29]

Figure 22. Share of FTSE All World constituents citing adaptation measures in their corporate disclosures, by ICB Industry



Source: FTSE All World as of 31st March 2025, using latest available LSEG Climate data for FY2023 and FY2024.

[18] *LSEG (2023). COP28 Net Zero Atlas*
[19] *Including policy, strategy or plan. UNEP (2024). Adaptation Gap Report 2024*
[20] *German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (2024). 2024 German Climate Adaptation Strategy*
[21] *Umwelt Bundesamt (2025). Ausgaben des Bundes für die Anpassung an den Klimawandel*
[22] *Germanwatch (2021). Global Climate Risk Index 2021*
[23] *The Guardian (2024). Why Bangladesh is running out of options in the face of extreme weather*
[24] *Bangladesh Ministry of Environment, Forest and Climate Change (2022). National Adaptation Plan of Bangladesh (2023-2050)*
[25] *2022 is the latest year for which comprehensive data is available. This includes largely international flows from advanced economies to emerging and developing economies, and finance provided by national development finance institutions. Climate Policy Initiative (2024). Global Landscape of Climate Finance 2024*
[26] *UNEP (2024). Adaptation Gap Report 2024*
[27] *FTSE Global Equity Index Series (FTSE GEIS)*
[28] Based on LSEG Climate data. The disclosure on adaptation measures is less standardised compared to climate risk assessment where the latter has been improved by the adoption of standards and frameworks such as TCFD and ISSB.
[29] *The World Economic Forum (2024). The Cost of Inaction: A CEO Guide to Navigating Climate Risk*

Box 1

Green bonds: the gateway to adaptation finance

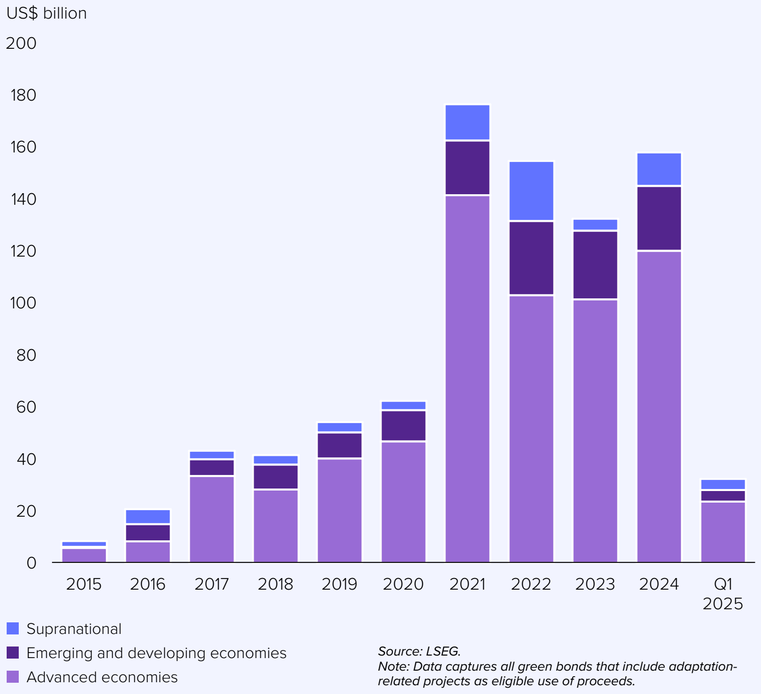
The rapidly expanding US$2.9 trillion green bond market presents an attractive opportunity for governments and businesses to finance climate adaptation – with adaptation spending widely considered as an eligible use-of-proceeds under most national green bond frameworks.[30]

Our review of over 12,000 green bonds in LSEG GovCorp database finds that over a quarter of the eligible use-of-proceeds categories relate in some form to adaptation and resilience investments. This includes most commonly investments in greener and more resilient real estate (e.g. funding improved drainage systems and insulation), followed by projects related to land preservation and resilient agriculture.[31]

While a precise breakdown of use-of-proceeds is usually not disclosed at pre-issuance stage, post-issuance reporting clearly points to the increasing use for financing adaptation measures. Examples include:

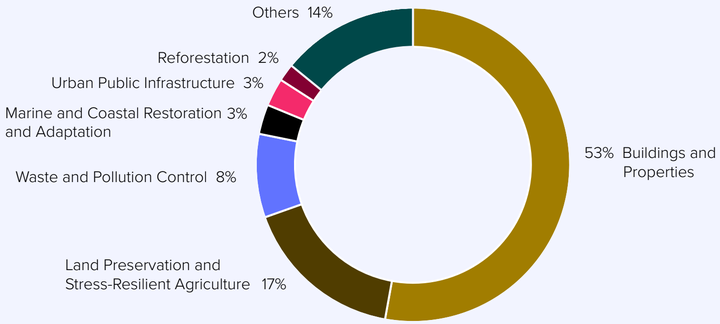
– **The UK**: 12% of the funding raised through the UK's green gilts programme has been allocated to climate adaptation to fund flood and coastal erosion risk management programmes.[32]
– **The Netherlands**: the Dutch Government has issued a series of green bonds to fund the Delta Plan, a set of projects focused on flood defence and freshwater management in response to rising sea levels.[33]
– **Fiji**: a vulnerable small island state, 91% of the proceeds from a green bond listed on the London Stock Exchange in 2018 were allocated to adaptation,[34] including drainage and coastal protection, as well as making infrastructure for 200 schools more resilient to tropical cyclones.
– **Financials, Real Estate and Utilities**: are the top three corporate sectors issuing adaptation-related green bonds. For example, New Zealand's Transpower has allocated proceeds to improve grid resilience by installing drainage to reduce flood risks to substations and transmission lines.[35]
– **Multilateral development banks**: have begun to issue specific adaptation focused bonds, including the AIIB's Climate Adaptation Bond[36] and the EBRD's Climate Resilient Bonds.[37]

Figure 23. Adaptation-related green bond issuance



Source: LSEG.
Note: Data captures all green bonds that include adaptation-related projects as eligible use of proceeds.

Figure 24. Adaptation-related green bond categories



Source: LSEG.
Note: Data captures all green bonds that include adaptation-related projects as eligible use of proceeds.

[30] *Global Center on Adaptation (2021). Green Bonds for Climate Resilience*
[31] *Due to limited issuer disclosures, it is often unclear how much green bond funding is allocated specifically to climate adaptation. We use the green bond use-of-proceeds data in the LSEG GovCrop database, and as an estimate, we include a proportional share of the nominal issuance value of the bond, based on the number of adaptation-relevant categories as a share of the total number of use of proceeds categories.*
[32] *UK Debt Management Office (2024). UK Green Financing Allocation Report 2024. DEFRA refers to the Department for Environment, Food and Rural Affairs.*
[33] *Dutch State Treasury Agency (2024). State of the Netherlands Green Bond Report 2023*
[34] *Reserve Bank of Fiji (2019). Fiji Sovereign Green Bond Impact Report 2019*
[35] *Transpower New Zealand (2024). Transpower Green Bond Report 2024*
[36] *AIIB (2023). AIIB Issues First Climate Adaptation Bond Targeting Resilient Infrastructure*
[37] *EBRD (2023). EBRD Climate Resilience Bond Framework*

Using the LSEG GRCS to track companies with exposure to adaptation solutions

As spending on adaptation and resilience by governments and corporates is beginning to scale, there is growing investor interest to identify companies with exposure to adaptation solutions.[38]

However, identifying revenues linked to adaptation efforts can be complex. In contrast to mitigation solutions that substitute more carbon-intensive products – such as electric vehicles, wind turbines or heat pumps – adaptation solutions rarely consist of discrete products. Instead, adaptation measures typically benefit a range of industries and products that link to a broad set of demand drivers and often offer a range of co-benefits, including higher efficiency and lower environmental impacts.

This can make it difficult to isolate the impact of adaptation from other demand drivers. In recent years, there has been several efforts to develop better definitions for adaptation solutions. A recent survey study from Oxford University identifies over 24 recently published adaptation taxonomies, each varying in terms of definitions, categories, sector scope, criteria and use cases.[39] While this body of research has significantly advanced our theoretical understanding of adaptation solutions (see Box 2), empirical research tracking adaptation-related revenues has been limited to date.

> With a market capitalisation of US$454 billion, green buildings are the largest green sector with exposure to adaptation solutions.

[38] *Jefferies (2025). Resilient Returns: The Investment Case for Climate Adaptation.*

[39] *Research from Spacey Martín, R., Ranger, N., and England, K. The (in)coherence of adaptation taxonomies (June 24, 2024). DOI: http://dx.doi.org/10.2139/ssrn.4874598 analyses 24 taxonomies for adaptation activities. This paper includes an additional taxonomy developed by the Climate Policy Initiative for tracking private adaptation financing. Tracking and Mobilizing Private Sector Climate Adaptation Finance - CPI*

Box 2

Adaptation taxonomies

While most taxonomies focus on climate change mitigation, those dedicated to adaptation activities are overall still relatively new and less mature.[40] Prominent examples of the most comprehensive taxonomies include those from the Climate Bonds Initiative, Tailwind and Climate Policy Initiative.

They commonly distinguish between **adaptation measures** and **adaptation solutions**. Some taxonomies also include ‘adapted’ activities – where an activity becomes adapted after specific measures are taken.[41] Many of these definitions stress that adaptation solutions can be context dependent and emphasise the need for physical climate risk assessments as a key step towards in defining adaptation solutions.[42]

We also find that approaches to defining adaptation solutions vary widely: some taxonomies list over 100 specific adaptation activities, while others take a more flexible approach, offering guiding principles and assessment approaches instead. Similarly sectoral coverage can vary. Most adaptation taxonomies include sectors like Food and Agriculture, Forestry, Water and Health, but there is some variability. For example, the EU taxonomy focuses on high-carbon sectors and has been critiqued as an "adaptation of mitigation activities" taxonomy, missing key adaptation sectors such as agriculture.[43]

Adaptation measures
Actions taken by companies to improve the climate resilience of their own business activities, assets or the broader ecosystem. For example, installing flood control equipment to protect infrastructure.

Adaptation solutions
Products and services produced by companies that enhance the climate resilience of end users. For example, manufacturing flood control equipment for external use.

> Prominent examples of the most comprehensive taxonomies include those from the Climate Bonds Initiative, Tailwind and Climate Policy Initiative.

[40] *Research from Spacey Martín, R., Ranger, N., and England, K. The (in)coherence of adaptation taxonomies (June 24, 2024). DOI: http://dx.doi.org/10.2139/ssrn.4874598 analyses 24 taxonomies for adaptation activities. This paper includes an additional taxonomy developed by the Climate Policy Initiative for tracking private adaptation financing. Tracking and Mobilizing Private Sector Climate Adaptation Finance - CPI*
[41] *For example, resilience Taxonomy from the Climate Bonds Initiative (2024). Climate Bonds Resilience Programme*
[42] *OECD (2022). Climate-resilient finance and investment*
[43] *Ibid.*

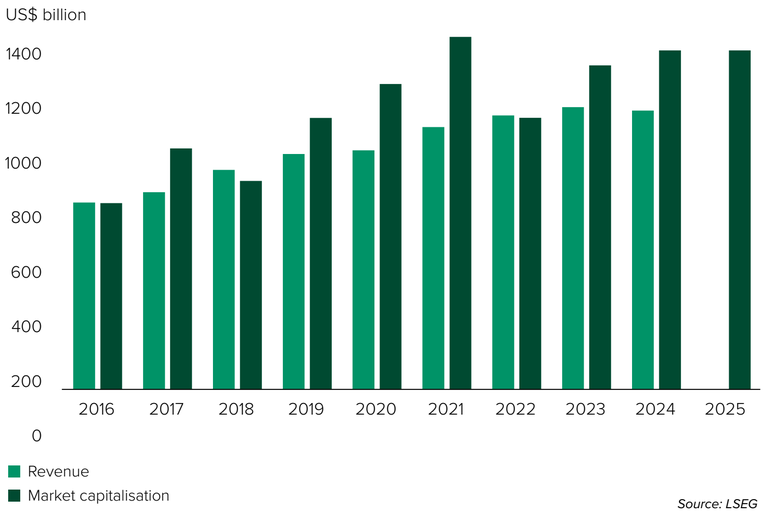
The LSEG Green Revenue Classification System (GRCS) is uniquely suited to track companies with exposure to adaptation solutions due to:

- its comprehensive and systematic coverage of 133 green business activities (or ‘microsectors’);
- its explicit integration of adaptation-specific activities such as Flood Control and Natural Disaster Response;
- bottom-up analysis of revenues for a large coverage universe of over 20,000 listed companies with history from 2016.

35 microsectors, or approximately a quarter of all activities covered in the GRCS, contribute to climate adaptation (Appendix 1). These range from solutions dedicated to adaptation, such as flood control, to broader activities such as green buildings or waste management.

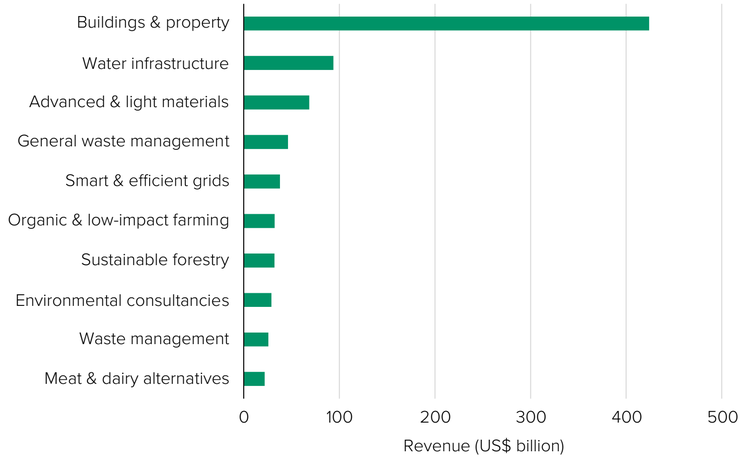
Leveraging this unique dataset, we have identified over 2,100 companies that generated over US$1 trillion in revenues from products and services that contribute to climate adaptation, accounting for roughly one fifth of the global green economy in 2024 (Figure 25). With a revenue of US$424 billion, green buildings are the largest green sector with exposure to adaptation solutions (Figure 26). This is followed by water infrastructure at US$94 billion, which is often a key area for post-disaster recovery. Dedicated adaptation solutions are still much smaller, ranging from US$17 billion (flood control) to US$1 billion (land erosion).

Figure 25. Size of adaptation solutions



Source: LSEG

Figure 26. Top-10 adaptation solutions

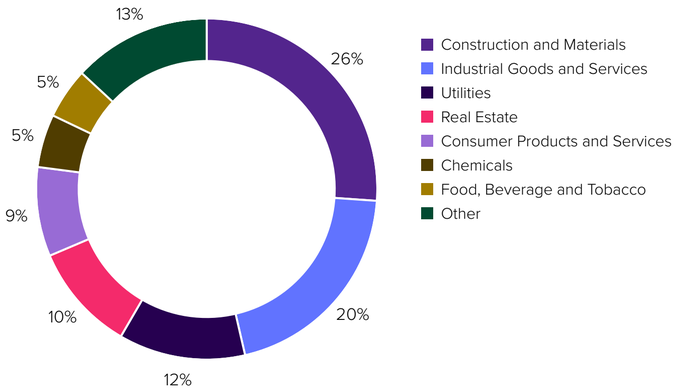


Source: LSEG

Adaptation solutions are provided by companies across various industries, primarily from Construction and Materials, Industrial Goods and Services, and Utilities sectors (Figure 27). These industries are vital in driving infrastructure development and providing the physical resources necessary for effective climate adaptation.

Table 1 provides examples of companies with revenue exposure to adaptation solutions (full assessment in Appendix 2).

Figure 27. Adaptation solutions revenue by industry



Source: LSEG

Table 1. Examples of companies with revenue exposure to adaptation solutions

Example 1: Thales	Example 2: Raito Kogyo
Green Revenue related to adaptation: 5.6% **GRCS micro sector related to adaptation:** Meteorological Solutions Thales' adaptation green revenues come from manufacturing meteorological satellites, such as Meteosat, used for long-term monitoring of climate change. It is part of the Aerospace business. The majority (53%) of company revenue comes from its Defence and Security business.	**Green Revenue related to adaptation: 31.1%** **GRCS micro sector related to adaptation:** Land Erosion, Land and Soil Decontamination Services and Devices Raito Kogyo's adaptation green revenues are generated by slope construction projects that prevent debris falls, slope failures, and landslides, and environmental restoration projects targeting soil and ground water pollution. The company specialises in civil engineering work.
Example 3: Beijing Originwater Technology	**Example 4: Clean Harbor**
Green Revenue related to adaptation: 52.6% **GRCS micro sector related to adaptation:** Desalination, Water Treatment Equipment, Hazardous Waste Management, Water Treatment, Environmental Consultancies, Waste and Pollution Control Waste Management, Sea and Water Decontamination Services and Devices, Water Infrastructure, Flood Control Beijing Originwater Technology's adaptation revenues stem from water-related activities, covering areas like drainage engineering, river basin management and seawater desalination. 97.6% of the company's revenue is generated by green products and services.	**Green Revenue related to adaptation: 76.9%** **GRCS micro sector related to adaptation:** Waste Management, Natural Disaster Response, Land and Soil Decontamination Services and Devices, Hazardous Waste Management, Water Treatment Clean Harbor's green revenue comprises various adaptation solutions such as debris removal and disposal services for managing natural disasters like earthquakes and hurricanes, and spill cleanup on land and wetland restoration. The company is a pure play with over 97% of its revenue generated from green products and services.

4

Investment strategies incorporating the green economy

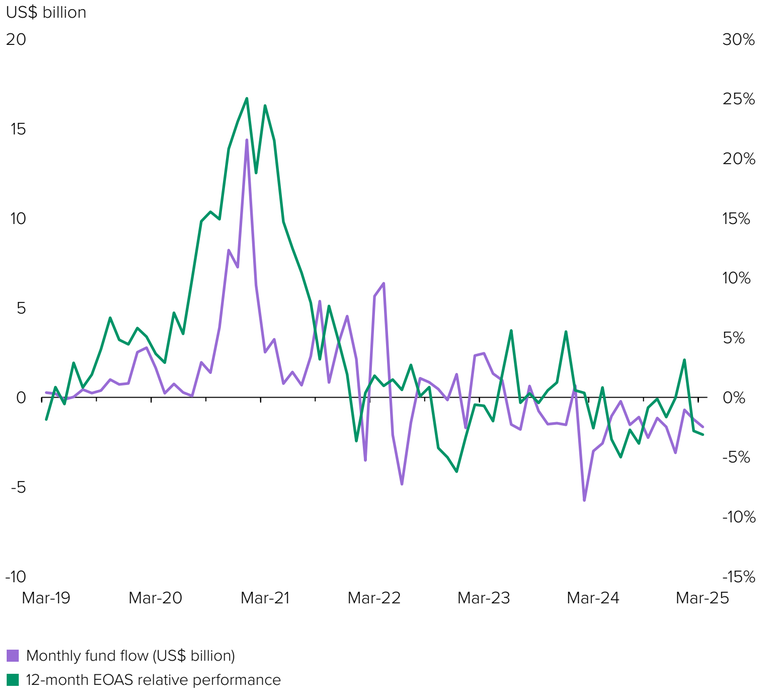
The green economy is a key investment theme for many investors who focus on the growth opportunities associated with solutions to environmental issues. To create broader climate and sustainable investment strategies, investors can focus directly on green equities through thematic funds or baskets, or incorporate green revenues alongside other sustainable investment data, such as carbon intensity or transition scores.

Green thematic flows

Green thematic funds focus on investing in companies that are involved in Alternative Energy and Water sectors.

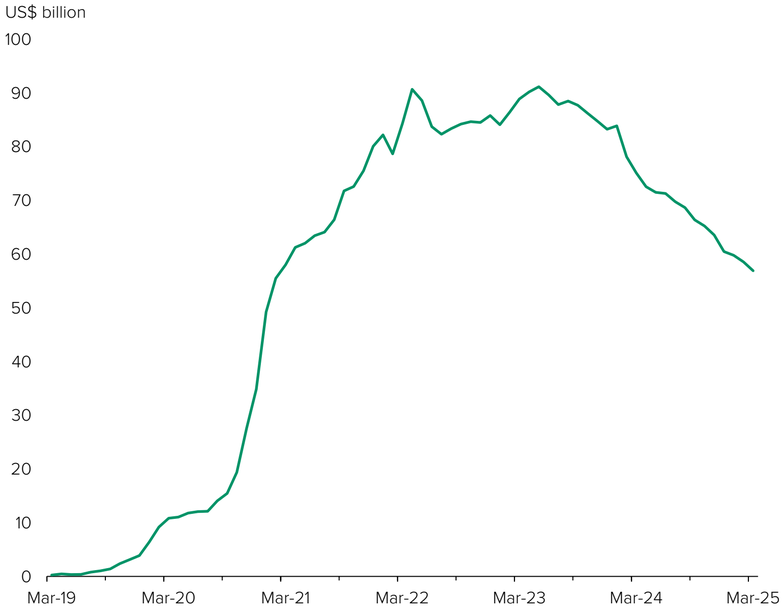
As captured in the Lipper Equity Theme, renewable energy and water thematic funds[44] saw strong inflows in 2020 and 2021 and had US$74bn of assets at the end of Q1 2025. However, flows flattened in 2022 and 2023 and changed to outflows in 2024 and early 2025 as the green economy underperformed broader markets (Figure 28). Cumulative outflows nonetheless remained relatively small compared to the cumulative inflows in 2020 and 2021 (Figure 29).

Figure 28. Fund flows into renewable energy and water thematic equity funds vs green economy performance



Source: FTSE Russell and LSEG Lipper data to 31st March 2025

Figure 29. Cumulative fund flows into renewable energy and water thematic equity funds



[44] *'Alternative Energy' and 'Water' funds according to Fund Classifications | Lipper Alpha Insight*

SDR-labelled funds' exposure to the green economy

In addition to the green thematic funds above, a broader range of funds have adopted the UK's Sustainability Disclosure Requirements (SDR) labels while pursuing various sustainability objectives, with some of them incorporating the green economy.

Introduced by the UK's Financial Conduct Authority in November of 2023, the SDR framework aims to enhance transparency in sustainable investment products and mitigate the risk of greenwashing. Under this framework, UK funds that meet specific criteria can adopt one of four sustainability labels aligned with their investment objectives:

- **Sustainability focus**: For funds aiming to invest in assets that are classified as environmentally and/or socially sustainable against a robust, evidence-based standard.
- **Sustainability impact**: For funds aiming to achieve a measurable positive impact in relation to an environmental or social outcome.
- **Sustainability improvers**: For funds investing in assets that are expected to improve their sustainability performance over time.
- **Sustainability mixed goals**: For funds that integrate elements of the other three labels.

To assess the exposure of SDR-labelled funds to the green economy, we use the Weighted Average Green Revenue (WAGR) metric. WAGR calculates the percentage of green revenue in a portfolio by multiplying each constituent company's green revenue percentage by its portfolio weighting.[45]

Our analysis covered a sample of nine SDR-labelled funds and compared their WAGR to two FTSE Russell benchmarks: FTSE EOAS, which selects companies with over 20% green revenues, and FTSE All World, the broad market benchmark.

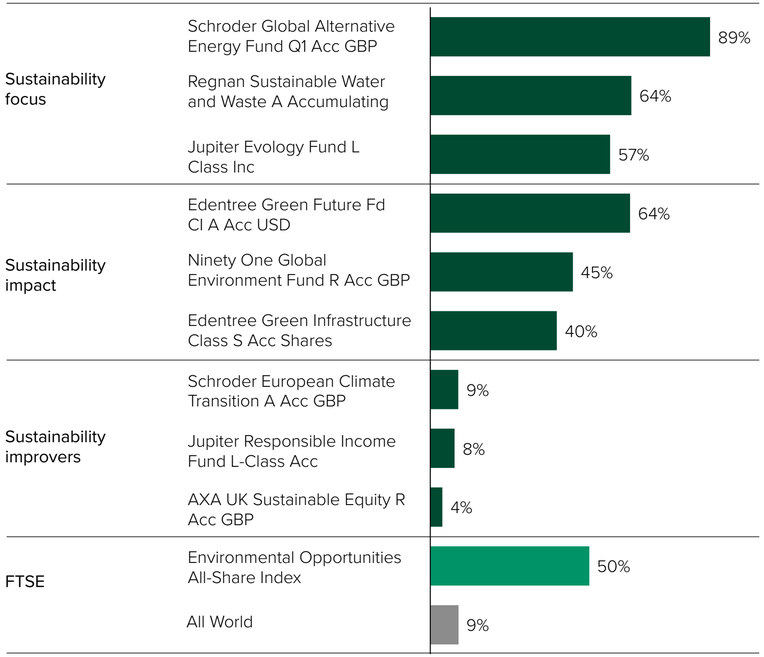
The analysis on the sample SDR-labelled funds shows that (Figure 30):

Sustainability focus funds have the highest WAGR values, reaching up to 89% and exceeding the 50% WAGR of the FTSE EOAS index. This indicates that companies in these funds generate a significant portion of their revenues from sustainable activities.

Sustainability impact funds show a broad range of WAGR values, some higher and some lower than the EOAS benchmark. However, all of them have WAGR values substantially higher than the FTSE All World, reflecting their investment in activities with positive sustainability impacts.

Sustainability improver labelled funds have the lowest WAGR values, at or below the 9% WAGR of the FTSE All World index, aligning with their goal to improve sustainability performance over time.

Figure 30. Weighted average green revenue of SDR labelled funds



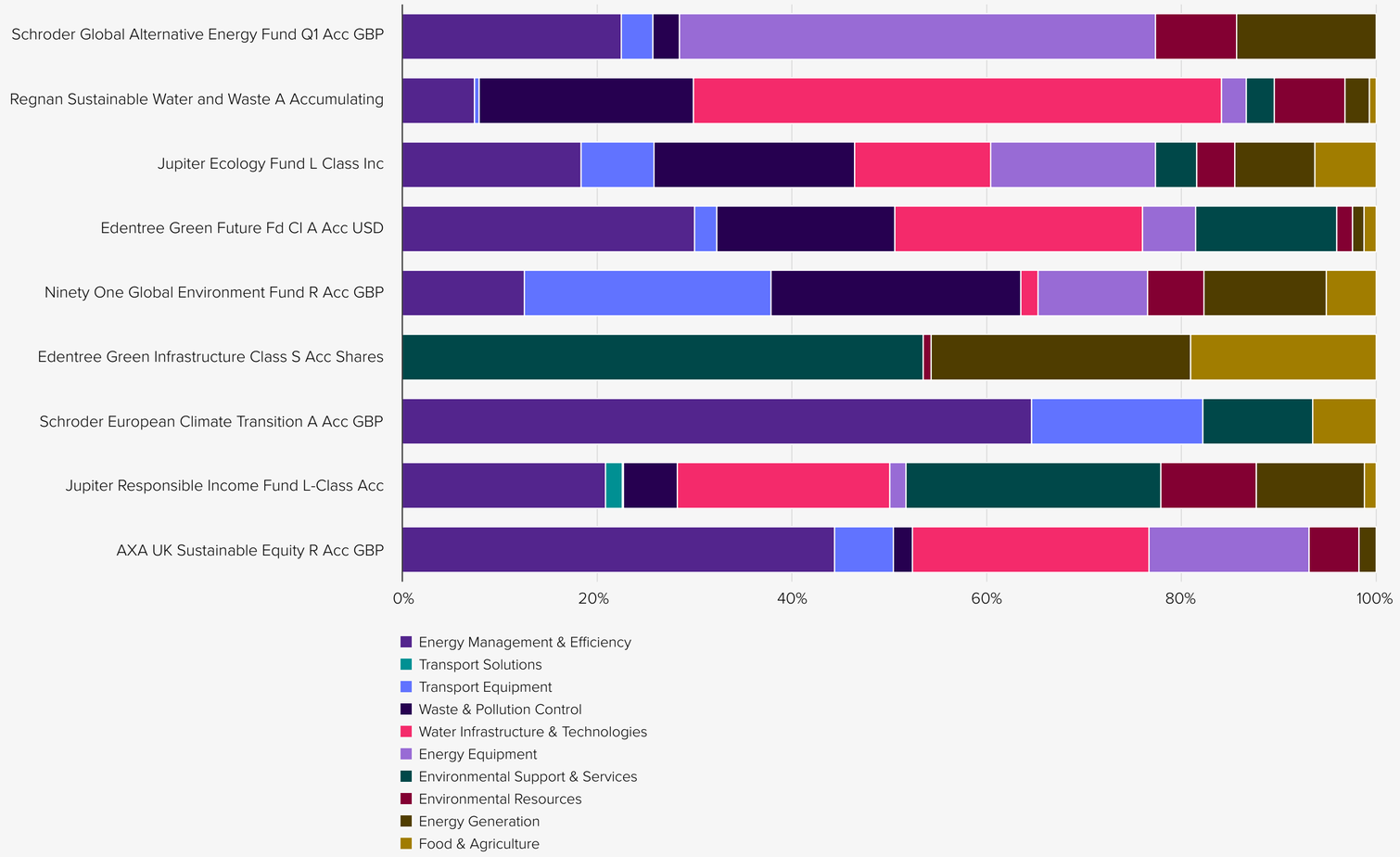
Source: LSEG, Green Revenues data as of April 2025.

[45] *WAGR builds on the portfolio weighting methodology used in carbon metrics like Weighted Average Carbon Intensity (WACI) that is widely adopted by investors. It is a valuable metric for measuring and integrating climate solutions in portfolios. More details: FTSE Russell (2023). Weighted Average Green Revenue (WAGR): Integrating climate solutions into portfolio construction*

Using WAGR, we can also provide insight into the green sectors - that is, the specific climate solutions - to which each fund has exposure. As shown in Figure 31, distributions across green sectors vary widely. For example, the Energy Equipment sector contributes 49% of the Schroder Global Alternative Energy Fund's WAGR, while 54% of the Regnan Sustainable Water and Waste fund's WAGR comes from Water Infrastructure and Technologies, and 22% from Waste and Pollution Control.

The Sustainability Improver funds, on average, have a higher share of the WAGR from the Energy Management and Efficiency sector. Given their focus on improving assets that may not currently be sustainable, it is unsurprising to see a higher share from a green sector centred on efficiency improvements rather than more established green activities such as renewable energy generation. Overall, we found significant variation in the exposure of SDR-labelled funds to the green economy, including specific green sectors, even among funds with the same label. These findings highlight the importance of using metrics such as WAGR to evaluate and deepen our understanding of sustainable investment strategies.

Figure 31. Fund WAGR exposure to green sectors



Source: LSEG, Green Revenues data as of April 2025.

Importance of green economy across climate investment

Whilst some investors try to invest in the green economy directly through indices such as the FTSE Environmental Opportunities All Share index (which contain only companies with substantial green revenues), green revenues data is also widely used in many other climate investment strategies. 38% of FTSE Russell Sustainable Investment indices use green revenues as a data input, comparable to the use of carbon emissions or ESG scores.

There are a number of reasons for investors to consider the inclusion of green revenues data alongside other sustainable investment datasets. Primarily, this includes gaining exposure to the upside opportunities from the transition, but also to combine exposure to climate solutions and the green economy in a broader, more holistic sustainable investment approach that can reduce volatility and tracking error from the parent benchmark. In index solutions, examples include:

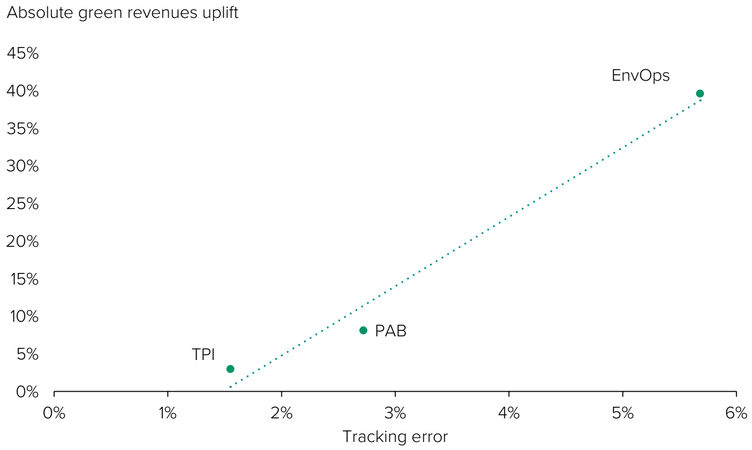
- **FTSE TPI Climate Transition Index Series** This series is designed to reflect the performance of global and diversified indices, where constituent weights vary to account for risks and opportunities associated with the transition to a low carbon economy. They have five key climate data inputs, including fossil fuel reserves, scope 1 and 2 carbon emissions, TPI management quality and TPI carbon performance alongside green revenues.
- **EU Climate Benchmarks Index Series** These are designed to reflect the performance of global and diversified indices whilst delivering the standards of the EU Low Carbon Benchmark Requirements and supporting investors' decarbonisation and net zero strategies. These also combine multiple climate data inputs, including fossil fuel reserves, scope 1, 2 and 3 carbon emissions, TPI management quality, TPI carbon performance, and product- and conduct-related data alongside green revenues.

Figure 32. 12-month rolling relative performance of selected global climate focused indices

Source: FTSE Russell data to 15th April 2025

These indices typically show much less variation of returns vs the market than the pure green economy indices. However, as their focus is broader, they typically also have a lower absolute uplift in exposure to the green economy and benefit less from its strong performance characteristics. There is a trade-off between the tracking error and the green revenues uplift, and the broader indices typically have better improvements in other Sustainable Investment metrics, such as carbon intensity.

Figure 33. Green revenues uplift vs tracking error of selected global climate focused indices



Source: FTSE Russell data as of 31st March 2025

There is a tradeoff between the tracking error and the green revenues uplift, and the broader indices typically have better improvements in other Sustainable Investment metrics...

Figure 34. 1-year risk/return

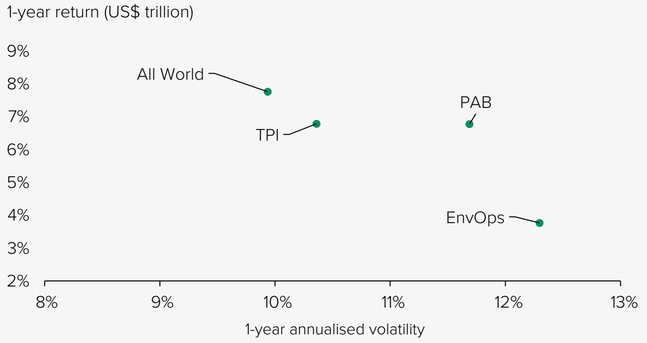


Figure 35. 5-year risk/return

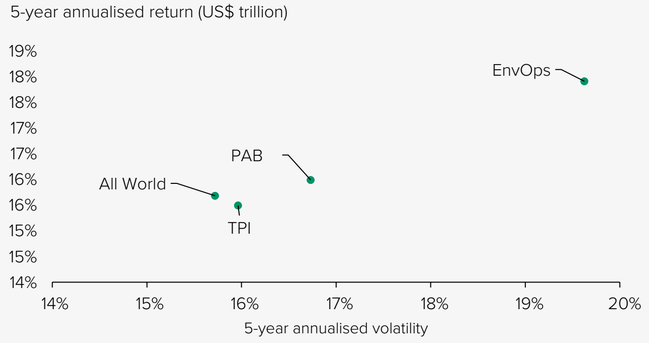


Table 2. 1-year correlation

	EnvOps	PAB	TPI	All World
EnvOps	100%			
PAB	96%	100%		
TPI	93%	97%	100%	
All World	91%	94%	99%	100%

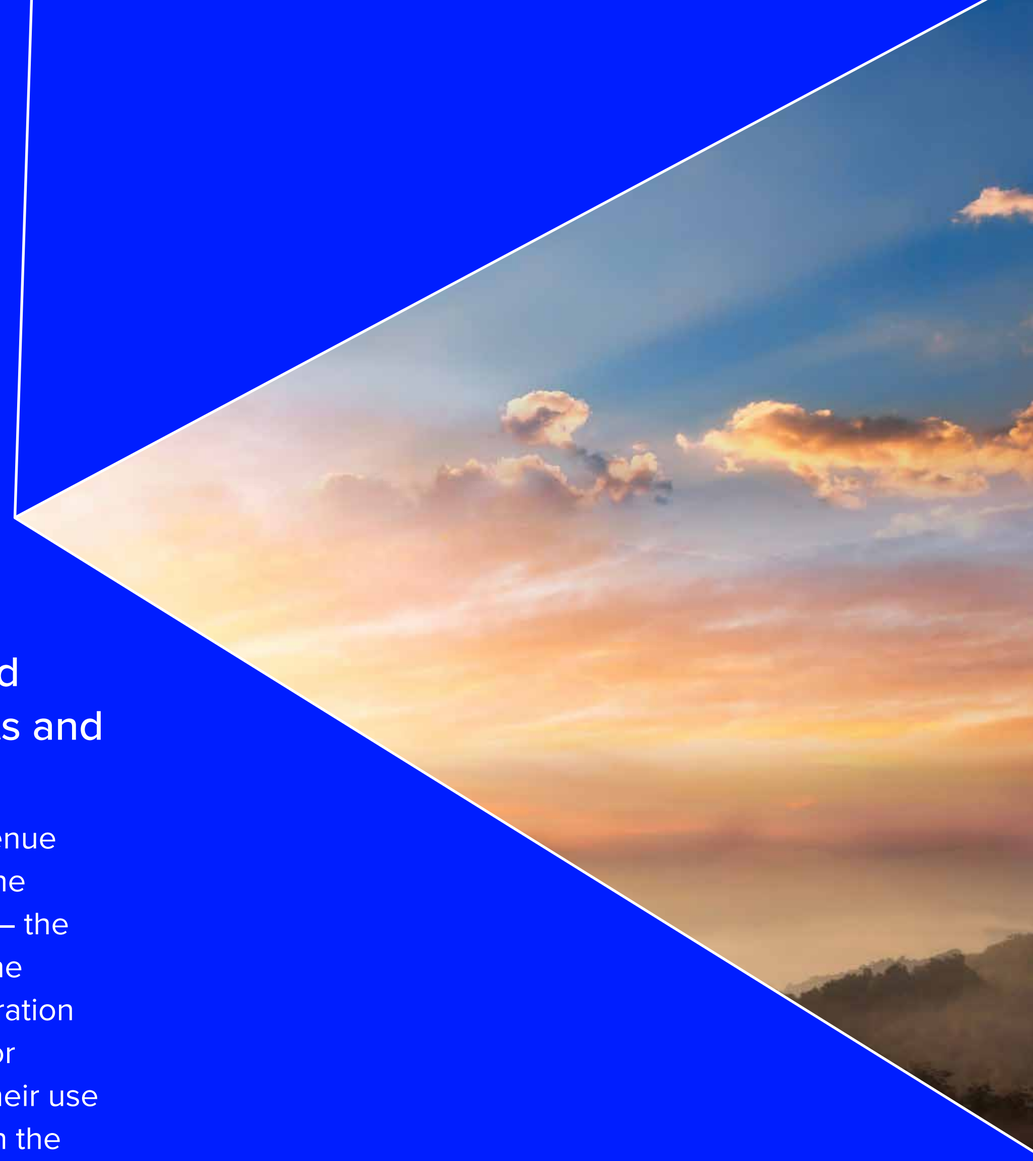
Table 3. 5-year correlation

	EnvOps	PAB	TPI	All World
EnvOps	100%			
PAB	97%	100%		
TPI	95%	99%	100%	
All World	95%	99%	100%	100%

Source: FTSE Russell data as of 31st March 2025

5

Composition of the green economy



The green economy is diverse and multifaceted, spanning 50 markets and various industries.

Examination of market capitalisation and revenue reveals the size and fundamental growth of the green economy, where the ‘green exposure’ – the share of green market capitalisation versus the total market capitalisation – shows the penetration of green business activities in each industry or market. A review of green bonds, including their use of proceeds and issuer groups, sheds light on the financing of underlying products and services in the green economy.

Green economy across industries

Using the traditional industry classification ICB, we found that green economy spans almost all industries. However, there is a concentration in four industries that comprise nearly three-quarters (73%) of the green economy's market capitalisation:

- Technology
- Industrial Goods and Services
- Automobiles and Parts
- Utilities

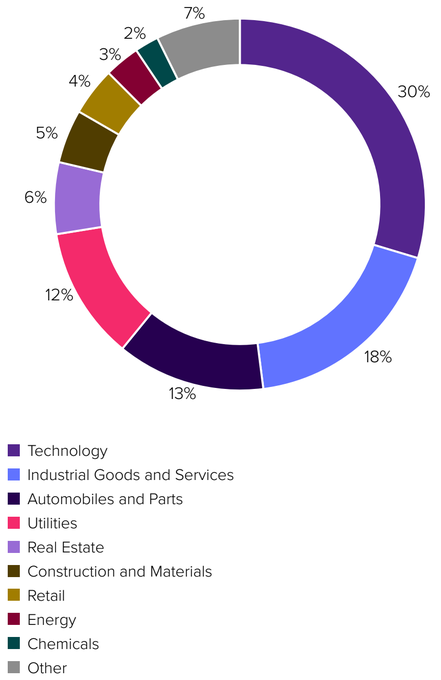
Technology and Automobiles have been major drivers of both growth and volatility of the green economy through exposure to energy efficiency solutions (such as cloud computing and efficient power electronics) and EVs. In contrast, sectors like Utilities and Industrial Goods and Services – with exposure to green sectors such as renewable energy and transport equipment and services – have remained large and stable over time (Box 3).

A large market share in the green economy does not necessarily reflect a high level of green exposure or penetration of green products and services within an industry. For example, the prominent role of Technology and Industrials in the green economy are largely a function of their overall market size rather than green exposures. Green exposure varies significantly across industries. Nearly one-third of industries has green exposure exceeding 10%, with the highest levels found in Autos, Utilities, Construction and Materials, and Real Estate.

Automobiles and Parts, despite its smaller market capitalisation, holds the highest green exposure among all industries – reaching 53% in Q1 2025, up from just 16% in 2019. This makes a significant shift, indicating that green businesses activities, in particular EV and battery manufacturing, have for the first time overtaken non-green activities within the sector. This growth has been supported by policy measures such as stricter emissions standards, grants or subsidies for EV purchases, and investments in charging infrastructure.

Real Estate and Construction sectors have also experienced notable increase in green exposure. Real Estate grew from 8% in 2020 to 20% in 2025, while Construction rose from 14% to 23% over the same period. This growth is largely driven by the expansion of green building activities, reflecting rising demand for sustainable and energy-efficient properties,[46] especially as electricity demand for buildings increases.[47]

Figure 36. Composition of the green economy by ICB sectors



Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

> Automobiles and Parts, despite its smaller market capitalisation, has the highest green exposure at 53%, up from just 16% in 2019.

[46] JLL (2023) - *The commercial case for making buildings more sustainable*
[47] IEA (2025) - *Global Energy Review 2025*

Figure 37. Green economy across ICB sectors

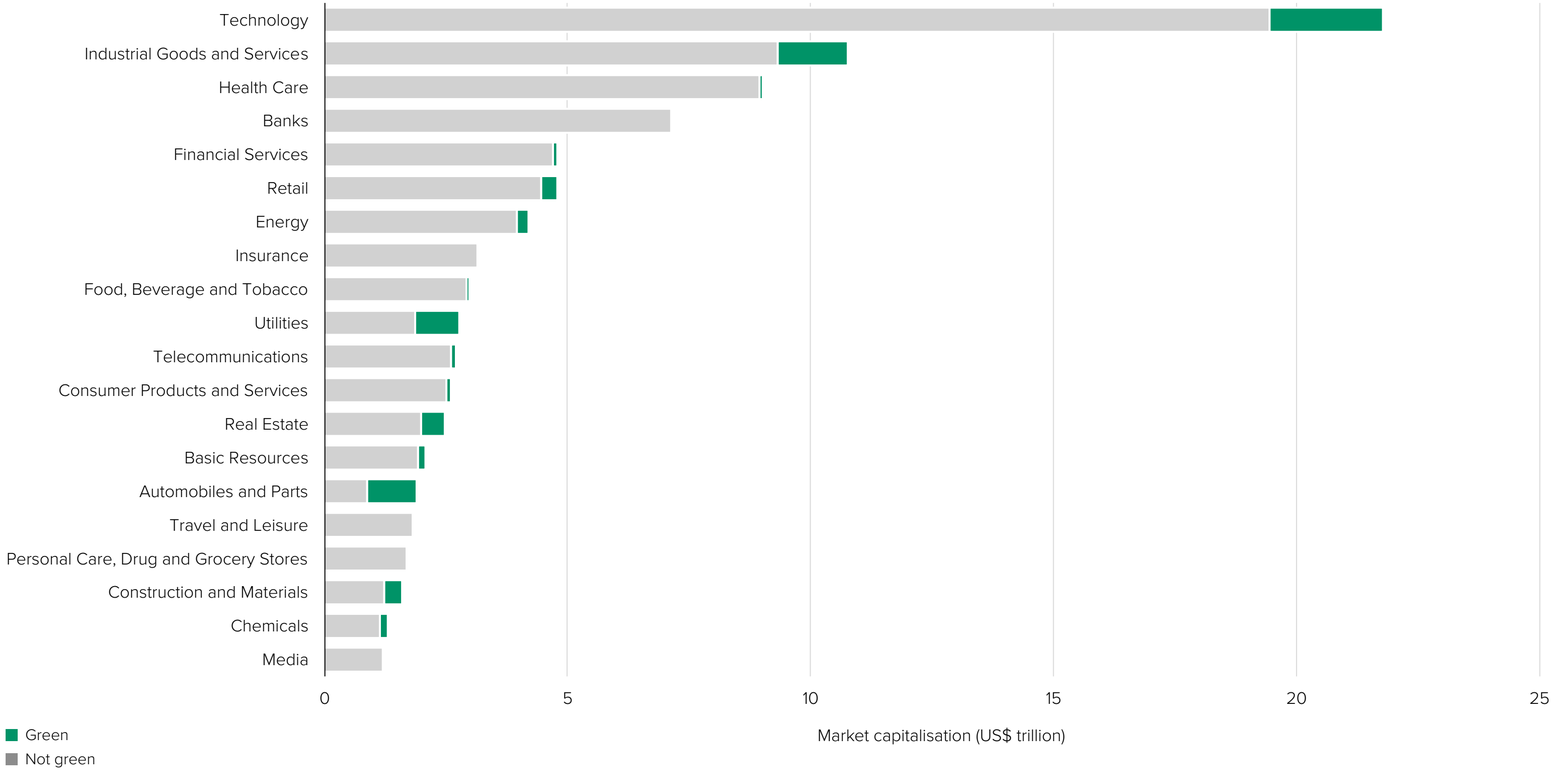
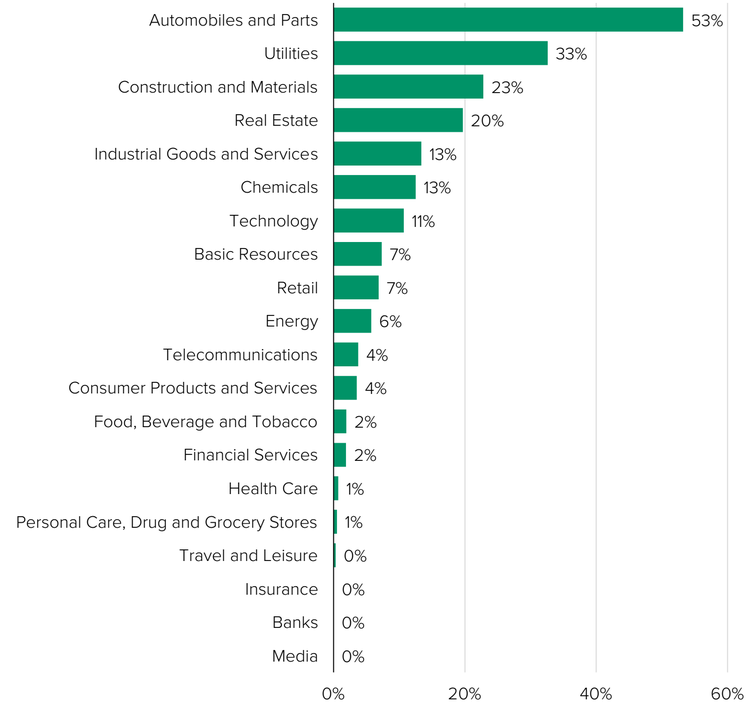


Figure 38. Sectoral green exposure



Note: Based on Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues, with latest Green Revenues data (financial year 2023 or 2024) and the free-float market capitalisation as of April 2025. Green exposure % is calculated by dividing green-revenue-weighted market cap by total market cap of companies.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025.

Box 3

Trends in Technology, Industrial Goods and Services, Autos, and Utilities sectors

Figure 39. Technology share of green market capitalisation, 2016–2025

Technology has been the largest sector since 2021, generating green revenues from activities such as cloud computing, and efficient semiconductors. The sector makes up 30% of the green economy, having grown strongly in 2023 and 2024 to a market capitalisation of US$2.3 trillion in Q1 2025. It is materially larger than the second sector, Industrial Goods and Services.

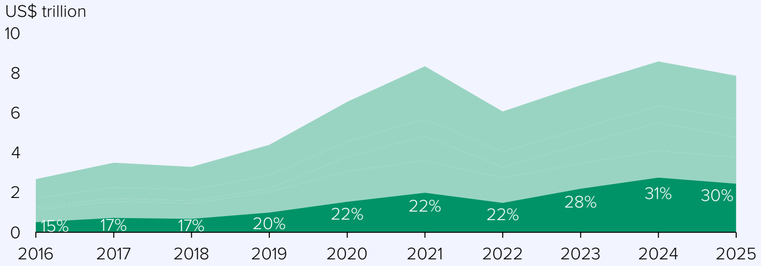


Figure 40. Industrial Goods and Services share of green market capitalisation, 2016–2025

Industrial Goods and Services, covering activities such as smart grids, railways, and industrial energy efficiency, was the green economy's largest sector until Technology took the lead in 2021. With a market capitalisation of US$1.4 trillion, the sector accounts for 17% of the green economy in 2025.

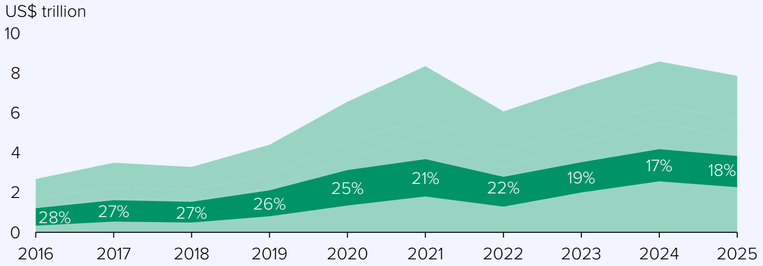


Figure 41. Automobiles share of green market capitalisation, 2016–2025 (Tesla component shown separately)

Automobiles and Parts is a sector largely driven by electric vehicles and battery manufacturing. It currently makes up 13% of the green economy with a market capitalisation slightly over US$1 trillion. Tesla has been responsible for much of the sector's rapid growth and volatility between 2019 and 2021.

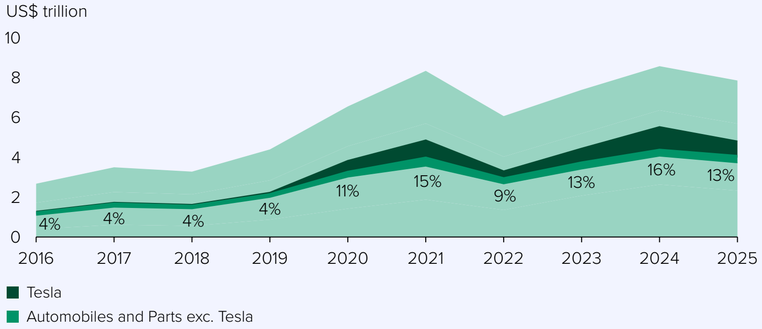
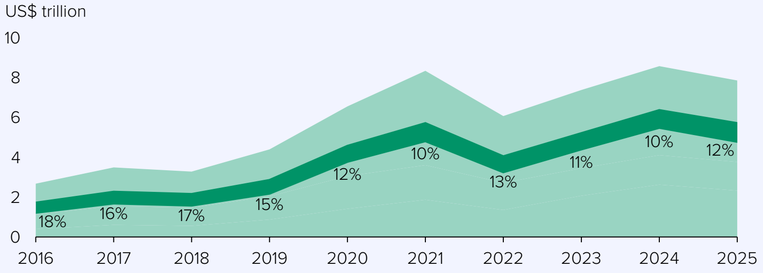


Figure 42. Utilities share of green market capitalisation, 2016–2025

Utilities is the fourth largest sector in 2025, with green revenues mainly from renewable electricity generation. The Utilities sector has shown modest, relatively consistent growth over the last 10 years. In 2025, the green market capitalisation of this sector has grown to over US$900 billion, with its share in the green economy rising to 12%.



Note: Based on Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues, with latest Green Revenues data (financial year 2023 or 2024) and the free float market capitalisation as of April 2025. Green exposure % is calculated by dividing green-revenue-weighted market capitalisation by total market capitalisation of companies.

Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025.

Box 4

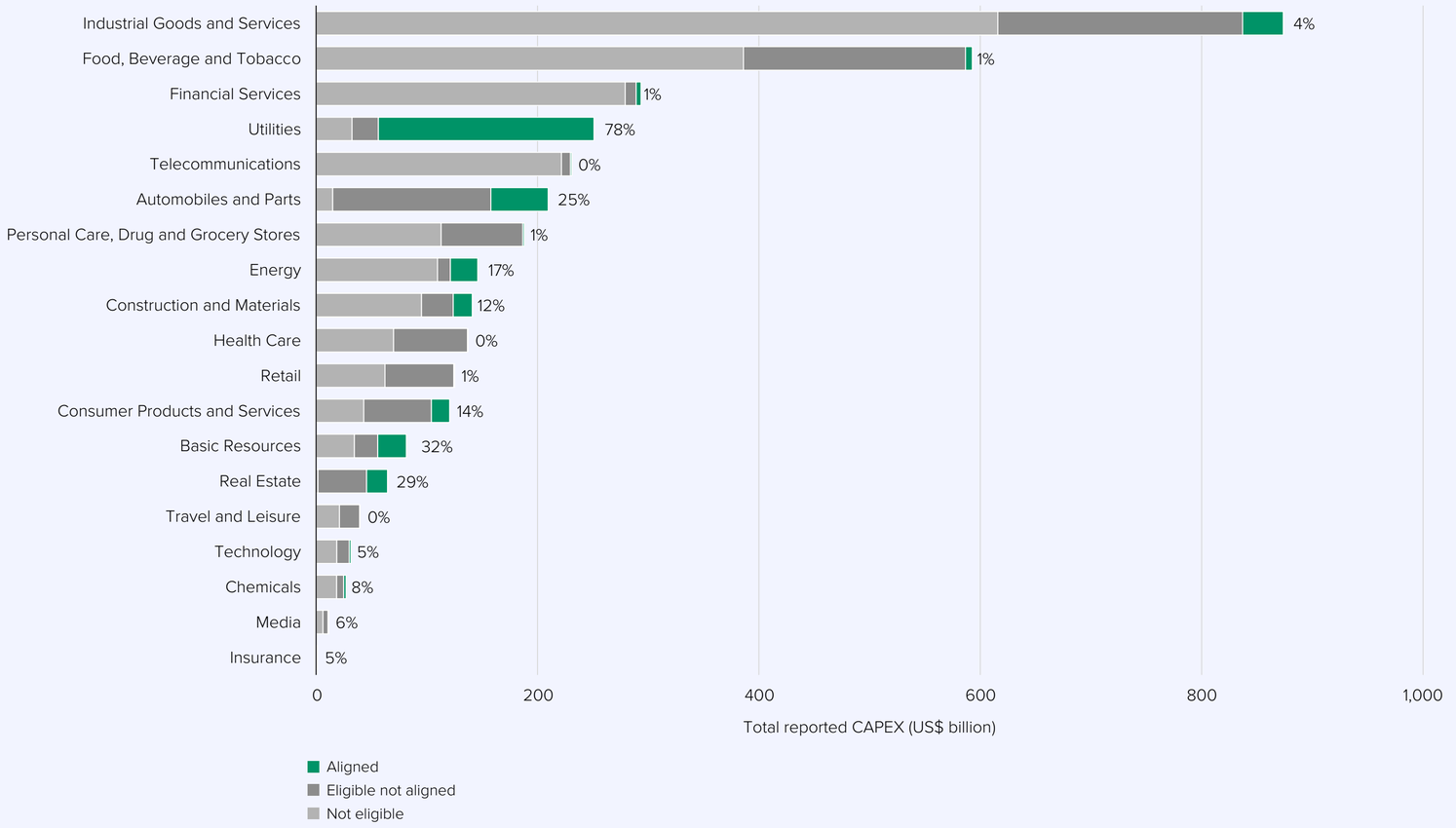
Disclosure on Green Capital Expenditure (CAPEX) against the EU taxonomy

Green CAPEX is valuable to illustrate a forward-looking view of the green economy, hinting at potential diversions from historic trends. However, insufficient disclosures of this metric limit insights into the present and future state of the green economy.

While regulations have driven an increase in green CAPEX disclosures, reporting remains limited. For the 2023 financial year, just over half of the c.2,000 companies partially or fully reported as required under the EU Corporate Sustainability Reporting Directive (CSRD)[48]. These disclosures, as well as some voluntary reporting from other companies, give us a view of 1,240 listed companies which report their share of capex that classified as green under the EU taxonomy in 2023.

In 2023, US$475 billion of investment fed into the green economy. The Utilities industry made up the lion's share of this expenditure, with US$195 billion investment in taxonomy-aligned activities, such as renewable energy generation.

Figure 43. Reported EU Taxonomy CAPEX for 2023 by ICB Industry



Source: LSEG EU taxonomy as-reported data as of December 2024.

[48] *LSEG (2025) - Reality check: 8 years after the first EU Taxonomy conversation*

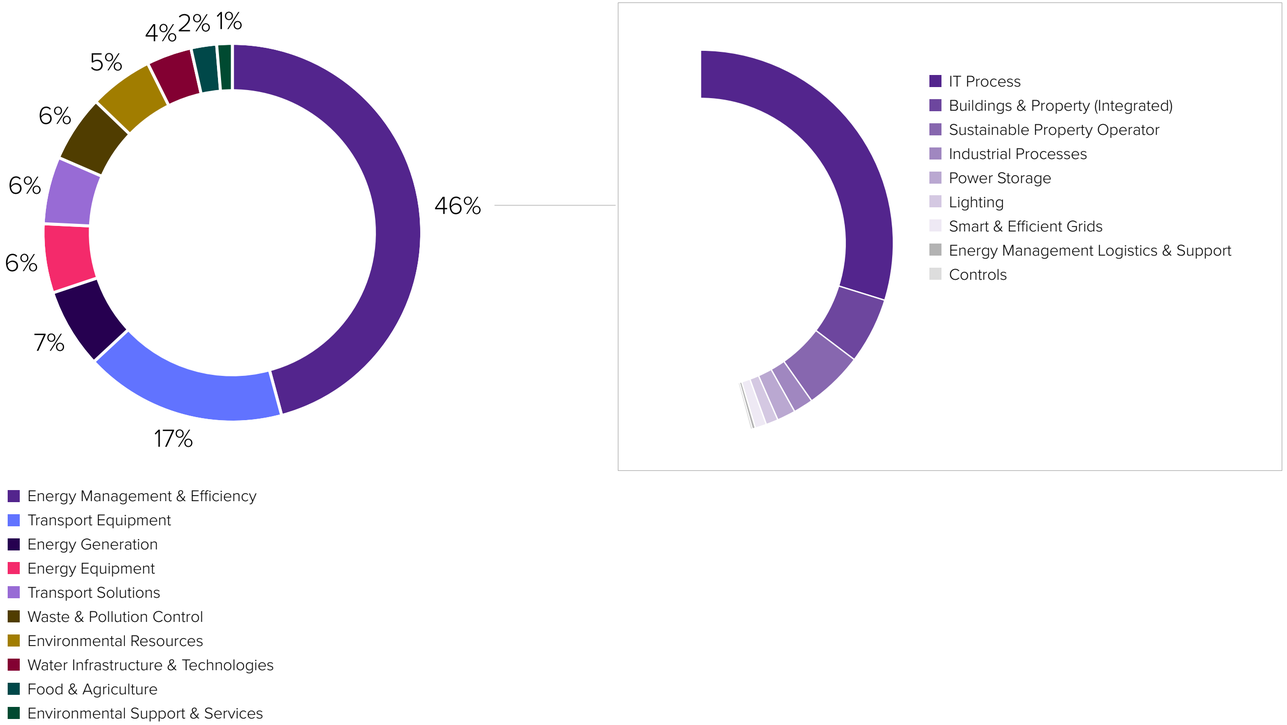
Green products and services across value chains

The green economy includes a wide array of products and services with environmental benefits across values chains. LSEG's Green Revenues Classification System (GRCS) categorises 133 types of green products and services in 10 sectors.

Energy Management and Efficiency, which covers green buildings, cloud computing and efficient power electronics, accounts for almost half of the green economy by market capitalisation. Having grown at a five-year CAGR of 10%, it reached a market capitalisation of over US$3.6 trillion in Q1 2025.

There is a growing demand for energy efficiency solutions with accelerated global energy needs heightened by physical climate change risks and rapid artificial intelligence (AI) development. Buildings accounted for 60% of the growth in electricity consumption in 2024, largely due to increased air conditioning needs during heatwaves.[49] AI technologies are significantly increasing electricity demand from data centres, with consumptions growing by around 12% per year since 2017.[50] Investing in energy-efficiency technologies, including AI-driven solutions[51], can help address this rising demand.

Figure 44. Composition of the green economy by green sector



Note: Based on Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company Green Revenues, with latest Green Revenues data (financial year 2023 or 2024) and the free-float market capitalisation as of April 2025.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

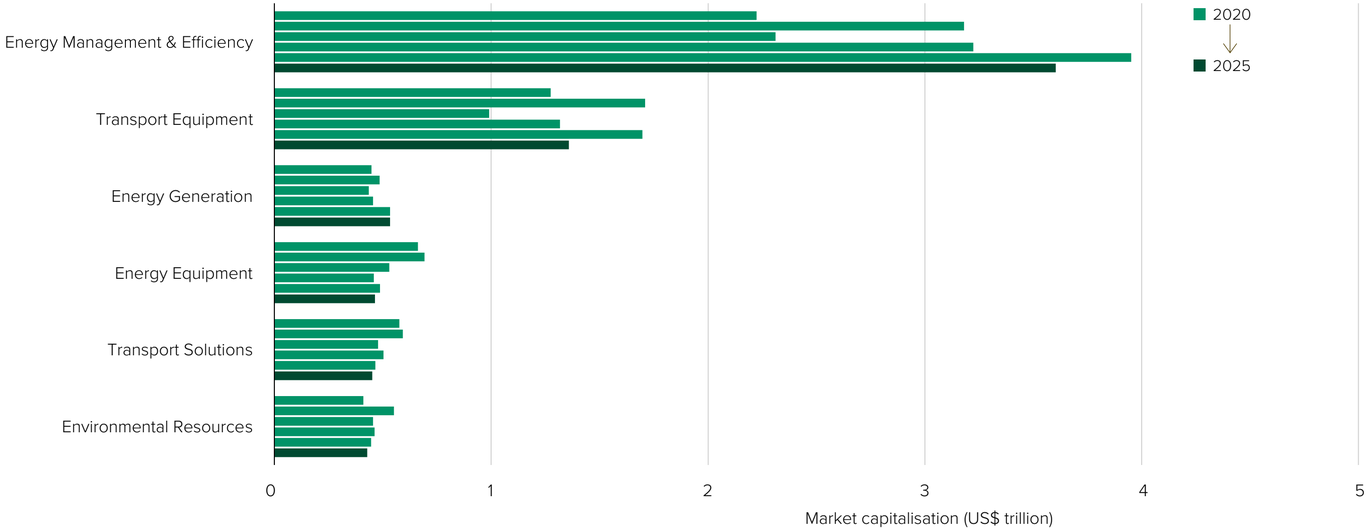
[49] *IEA (2025) - Global Energy Review 2025*
[50] *IEA (2024) - World Energy Outlook 2024*
[51] *DeepSeek shows that AI algorithms can improve energy efficiency in addition to enhancement in hardware electronics. National University of Singapore (2025). DeepSeek's AI Disruption: Implications for Global Climate Policy on Digital Decarbonisation, Energy Transitions and International Law*

Transport Equipment, which covers EVs, battery manufacturing, and railway manufacturing, is the second largest sector of the green economy (17%). It has been the fastest growing sector over the long term with a 20% of CAGR since 2016. However, growth has slowed down significantly in recent years with a five-year CAGR of just 1.3%, largely driven by the decline of Tesla in Q1 2025.

There are other significant green sectors, each sitting at similar shares of the green economy between 5% and 7%.

- Renewable energy is a large component of the green economy, with **Energy Generation** sitting at 7% of the green economy, followed closely by **Energy Equipment** at 6%.
- **Transport Solutions**, covering activities such as railway operations, falls after Energy Equipment, also at 6%. This is a significant decline for the sector since 2020 driven by the video conferencing activities.
- **Waste and Pollution Control**, and **Environmental Resources** (such as recyclable products and materials) take up similar percentages, between 5% and 6%, followed by **Water Infrastructure and Technologies** at 4%.
- **Food & Agriculture**, and **Environmental Support Services** (such as environmental consulting and carbon credit trading) remain small sectors.

Figure 45: Growth of selected green sectors 2020–2025



Note: Based on Green Revenue-weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues. 2023 and 2024 data are based on latest Green Revenues data (financial year 2023 or 2024).
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025.

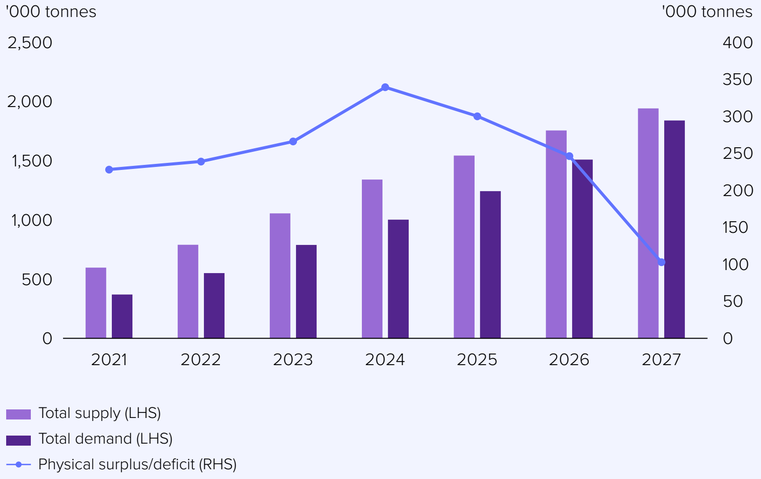
Box 5

Environmental resources: Lithium

In 2024, lithium carbonate demand increased with electric vehicles (EVs) and battery storage accounting for 85% of total consumption. Supply also rose, by 27% year-on-year to 1.3 million tonnes, driven by higher output from major producers.

Despite robust demand growth, a physical surplus of 0.3 million tonnes emerged by year-end, keeping prices subdued. The market is expected to remain under pressure until this surplus narrows.

Figure 46. Lithium carbonate supply & demand



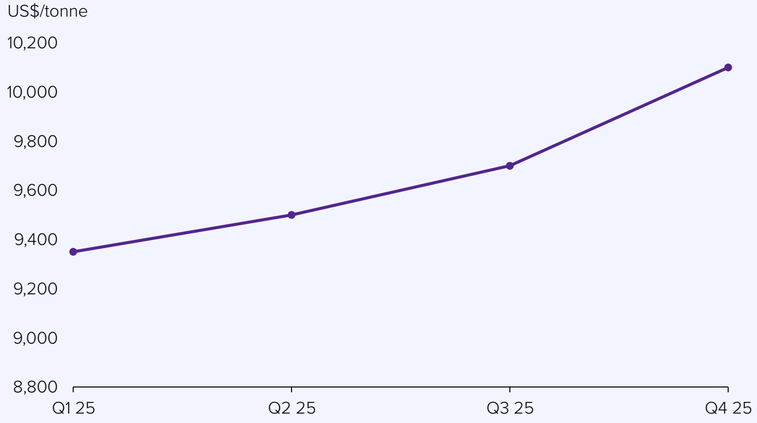
Source: LSEG Metals Research

Looking ahead, supply is forecast to grow at a CAGR of 18%, while demand is expected to rise faster at 26% CAGR over the next three years. By the end of 2027, the surplus is projected to shrink by 70%, falling to just 0.1 million tonnes.

Lithium carbonate demand from the automotive and battery storage sectors will remain strong, growing at 25% and 37% CAGR, respectively. In absolute terms, EVs are expected to generate demand of 1.1 million tonnes, while battery storage will contribute 0.4 million tonnes.

Lithium prices are expected to remain soft through 2025, averaging around $10,500/tonne for lithium carbonate, with lithium hydroxide following a similar path. A meaningful price recovery is unlikely before 2026, when the surplus is expected to fall below 0.2 million tonnes.

Figure 47. Lithium hydroxide quarterly average price forecast

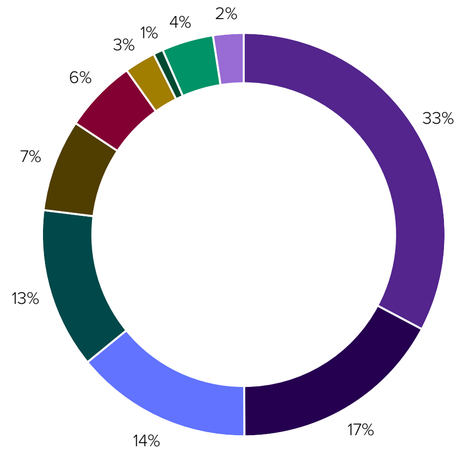


Source: Forecast based on LME Lithium Hydroxide CIF (Fast Mkt MB)

Green bonds use-of-proceeds

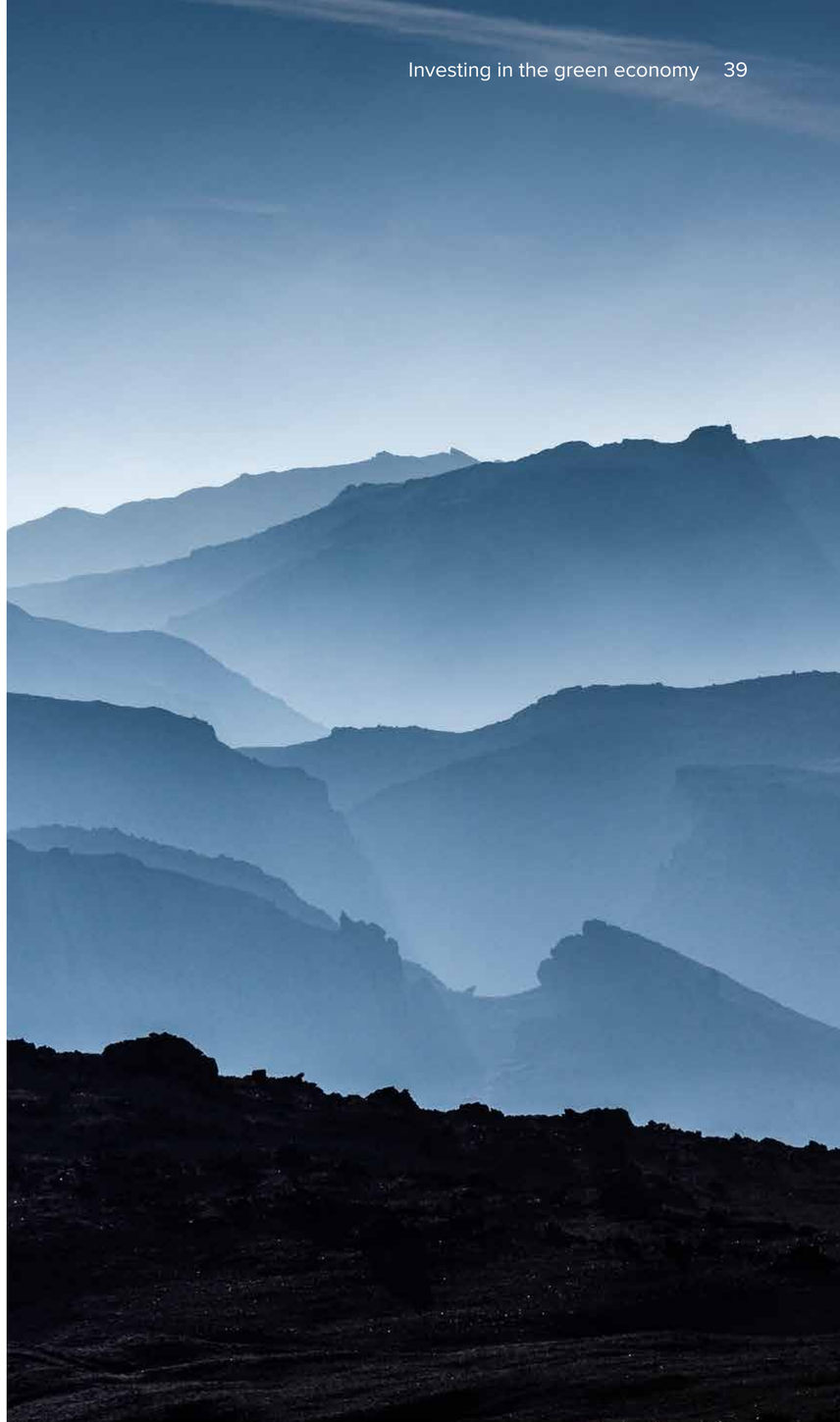
Classified by the green economy sectors[52], Energy Management and Efficiency accounts for 33% of the total green bond outstanding amount as of Q1 2025. This is consistent with its leading role as the largest green economy sector in the listed equities markets. Green bond proceeds raised in this sector typically flows towards investment into commercial, residential and public building efficiency improvements, alongside equipment updates in industrial sectors. Energy Generation and Energy Equipment together form the second largest green bond use-of-proceeds category (17%), followed by Transport Solutions and Transport Equipment (14%).

Figure 48. Green bonds by use-of-proceeds



Source: LSEG

[52] *Note on methodology: the green bond use-of-proceeds data is based on the LSEG Data & Analytics green bond database, and a high-level mapping between green bond use-of-proceeds categories and green economy sectors has been conducted to produce the green bonds proceeds allocation. Where an issuer's disclosure on the detailed proceeds allocation amount or percentage is not available, an equal weighting of each use-of-proceeds category has been applied, and the allocation calculation has been conducted using the principal amount of each bond.*



Box 6

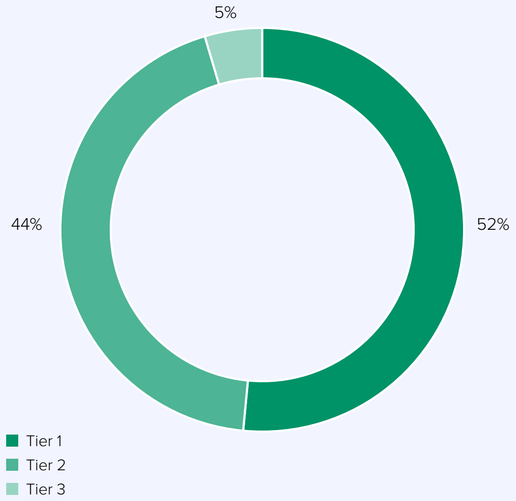
Green tiering: how green is the green economy?

Each product and service in the green economy has its own environmental impact. While some green solutions offer clear benefits, others present more complex trade-offs. For example, biomass from crops generally emits less carbon than fossil fuels, but can lead to issues like land use conflicts and biodiversity loss. To navigate these nuances, the LSEG Green Revenues Classification System (GRCS) categorises green activities into three tiers:

- **Tier 1.** Champions of sustainability delivering clear and significant environmental advantages.
  Examples include renewable energy generation and electric vehicles
- **Tier 2**. Activities that provide moderate, yet positive, environmental benefits.
  Examples include large hydropower and cloud computing
- **Tier 3**. While offering some green benefits, these activities may have a neutral or even negative overall impact.
  Examples include lithium mining and biomass from energy crops

The bulk of the green economy – 95% by market capitalisation – is made up of Tier 1 and Tier 2 activities.

Figure 49. Green economy by green tiers



Note: Based on Green Revenue-weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues, with latest Green Revenues data (financial year 2023 or 2024) and the free float market capitalisation as of April 2025. Due to rounding, values may not total exactly 100%.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

> The bulk of the green economy – 95% by market cap – is made up of Tier 1 and Tier 2 activities.

Green economy across markets

The green economy spreads across both developed and emerging economies, though it is more concentrated in developed economies. By market capitalisation, developed markets account for 84% of the green economy, with a five-year CAGR of 4.9%. Emerging markets, on the other hand, represents the remaining 16%, with a five-year CAGR of -1.7% primarily due to the contraction of solar companies following rapid growth in 2020 and 2021. Despite this, emerging markets have a higher green exposure, at 10.7%, which is more than 2 percentage points above that of developed markets, indicating a greater penetration of green products and services.

Emerging markets contribute 25% of global green revenues, despite having a smaller market capitalisation. Although emerging and developed markets both have 7.5% revenue exposure to the green economy, green revenues from emerging markets have grown nearly twice as fast as the developed markets over the past five years, with a CAGR of 14%.

Figure 50. Green market capitalisation by country classification

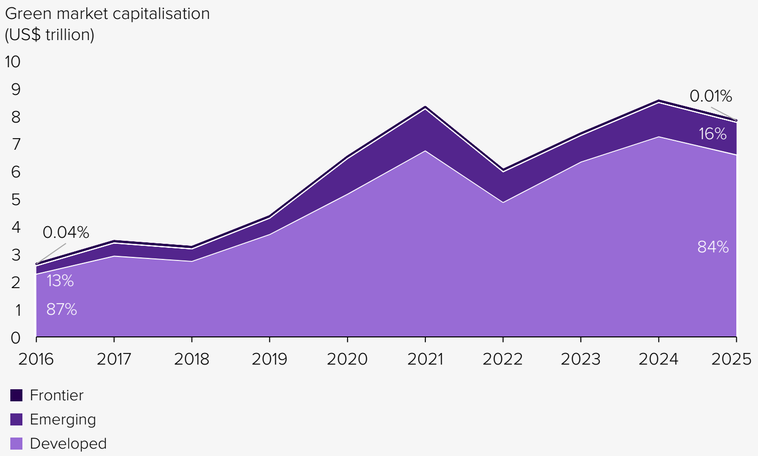


Figure 51. Green revenue by country classification

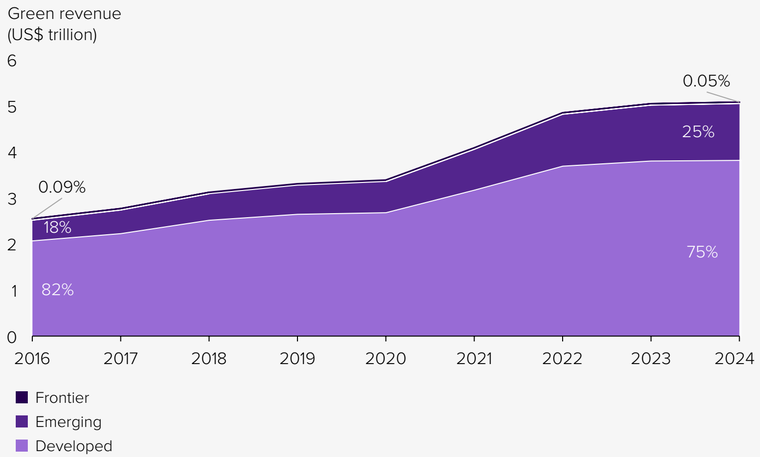


Figure 52. Green market capitalisation exposure by country classification

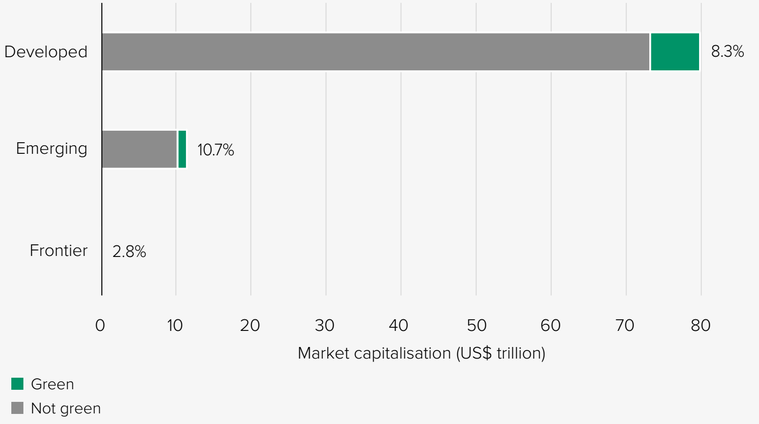
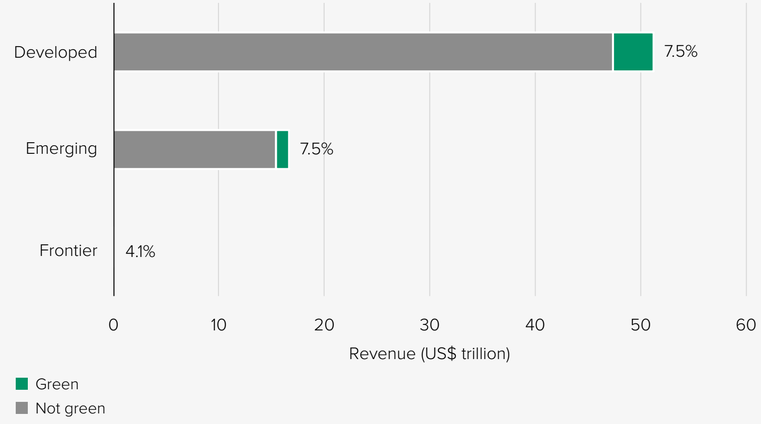


Figure 53. Green revenue exposure by country classification



Note: Based on Green Revenue-weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues, with latest Green Revenues data (financial year 2023 or 2024) and the free-float market capitalisation as of April 2025. Country classification based on LSEG Annual Country Classification 2024.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

The green economy is spread across 50 countries. While the US dominates the global green economy due to the large size of its listed equities market, its green exposure is below the world's average of 9%. On the other hand, a number of countries in Europe and Asia have more than 10% green exposure despite their much smaller market size.

Figure 54. Composition of the green economy by country

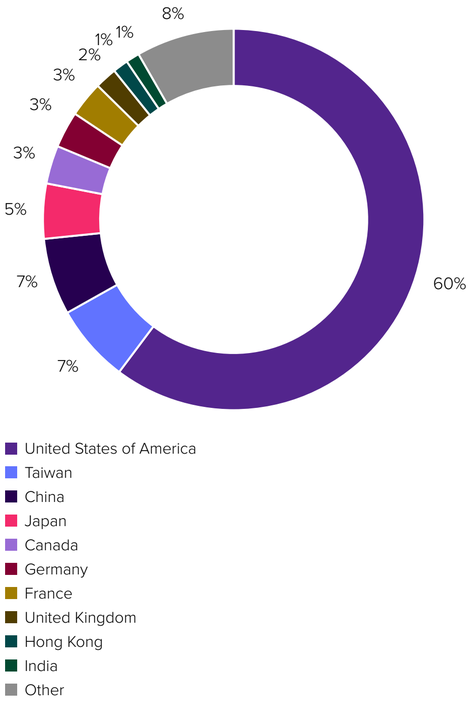


Figure 55. Green economy by market exposure

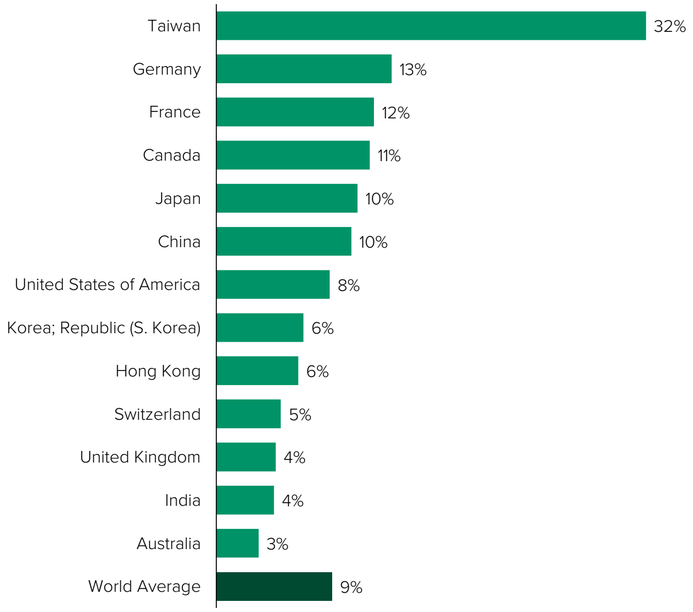
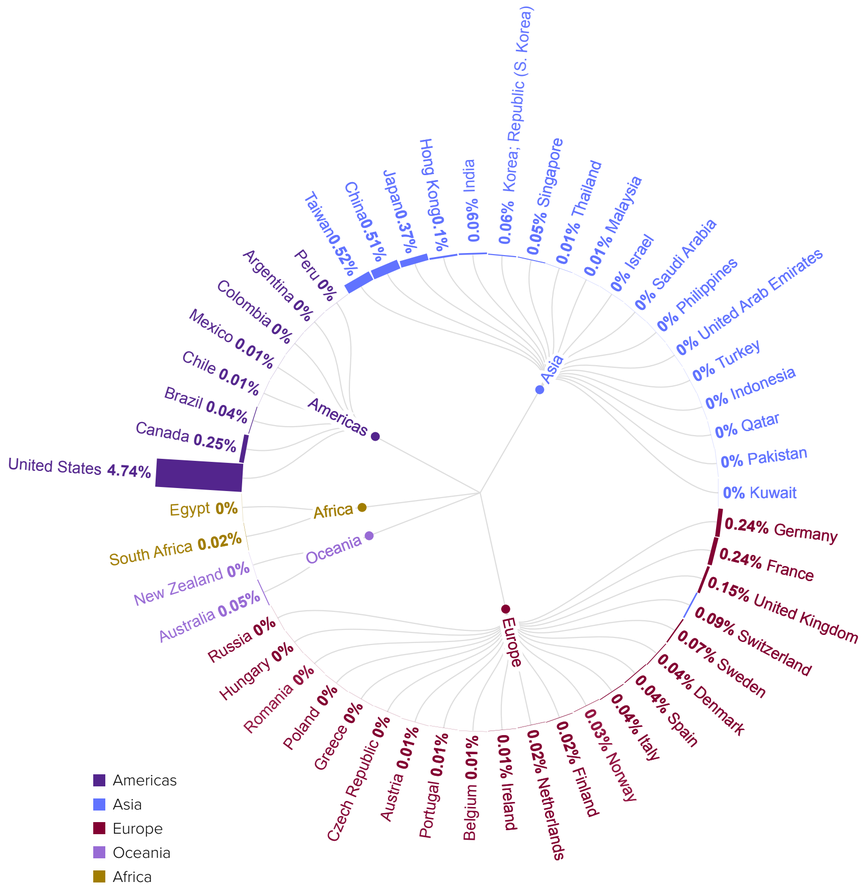
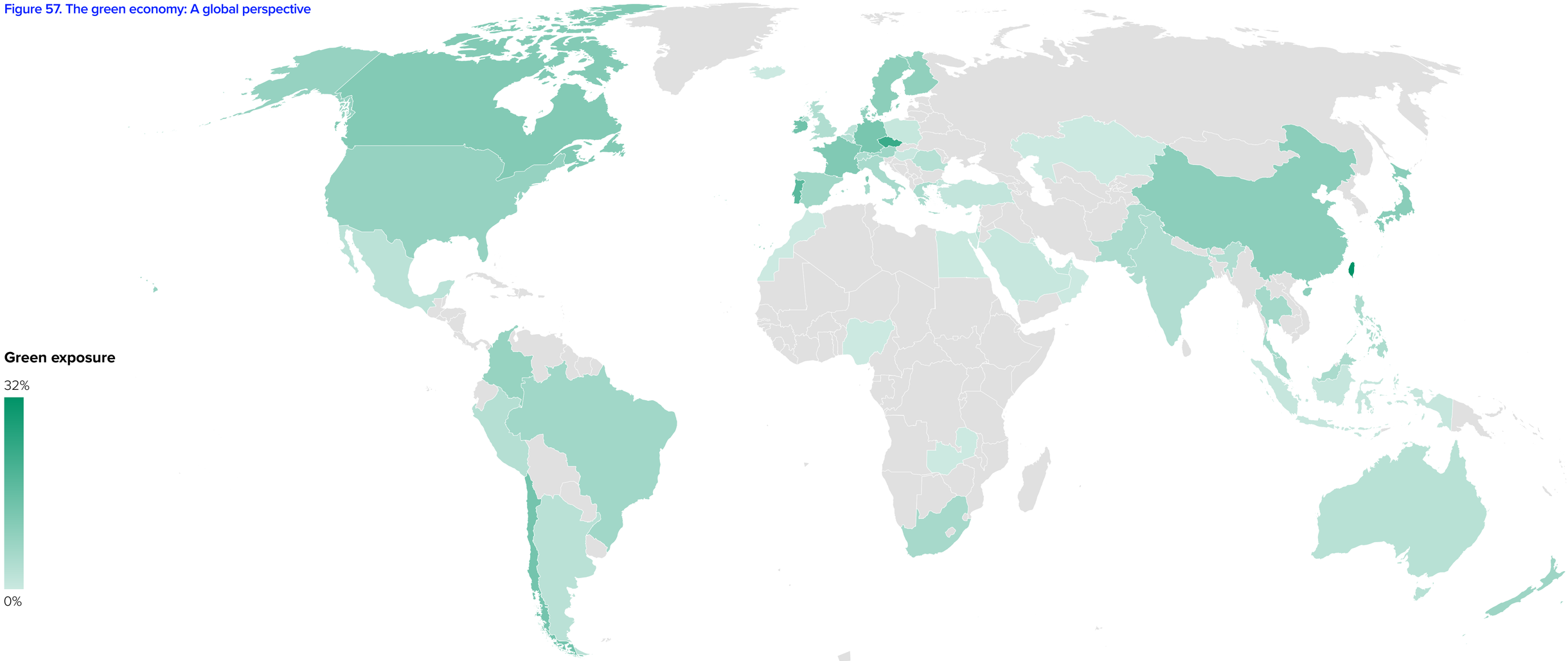


Figure 56. Global distribution of the green economy



Note: Based on Green Revenue-weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues, with latest Green Revenues data (financial year 2024 or 2025) and the free-float market capitalisation as of April 2025. By country of domicile of listed companies.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025.

Figure 57. The green economy: A global perspective



Note: Based on the latest Green Revenues data (financial year 2023 or 2024) and the free-float market capitalisation as of April 2025. By country of domicile of listed companies. Green exposure % is calculated by dividing green-revenue-weighted market capitalisation by total market capitalisation of companies.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

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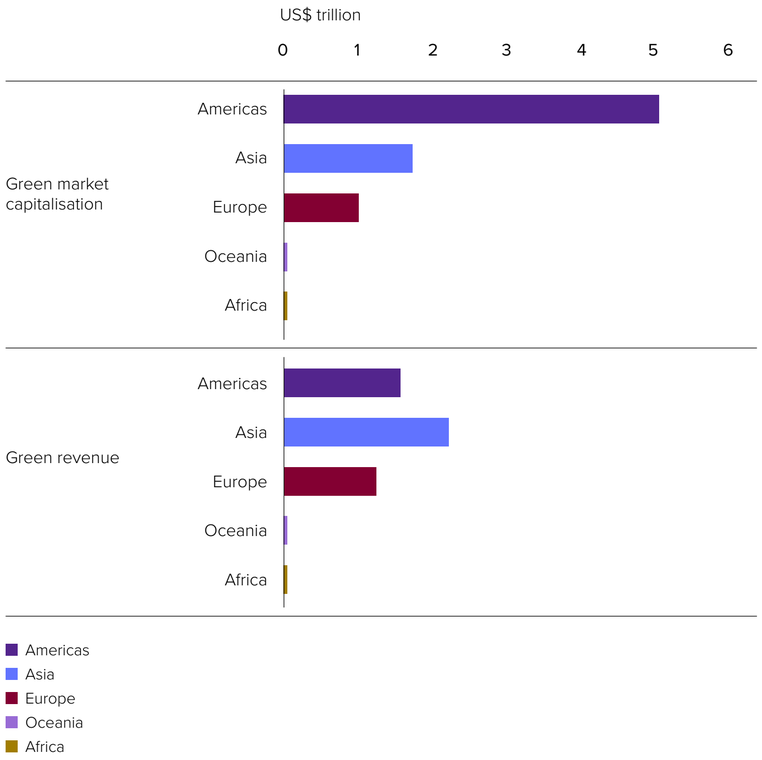
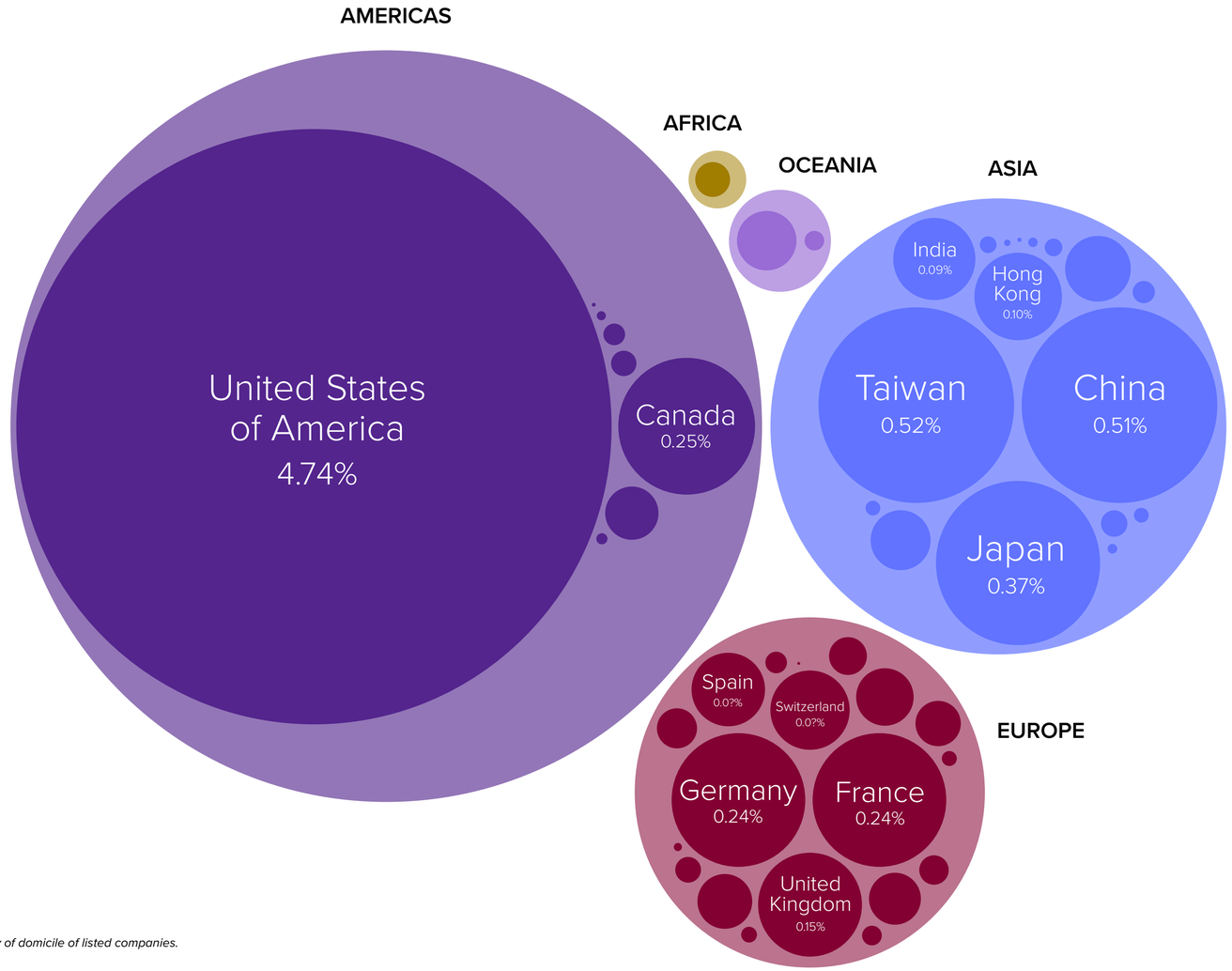
Regional analysis shows that while the Americas lead the global green economy by market capitalisation (64%) due to large US companies, Asia generates the most global green revenues (44%), led by China and Japan. In Asia, auto companies play a critical role in driving the steady growth of green revenues despite fluctuations in market capitalisation. In contrast, Europe has remained more stable, with a share of 13% in the global green economy by market capitalisation.

Figure 58. Green market capitalisation and green revenue by region

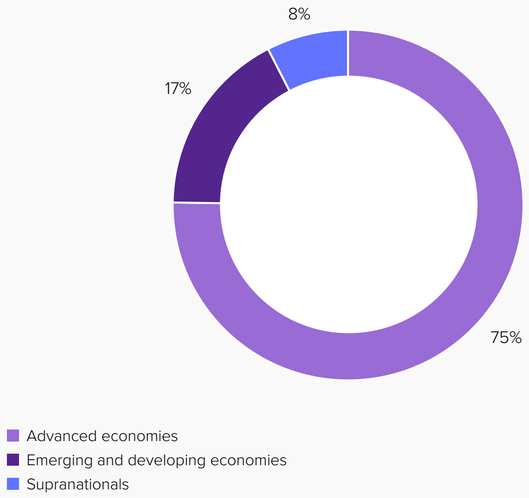




Note: Based on the latest Green Revenues data (financial year 2023 or 2024) and the free-float market capitalisation as of April 2025. By country of domicile of listed companies. Green exposure % is calculated by dividing green-revenue-weighted market capitalisation by total market capitalisation of companies.
Source: LSEG Green Revenues data as of April 2025. LSEG free float market capitalisation data as of April 2025

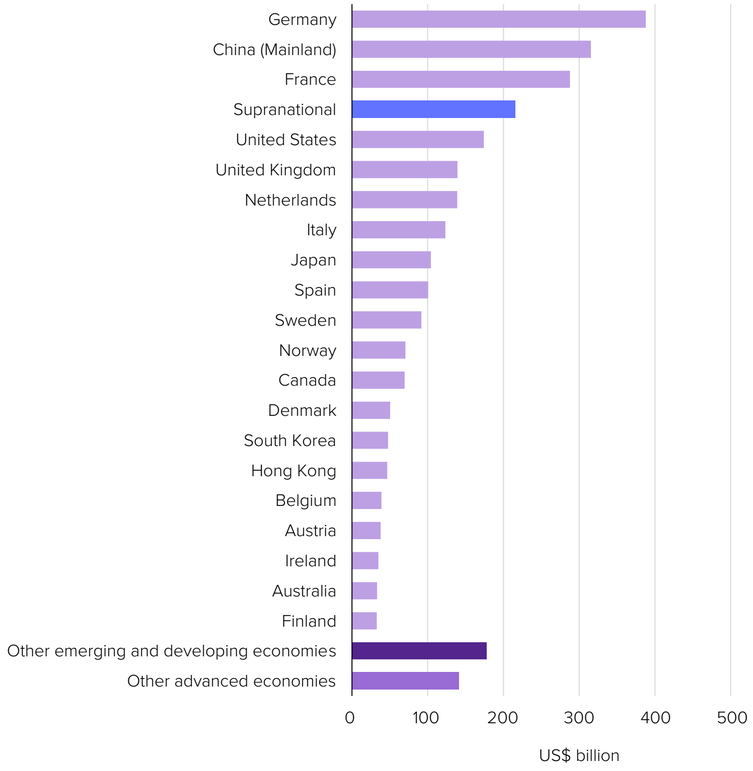
In the green bond market, while issuers span 85 countries and regions, developed markets continued to play a leading role, accounting for 75% of the total outstanding green bonds. Germany remained at the top with over US$388 billion worth of green bonds outstanding, followed by Mainland China and France, with US$315 billion and US$287 billion respectively. Supranationals such as multilateral development banks have been key players. If considered a standalone category, they would rank the fourth largest.

Figure 59. Green bond outstanding amount by regions



Source: LSEG (2025)

Figure 60. Top 20 green bond issuing countries (by outstanding amount)



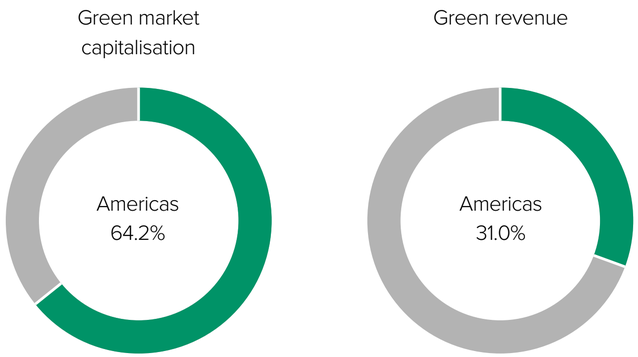
Source: LSEG (2025)

Americas

By market capitalisation, the Americas lead the global green economy with a share of 64%. It is mainly driven by large yet volatile US companies such as Tesla (Box 7). Companies in the US have on average, very high market capitalisations relative to their annual revenues. In terms of global green revenue, the Americas contribute 31%, second to Asia.

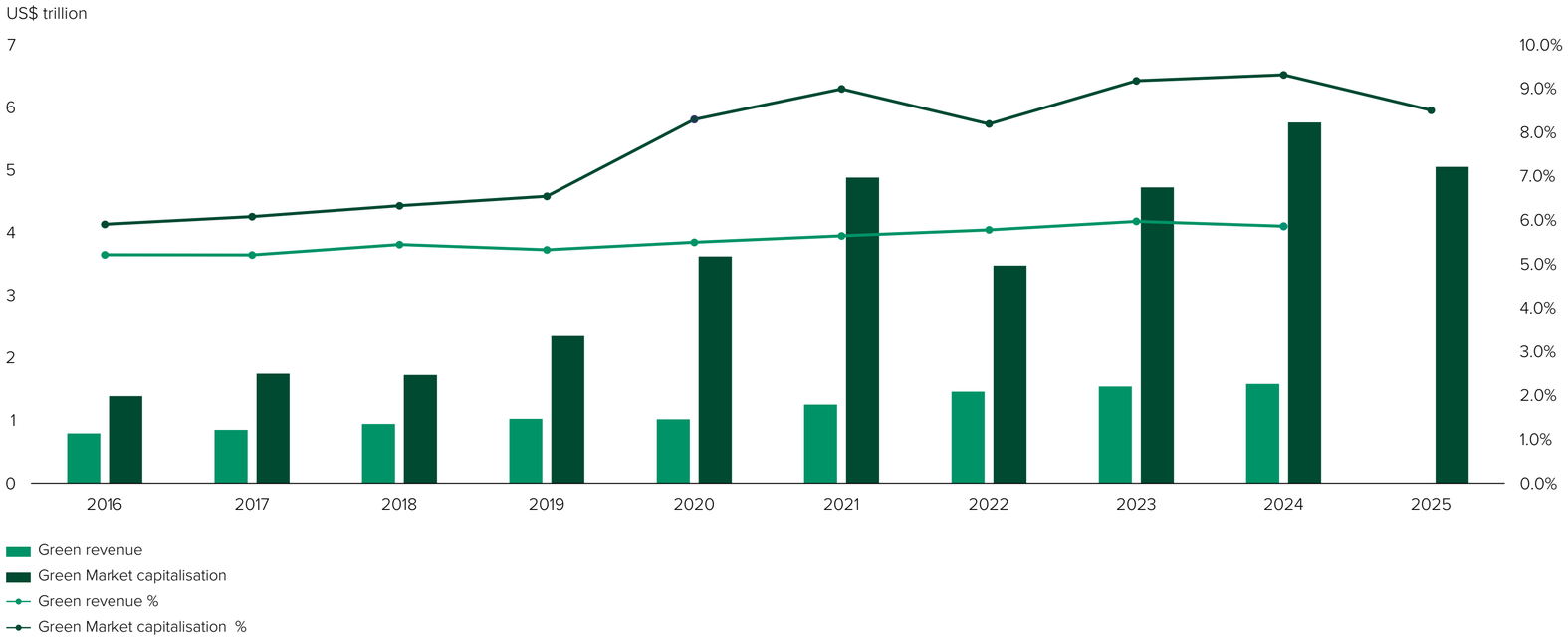
The green exposure of the Americas market, measured by market capitalisation, has closely tracked the global average – peaking at 9.3% in 2024 before dropping to 8.5% in 2025. However, when measured by revenue, the region lags. From 2016 to 2024, green revenue exposure in the Americas increased by just 12%, compared to a global rise of 25%, highlighting a slower integration of green business activities relative to other regions.

Figure 61. Regional share of the green economy from the Americas



Source: LSEG

Figure 62. Americas: Regional green economy 2016–2025



Note: Green Revenue is calculated by aggregating all the green revenues from companies in the universe. Green Revenue % is calculated by dividing Green Revenue by total revenues from companies in the universe. Green Market Cap is the Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues. Green Market Cap% is calculated by dividing Green Market Cap by total market capitalisation of companies in the universe. 2025 Green Market Cap ad Green Market Cap% data is based on the latest Green Revenues data available (financial year 2022 or 2023) and the free float market capitalisation as of 1 April 2025.
Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG revenue data as of December 2024.

Box 7

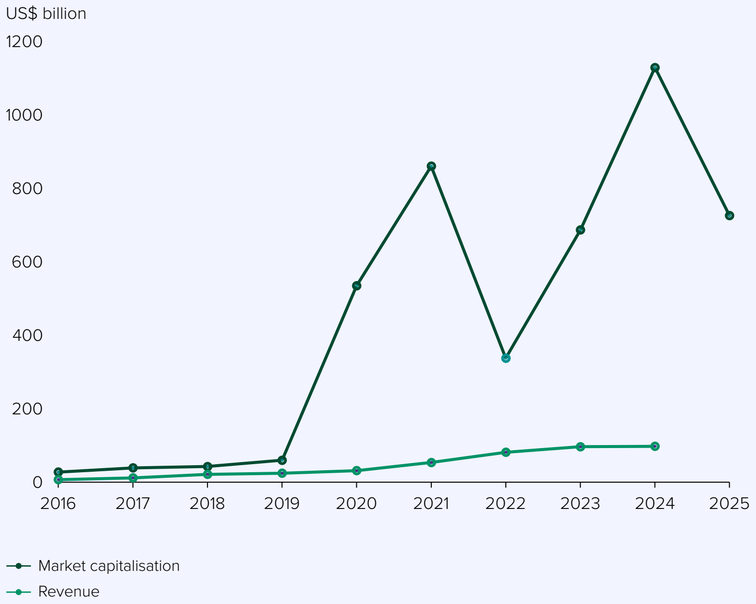
A green giant on the move: Tesla

Considering the green exposure of different industries in the Americas, Automobiles and Parts stands out, with 82% exposure to the green economy by market capitalisation. This is driven by the high market valuations of a pure-play green company: Tesla.

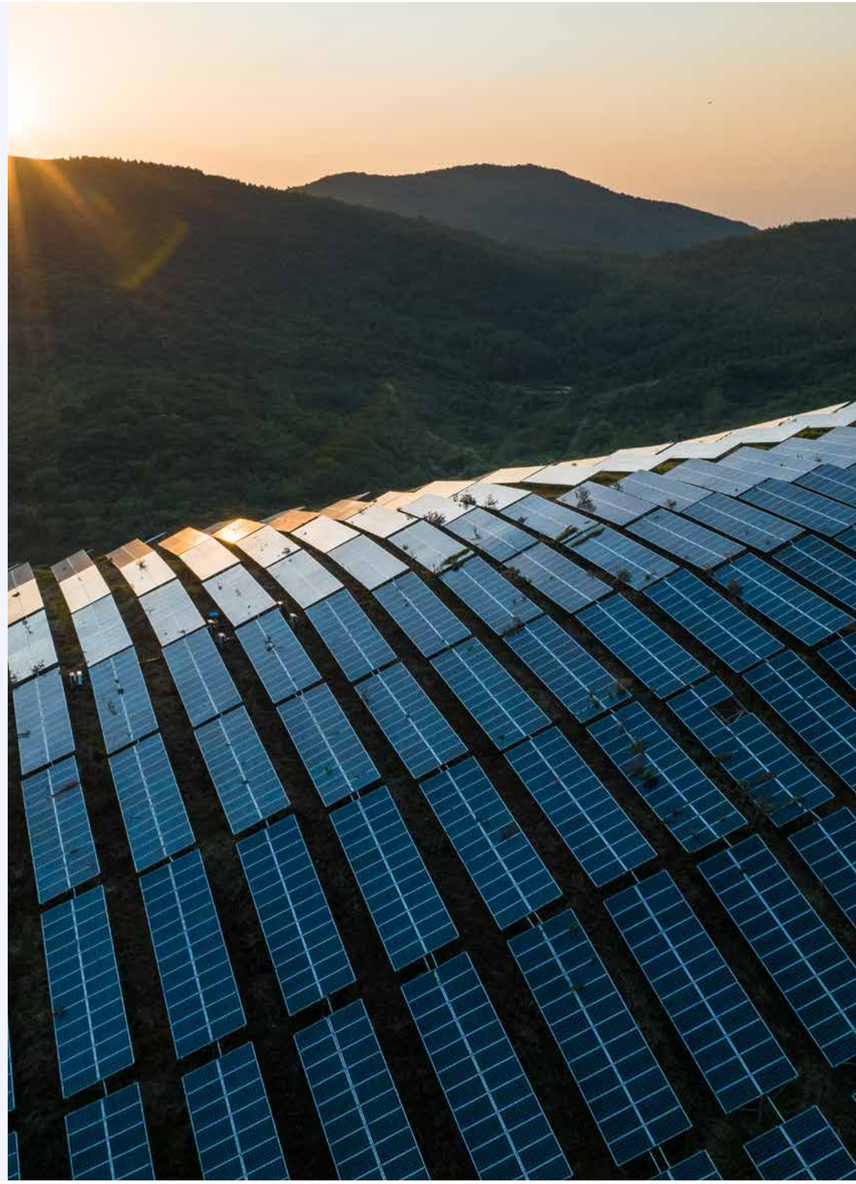
Tesla's market capitalisation grew rapidly between 2019 and 2020 and has fluctuated significantly over the past five years. It reached over US$1 trillion by the end of 2024 but dropped by over US$400 billion in the first quarter of 2025.

In contrast, company revenue has grown more steadily over the same period. This significant discrepancy is reflected in the green revenue exposure of the Automobiles industry in the Americas, which is only 22% in 2024.

Figure 63. Green giant on the move: Tesla



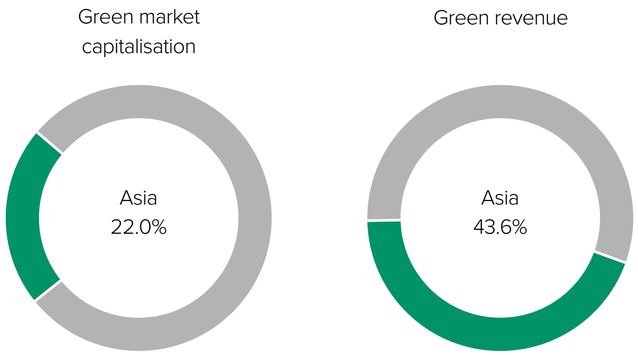
Source: LSEG



Asia

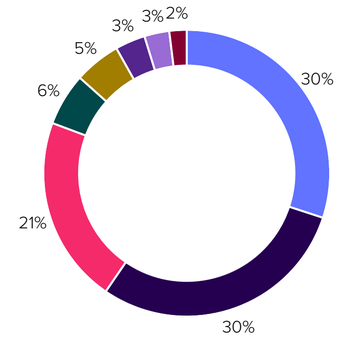
Despite a much lower market capitalisation, Asia generates most of the global green revenue at 44%, which is 13 percentage points higher than the Americas. As shown in Figure 65, Taiwan and China lead the green economy in Asia, with each representing 30% of the green economy, followed by Japan at 21%. Taiwan's green economy is almost solely driven by TMSC, which has both high market capitalisation and large share of green revenue for their businesses (Box 8). In terms of green revenue generation, however, China leads the region, producing over one-third of Asia's green revenue, followed by Japan (29%) and Hong Kong (11%). Taiwan falls behind, contributing to only 4% of the region's green revenue (Figure 66).

Figure 64. Regional share of the green economy from Asia



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG revenues data as of 1 April 2025)

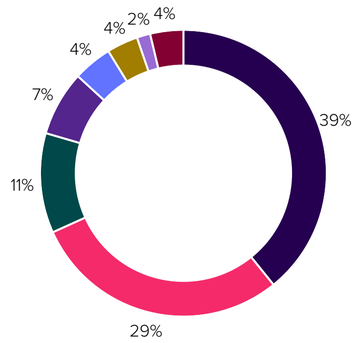
Figure 65. Green market capitalisation by market in Asia



- Taiwan
- China
- Japan
- Hong Kong
- India
- Korea; Republic (S. Korea)
- Singapore
- Other

Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025.

Figure 66. Green revenue by market in Asia



- China
- Japan
- Hong Kong
- Korea; Republic (S. Korea)
- Taiwan
- India
- Singapore
- Other

Source: LSEG Green Revenues data as of 1 April 2024. LSEG revenue data as of December 2024.

Asia's green economy declined in Q1 2025, in line with the global downward trend. This was mainly driven by TSMC's decline of US$74 billion in green market capitalisation, with the rest of the green economy in Asia moving by less than US$1 billion in this quarter.

The green economy has fluctuated significantly over the last five years by market capitalisation, but green revenues from the region steadily increased. Companies in Automobiles and Parts sector lead the growth, for example:

- Toyota Motor's annual green revenues have increased by US$51 billion since 2019, reaching a total of US$92 billion in 2024, close to Tesla's $98 billion.
- BYD generated US$82 billion in green revenues in 2024, making up 9.4% of China's total green revenues.

Strong policy incentives for EV adoption in China help to drive Automobile sector growth. This includes direct subsidies for EV purchases, exemption from a 10% vehicle purchase tax, and heavy government investment in charging infrastructure.

However, these incentives have been seen as giving Chinese manufacturers an advantage globally, and some regions have placed tariffs on Chinese EVs as a result. In August 2024, the US raised tariffs on Chinese EVs from 25% to 100% with increasing tariffs on lithium-ion batteries and other EV components.[53] In October 2024, the EU also placed tariffs of up to 35% on certain Chinese automotive companies.[54]

Figure 67. Asia: Regional green economy 2016–2025

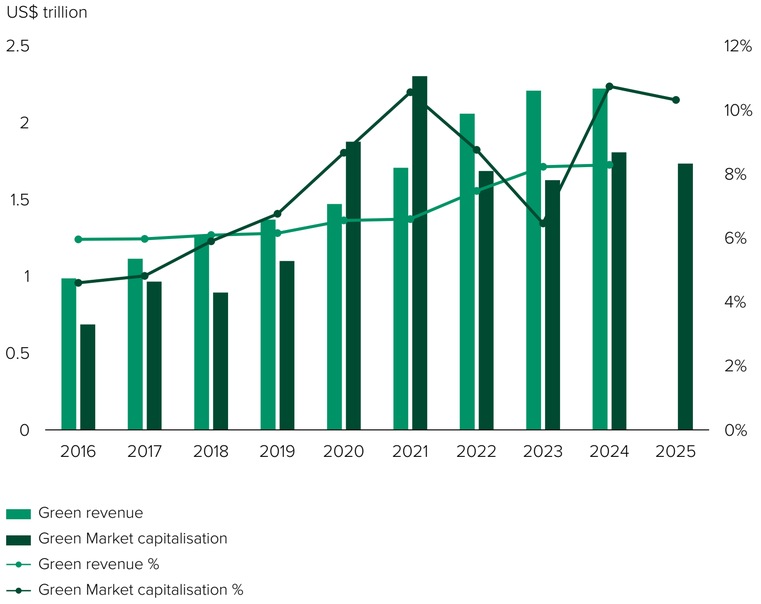
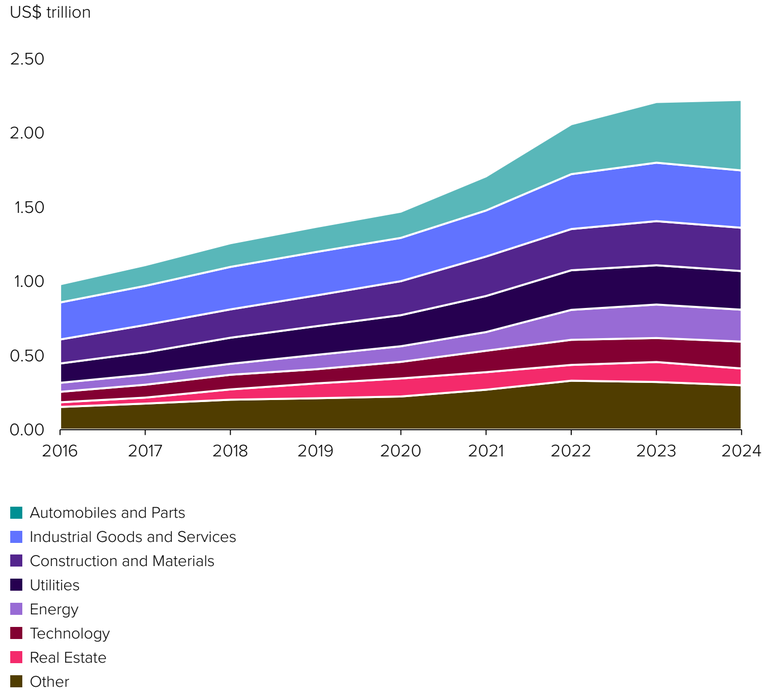


Figure 68. Asia: Green revenues of key industries in the green economy



Note: Green Revenue is calculated by aggregating all the green revenues from companies in the universe. Green Revenue % is calculated by dividing Green Revenue by total revenues from companies in the universe. Green market capitalisation is the Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues. Green market capitalisation % is calculated by dividing Green market capitalisation by total market capitalisation of companies in the universe. 2025 Green market capitalisation and Green market capitalisation % data is based on the latest Green Revenues data available (financial year 2022 or 2023) and the free float market capitalisation as of 1 April 2025.
Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG revenues data as of December 2024.

[53] *Reuters (2024): US locks in steep China tariff hikes, some industries warn of disruptions*
[54] *Reuters (2024): EU slaps tariffs on Chinese EVs, risking Beijing backlash | Reuters*

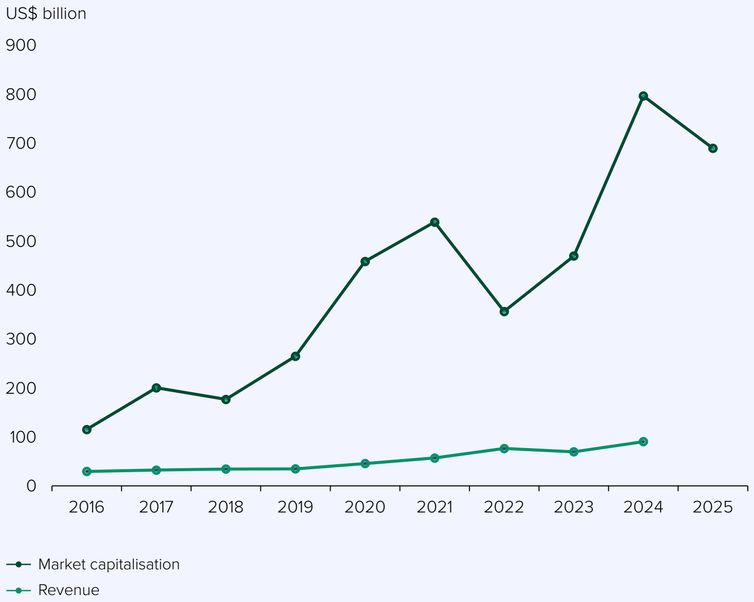
Box 8

Taiwan Semiconductor Manufacturing Co (TSMC)

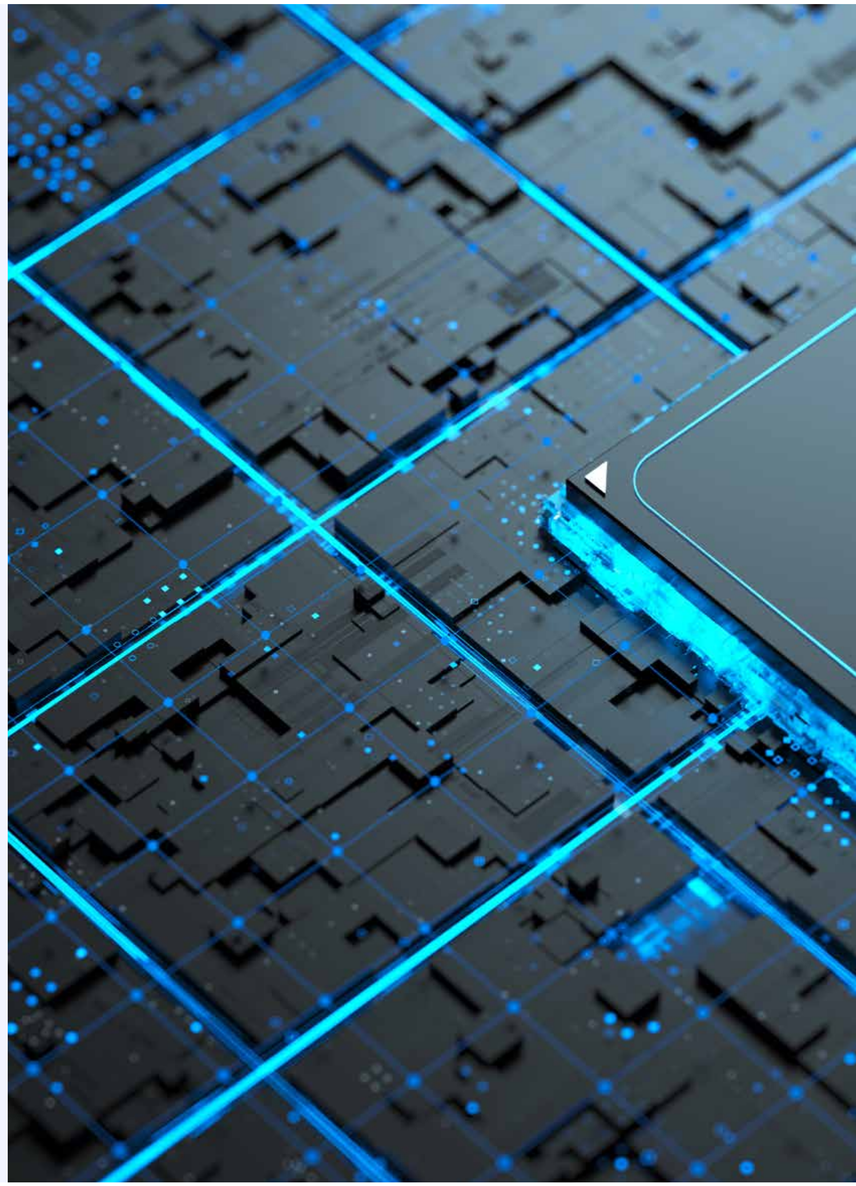
Taiwan is a standout in the markets across Asia, holding 30% of the green economy by market capitalisation, but only 4% of the green revenues. This is almost entirely driven by TSMC, which makes up 40% of Taiwan's economy, and 91% of its green economy.

TSMC generates 69% green revenues from the production of highly efficient semiconductors. Like Tesla, TSMC has a very high and volatile market capitalisation. The company holds a technological edge in the global semiconductor market. A robust international customer base provides the company with a strong valuation but also ties it into the turbulence in the global finance market.

Figure 69. TSMC: Semiconductor spikes



Source: LSEG free float market capitalisation data as of 1 April 2025. LSEG revenues data as of December 2024.

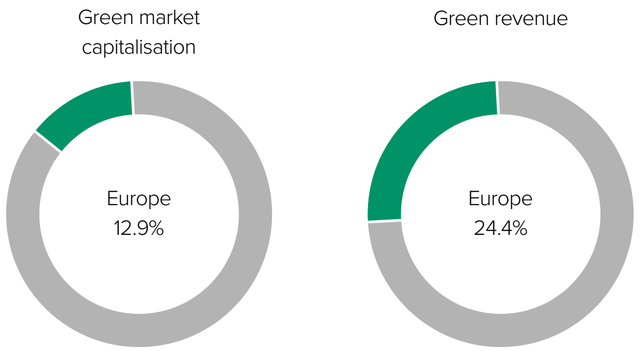


Europe

Europe's green economy has remained stable, with only modest fluctuations in green market capitalisation over the past five years. However, this stability is paired with the lack of growth. Since 2022, the region's share of the global green economy – both revenue and market capitalisation – has been gradually declining, in terms of. The absolute value of green market capitalisation is showing signs of a slow recovery from the 2022 market downturn, reaching over US$1 trillion at the end of Q1 2025. Meanwhile, absolute green revenues has slightly decreased from their peak of US$1.2 trillion in 2022.

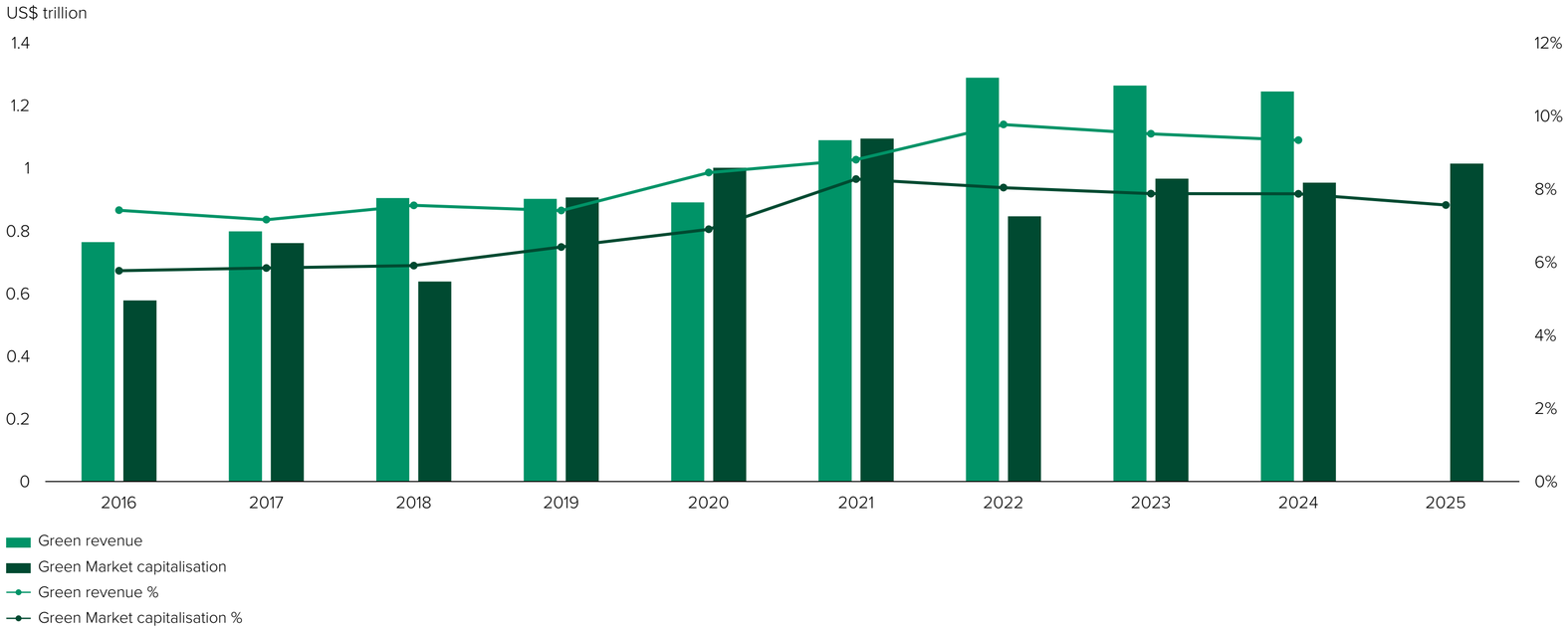
Several factors may be contributing to the stability of Europe's green economy, including a smaller number of high market-cap companies and greater diversification across markets within the region. Notably, Europe's green economy is characterised by higher green revenues relative to green market capitalisation – contrasting with the US, where growth and volatility are often driven by high green market-cap companies with comparatively lower green revenue.

Figure 70. Regional share of the green economy from Europe



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025.

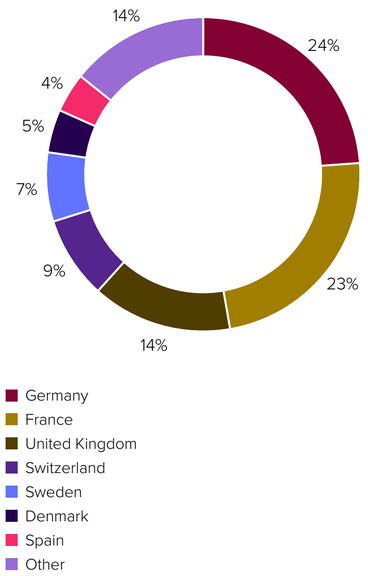
Figure 71. Europe: Regional green economy 2016–2025



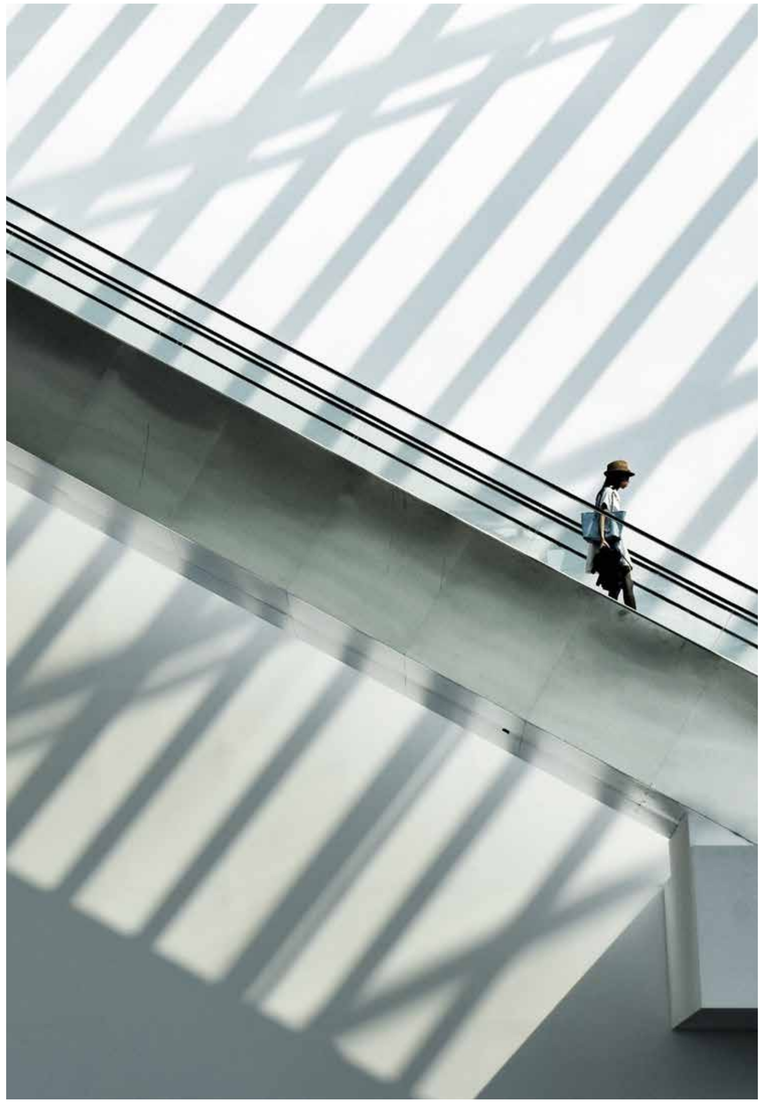
Note: Green Revenue is calculated by aggregating all the green revenues from companies in the universe. Green Revenue % is calculated by dividing Green Revenue by total revenues from companies in the universe. Green market capitalisation is the Green Revenue weighted market capitalisation, calculated by aggregating market capitalisation multiplied by company green revenues. Green market capitalisation % is calculated by dividing Green market capitalisation by total market capitalisation of companies in the universe. 2025 Green market capitalisation and Green market capitalisation % data is based on the latest Green Revenues data available (financial year 2022 or 2023) and the free float market capitalisation as of 1 April 2025.
Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG revenues data as of December 2024.

As shown in Figure 72, Europe's green economy is more evenly distributed across multiple countries, with no single country accounting for more than 25% of the region's green economy. This means the impacts of changes in any one country will have a smaller contributing impact on the green economy, reducing the potential for growth and risk of strong declines driven by single market.

Figure 72. Europe: Regional distribution of the green economy by market capitalisation



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025.



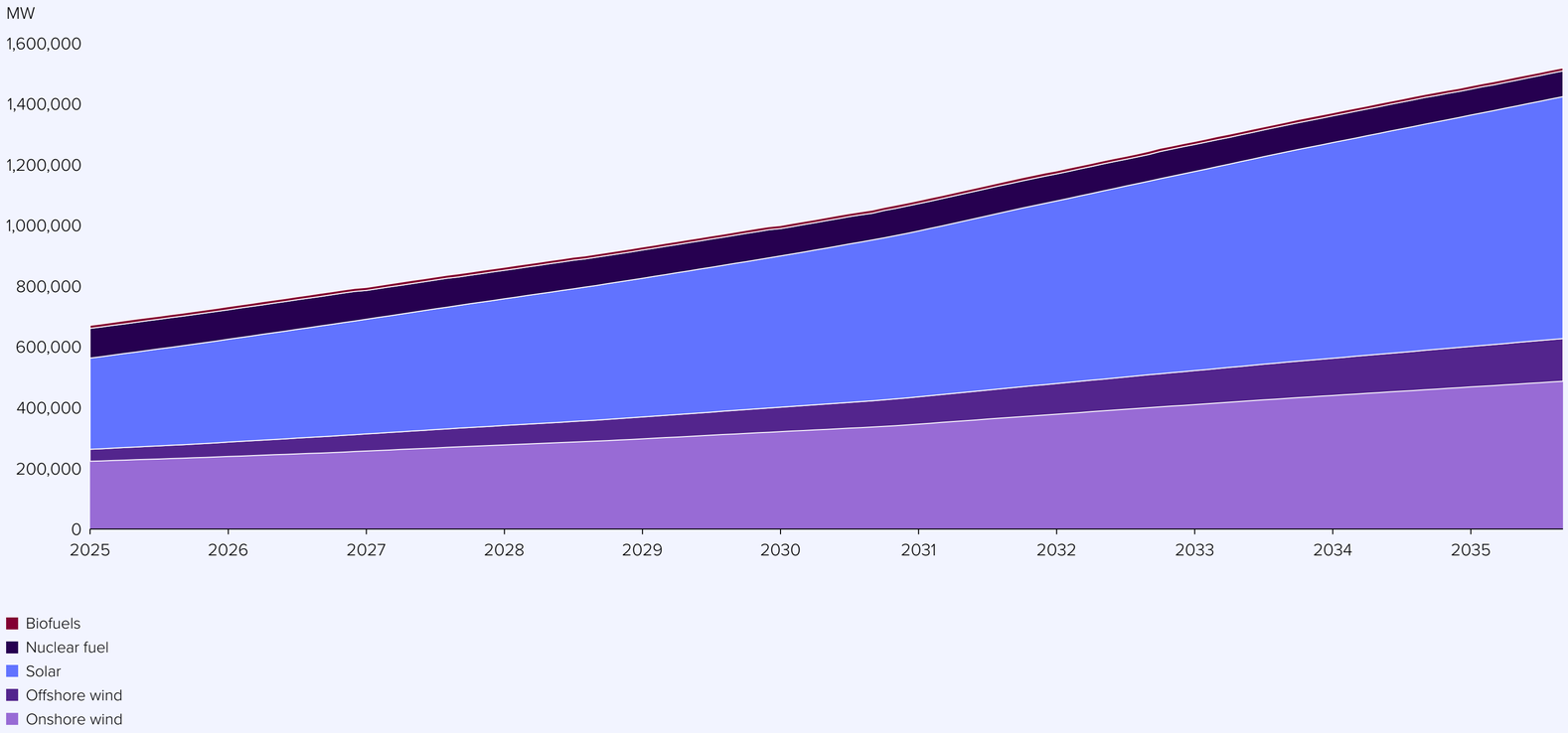
The green economy in Europe shows higher green revenues than green market capitalisation, contrasting with the high-market capitalisation, lower revenue companies driving growth and volatility in the US.

Box 9

Energy transition in Europe

Europe has seen an increase in renewables capacity which we expect to continue. Figure 73 shows the forecast growth in installed capacity for renewable energy generation on the continent, as of March 2025. With rapidly growing electricity demand, this expanding capacity may add to existing fossil fuel sources rather than replace them.

Figure 73. Projected installed capacity of renewables in Europe

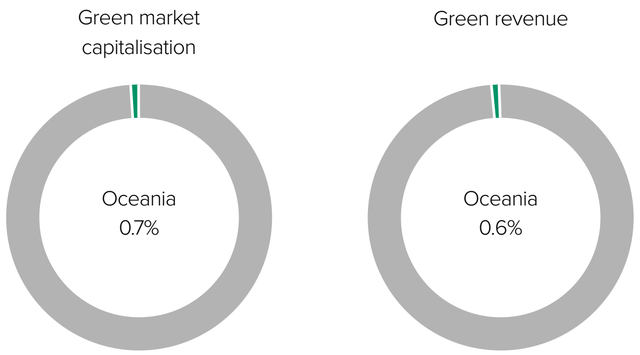


Source: LSEG, 2024

Oceania

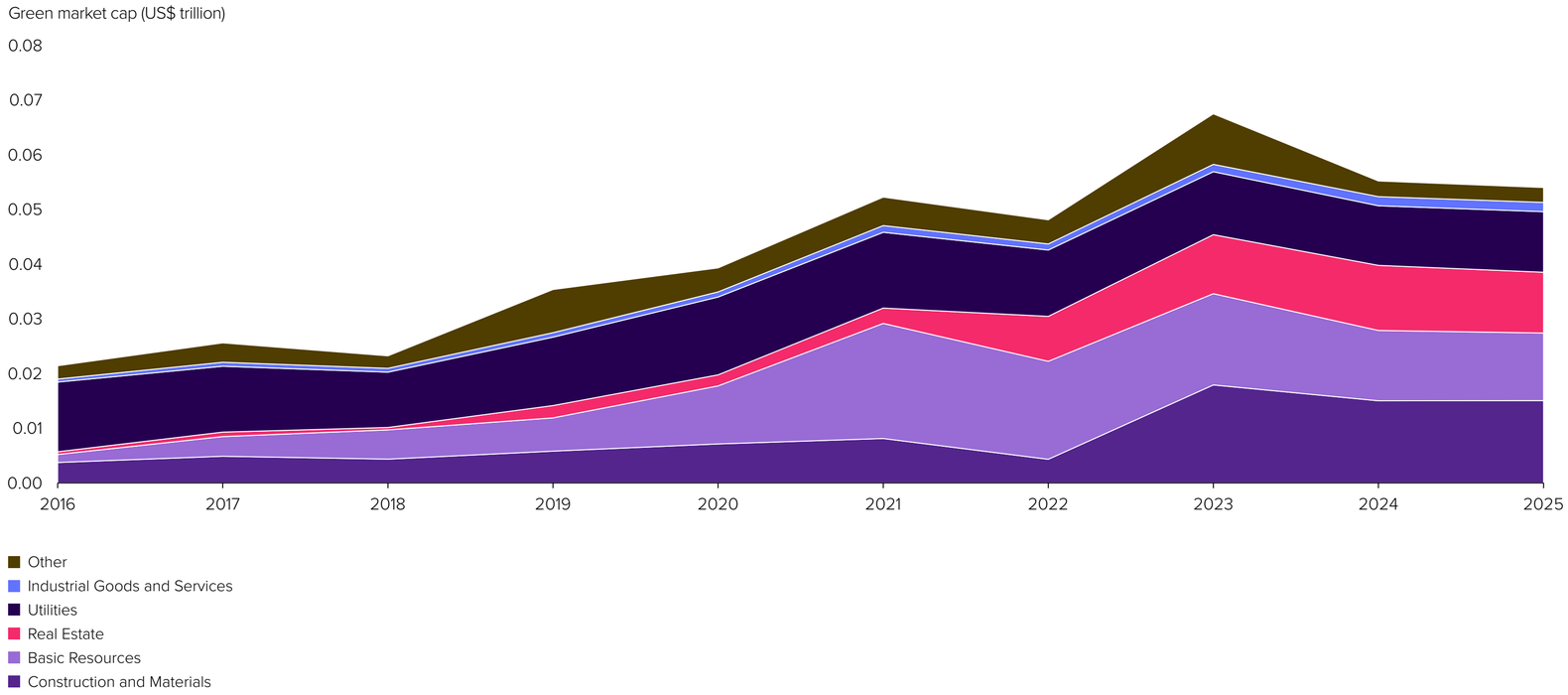
Oceania represents less than 1% of the global green economy, driven largely by Real Estate, Construction and Materials, and Basic Resources industries.

Figure 74. Regional share of the green economy from Oceania



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG revenues data as of December 2024.

Figure 75. Oceania: Key industries in the green economy

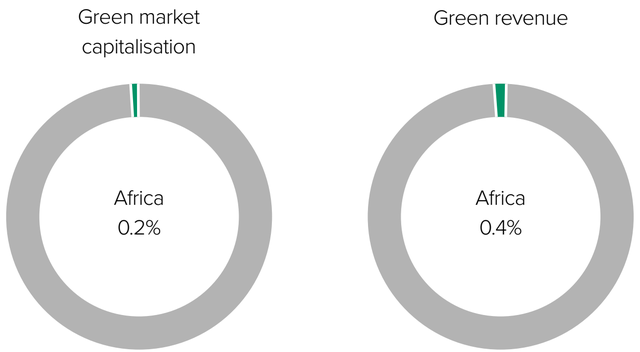


Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025.

Africa

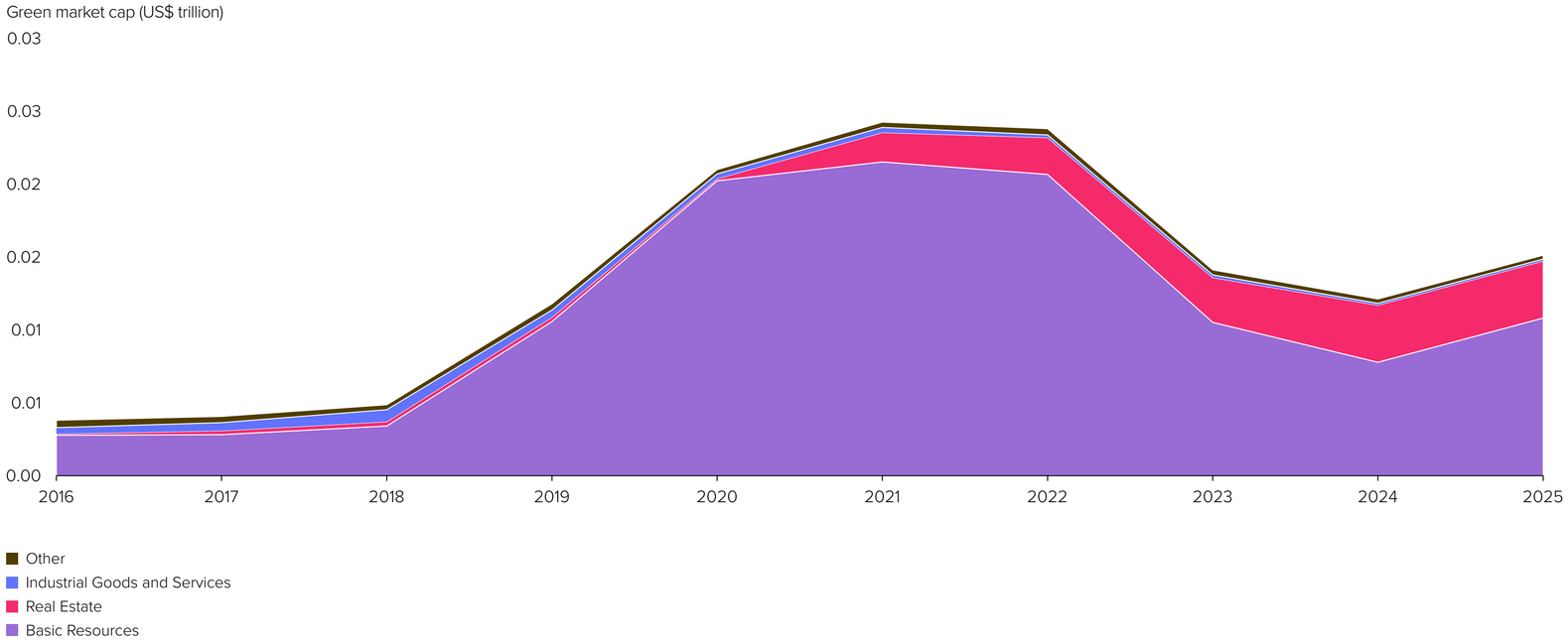
Similarly, Africa remains a small part of the global green economy and is almost entirely driven by the Basic Resources sector. This includes mining for key raw materials used in areas such as energy efficiency technology, batteries, and renewable energy generation equipment.

Figure 76. Regional share of the green economy from Africa



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025. LSEG Revenue data as of December 2024.

Figure 77. Africa: Key industries in the green economy



Source: LSEG Green Revenues data as of 1 April 2024. LSEG free float market capitalisation data as of 1 April 2025.

Appendix 1

GRCS micro sectors with contribution to climate change adaptation

See the full GRCS sectors, subsectors and microsectors here: Green Revenues Classification System

Table 4. LSEG Green Revenues Classification System (GRCS). Micro sectors with contribution to adaptation are shown in blue

ENERGY GENERATION [EG]	ENERGY MANAGEMENT & EFFICIENCY [EM]	ENERGY EQUIPMENT [EQ]	ENVIRONMENTAL RESOURCES [ER]	ENVIRONMENTAL SUPPORT SERVICES [ES]
19	13	22	11	5
Bio Fuels	**Buildings & Property (Integrated)**	Bio Fuels	**Advanced & Light Materials**	**Environmental Consultancies**
Bio Gas	Controls	Bio Fuel (1st & 2nd Generation)	Key Raw Minerals & Metals	Finance & Investment
Bio Mass (Grown)	**Energy Management Logistics & Support**	Bio Fuel (3rd Generation)	Cobalt	Carbon Credits trading
Bio Mass (Waste)	Industrial Processes	Bio Gas	Lithium	Sustainable Investment Funds
Cogeneration	IT Processes	Bio Mass (grown)	Platinum & Platinum-Group Metals (PGM)	**Smart City Design & Engineering**
Cogeneration (Biomass)	Cloud Computing	Bio Mass (waste)	Rare Earths	
Cogeneration (Renewable)	Efficient IT	Cogeneration Equipment	Silica	
Cogeneration (Gas)	Lighting	Cogeneration (Biomass)	Uranium	
Clean Fossil Fuels	Power Storage	Cogeneration (Renewable)	Recyclable Products & Materials	
Geothermal	Power storage (Battery)	Cogeneration (Gas)	Recyclable Materials	
Hydro (General)	Power Storage (Pumped Hydro)	Carbon Capture & Storage	Recyclable & Reusable Products	
Large Hydro	**Smart and Efficient Grids**	Fuel Cells		
Small Hydro	Sustainable Property Operator	Geothermal		
Nuclear		Hydro (General)		
Ocean and Tidal		Large Hydro		
Solar (general)		Small Hydro		
Waste to Energy		Nuclear		
Wind (General)		Ocean and Tidal		
		Solar (General)		
		Waste to Energy		
		Wind (General)		

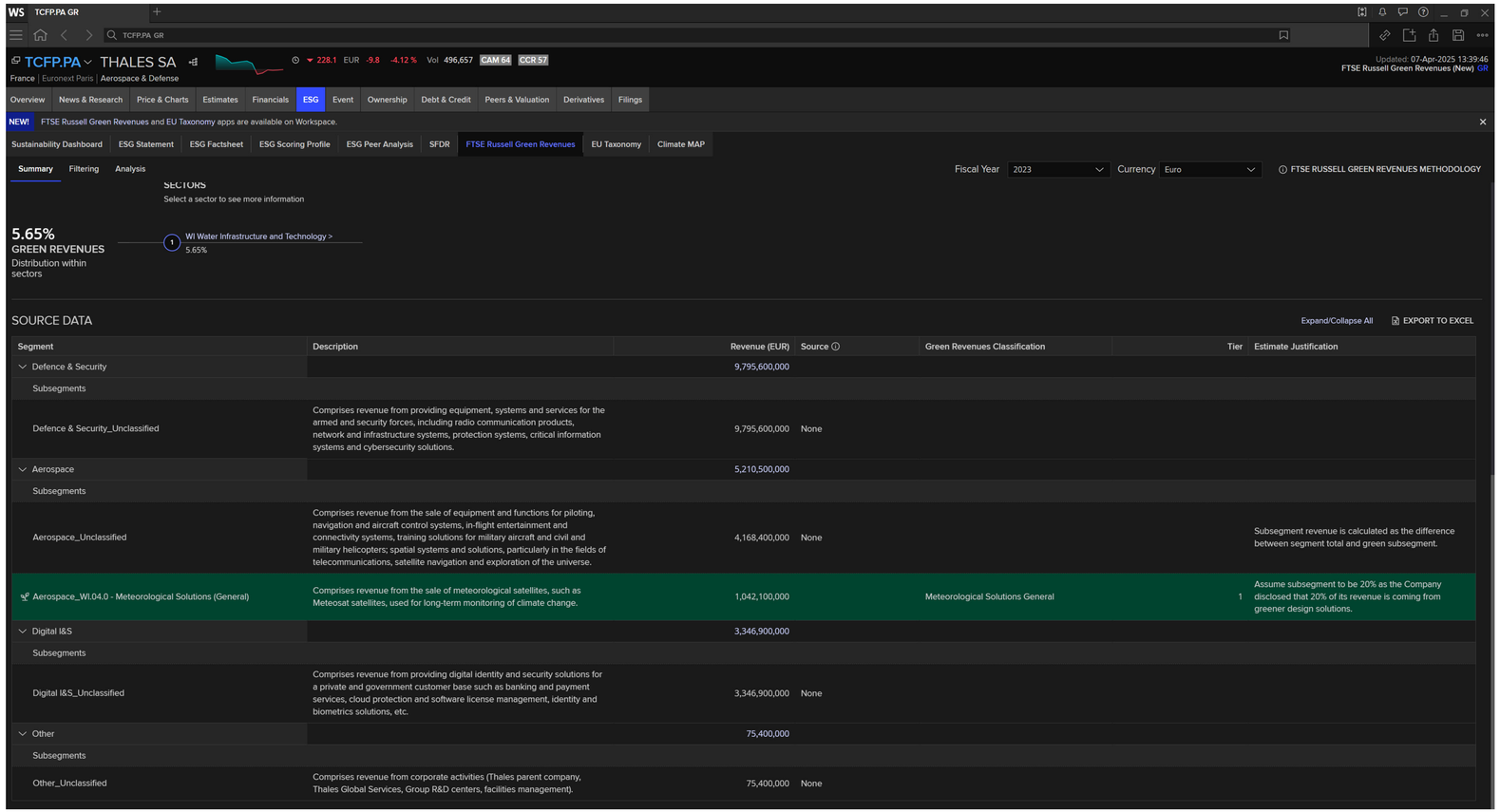
FOOD & AGRICULTURE [FA]	TRANSPORT EQUIPMENT [TE]	TRANSPORT SOLUTIONS [TS]	WASTE & POLLUTION CONTROL [WP]	WATER INFRASTRUCTURE & TECHNOLOGY [WI]
17	12	9	15	10
Agriculture	Aviation	Railways Operator	Cleaner Power	**Advanced Irrigation Systems & Devices**
GM Agriculture	Railways (General)	General Railways	**Decontamination Services & Devices**	**Desalination**
Machinery	Railway (Infrastructure)	Electrified Railways	**Air Decontamination Services & Devices**	**Flood Control**
Meat & Dairy Alternatives	Trains (Electric / Magnetic)	Road Vehicles	**Land & Soil Decontamination Services & Devices**	**Meteorological Solutions**
Non GM Advanced Seeds	Trains (General)	Bike sharing		**Natural Disaster Response**
Organic & Low-Impact Farming	Road Vehicles	Bus and Coach operators	**Sea & Water Decontamination Services & Devices**	**Water Infrastructure**
Aquaculture	Advanced Vehicle Batteries	Car Clubs	Environmental Testing & Gas Sensing	**Water Treatment**
Aquaculture (General)	Bikes and Bicycles	Ride Hailing	Particles & Emission Reduction Devices	Water Treatment Chemicals
Aquaculture (Sustainable)	Bus and Coach Manufacturers	Video Conferencing	Industrial Pollution Reduction	**Water Treatment Equipment**
Land Erosion	Electrified Road Vehicles & Devices (incl Hydrogen powered)			Water Utilities
Logistics	Energy Use Reduction Devices			
Food Safety, Efficient Processing & Sustainable Packaging	Shipping			
Food Safety, Efficient Processing & Sustainable Packaging (no single use plastic)				
Food Safety, Efficient Processing & Sustainable Packaging (with single use plastic)				
Sustainable Planations				
Sustainable Forestry				
Sustainable Palm Oil				

Appendix 2

Full assessment of companies providing adaptation solutions

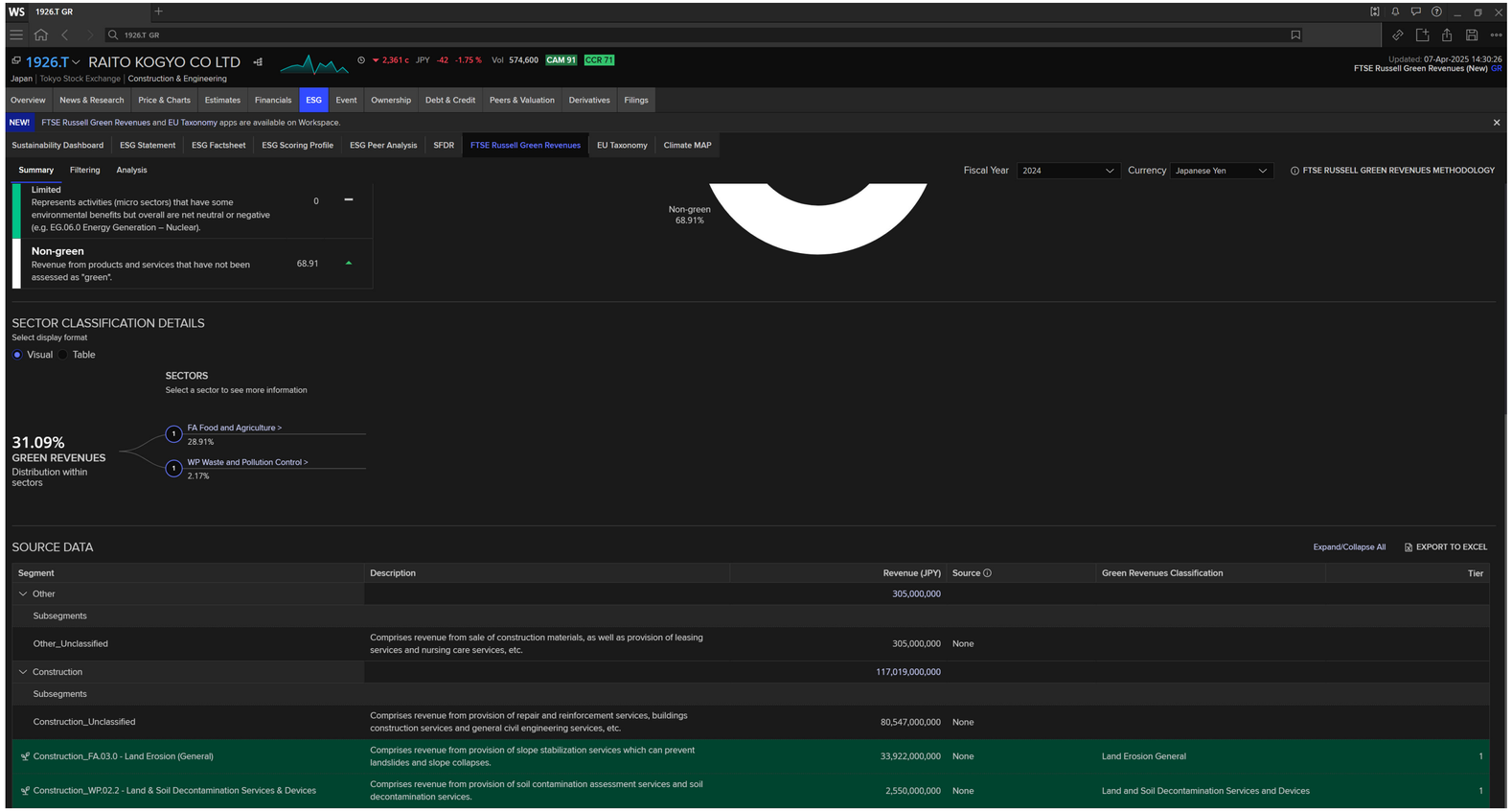
Four examples of companies providing adaptation solutions were shown in Table 1, in chapter 4. The full assessment of the company activities are included here.

Example 1: Thales

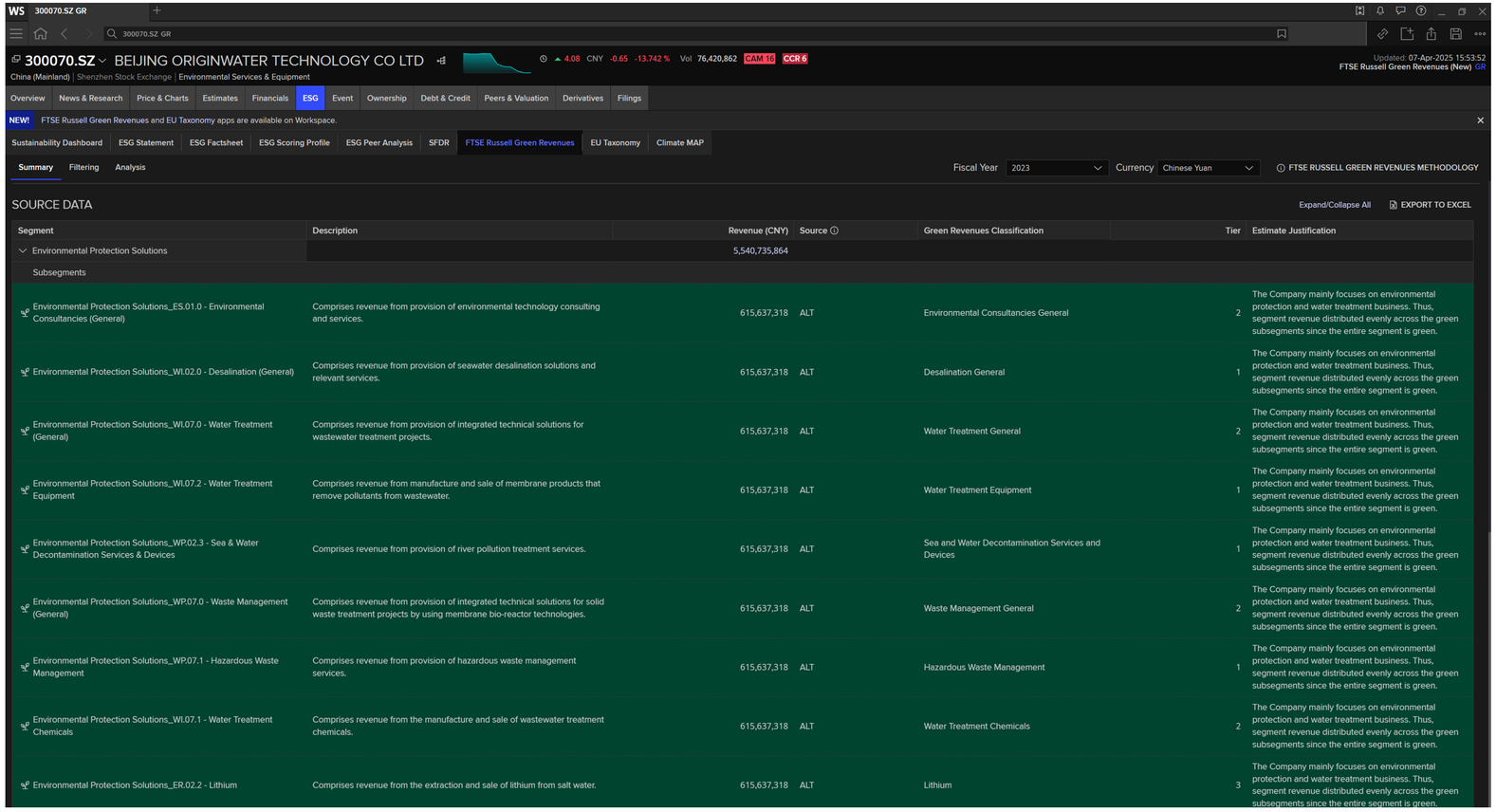


Segment	Description	Revenue (EUR)	Source	Green Revenues Classification	Tier	Estimate Justification
Defence & Security		9,795,600,000				
Subsegments						
Defence & Security_Unclassified	Comprises revenue from providing equipment, systems and services for the armed and security forces, including radio communication products, network and infrastructure systems, protection systems, critical information systems and cybersecurity solutions.	9,795,600,000	None			
Aerospace		5,210,500,000				
Subsegments						
Aerospace_Unclassified	Comprises revenue from the sale of equipment and functions for piloting, navigation and aircraft control systems, in-flight entertainment and connectivity systems, training solutions for military aircraft and civil and military helicopters; spatial systems and solutions, particularly in the fields of telecommunications, satellite navigation and exploration of the universe.	4,168,400,000	None			Subsegment revenue is calculated as the difference between segment total and green subsegment.
Aerospace_WI.04.0 - Meteorological Solutions (General)	Comprises revenue from the sale of meteorological satellites, such as Meteosat satellites, used for long-term monitoring of climate change.	1,042,100,000		Meteorological Solutions General	1	Assume subsegment to be 20% as the Company disclosed that 20% of its revenue is coming from greener design solutions.
Digital I&S		3,346,900,000				
Subsegments						
Digital I&S_Unclassified	Comprises revenue from providing digital identity and security solutions for a private and government customer base such as banking and payment services, cloud protection and software license management, identity and biometrics solutions, etc.	3,346,900,000	None			
Other		75,400,000				
Subsegments						
Other_Unclassified	Comprises revenue from corporate activities (Thales parent company, Thales Global Services, Group R&D centers, facilities management).	75,400,000	None			

Example 2: Raito Kogyo



Example 3: Beijing Originwater Technology



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300070.SZ BEIJING ORIGINWATER TECHNOLOGY CO LTD 4.08 CNY -0.65 -13.742 % Vol 76,420,862 CAM 16 CCR 6

China (Mainland) | Shenzhen Stock Exchange | Environmental Services & Equipment

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Fiscal Year 2023 Currency Chinese Yuan FTSE RUSSELL GREEN REVENUES METHODOLOGY

SOURCE DATA

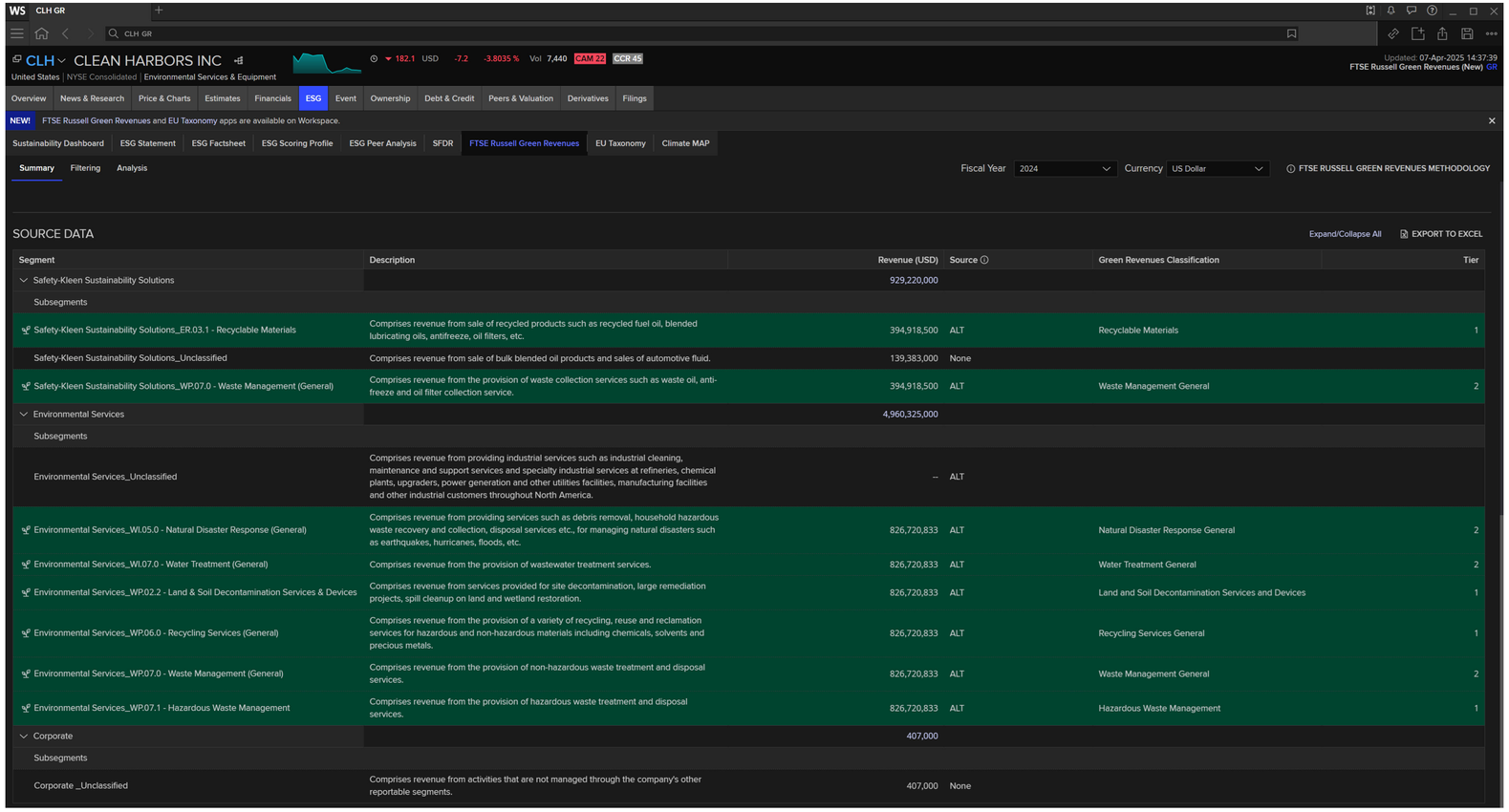
Expand/Collapse All EXPORT TO EXCEL

Segment	Description	Revenue (CNY)	Source	Green Revenues Classification	Tier	Estimate Justification
Environmental Protection Solutions		5,540,735,864				
Subsegments						
Environmental Protection Solutions_ES.01.0 - Environmental Consultancies (General)	Comprises revenue from provision of environmental technology consulting and services.	615,637,318	ALT	Environmental Consultancies General	2	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WI.02.0 - Desalination (General)	Comprises revenue from provision of seawater desalination solutions and relevant services.	615,637,318	ALT	Desalination General	1	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WI.07.0 - Water Treatment (General)	Comprises revenue from provision of integrated technical solutions for wastewater treatment projects.	615,637,318	ALT	Water Treatment General	2	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WI.07.2 - Water Treatment Equipment	Comprises revenue from manufacture and sale of membrane products that remove pollutants from wastewater.	615,637,318	ALT	Water Treatment Equipment	1	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WP.02.3 - Sea & Water Decontamination Services & Devices	Comprises revenue from provision of river pollution treatment services.	615,637,318	ALT	Sea and Water Decontamination Services and Devices	1	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WP.07.0 - Waste Management (General)	Comprises revenue from provision of integrated technical solutions for solid waste treatment projects by using membrane bio-reactor technologies.	615,637,318	ALT	Waste Management General	2	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WP.07.1 - Hazardous Waste Management	Comprises revenue from provision of hazardous waste management services.	615,637,318	ALT	Hazardous Waste Management	1	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_WI.07.1 - Water Treatment Chemicals	Comprises revenue from the manufacture and sale of wastewater treatment chemicals.	615,637,318	ALT	Water Treatment Chemicals	2	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_ER.02.2 - Lithium	Comprises revenue from the extraction and sale of lithium from salt water.	615,637,318	ALT	Lithium	3	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.

Example 3: Beijing Originwater Technology (continued)

Environmental Protection Solutions_WI.07.1 - Water Treatment Chemicals	Comprises revenue from the manufacture and sale of wastewater treatment chemicals.	615,637,318	ALT	Water Treatment Chemicals	2	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Environmental Protection Solutions_ER.02.2 - Lithium	Comprises revenue from the extraction and sale of lithium from salt water.	615,637,318	ALT	Lithium	3	The Company mainly focuses on environmental protection and water treatment business. Thus, segment revenue distributed evenly across the green subsegments since the entire segment is green.
Operation Service		2,723,696,792				
Subsegments						
Operation Service_WI.08.0 - Water Utilities (General)	Comprises revenue from provision of water supply and operation of water services from sewage treatment plant, tap water and other government payments.	2,723,696,792	None	Water Utilities General	2	
Municipal Water Supply and Drainage Engineering		466,823,727				
Subsegments						
Municipal Water Supply and Drainage Engineering_Unclassified	Comprises revenue from provision of other engineering construction services such as roads and bridges.	70,023,559	None			Subsegment revenue calculated as the difference between segment revenue and the estimated green revenue.
Municipal Water Supply and Drainage Engineering_WI.03.0 - Flood Control (General)	Comprises revenue from provision of drainage engineering services and river basin management services.	198,400,084	ALT	Flood Control General	2	Assume 85% of segment revenue to be green, divided equally between the two green subsegments, as the report indicates the segment focuses on green activities.
Municipal Water Supply and Drainage Engineering_WI.06.0 - Water Infrastructure (General)	Comprises revenue from provision of water infrastructure, water supply facilities engineering, etc.	198,400,084	ALT	Water Infrastructure General	1	Assume 85% of segment revenue to be green, divided equally between the two green subsegments, as the report indicates the segment focuses on green activities.
Light Technology Solutions		221,698,528				
Subsegments						
Light Technology Solutions_Unclassified	Comprises revenue from sale of illumination lamps and provision of urban light environment solutions.	147,799,018	None			Subsegment revenue calculated as the difference between segment revenue and EM Lighting.
Light Technology Solutions_EM.06.0 - Lighting (General)	Comprises revenue from provision of smart lighting poles for street lighting.	73,899,509	ALT	Lighting General	1	Light Technology Solutions (LTS) provides light and shadow cultural tourism products, smart lighting products and smart home products. Smart lighting is generating green revenue. Assume 1/3 of total segment revenue is for EM Lighting.

Example 4: Clean Harbor



Segment	Description	Revenue (USD)	Source	Green Revenues Classification	Tier
Safety-Kleen Sustainability Solutions		929,220,000			
Subsegments					
Safety-Kleen Sustainability Solutions_ER.03.1 - Recyclable Materials	Comprises revenue from sale of recycled products such as recycled fuel oil, blended lubricating oils, antifreeze, oil filters, etc.	394,918,500	ALT	Recyclable Materials	1
Safety-Kleen Sustainability Solutions_Unclassified	Comprises revenue from sale of bulk blended oil products and sales of automotive fluid.	139,383,000	None		
Safety-Kleen Sustainability Solutions_WP.07.0 - Waste Management (General)	Comprises revenue from the provision of waste collection services such as waste oil, anti-freeze and oil filter collection service.	394,918,500	ALT	Waste Management General	2
Environmental Services		4,960,325,000			
Subsegments					
Environmental Services_Unclassified	Comprises revenue from providing industrial services such as industrial cleaning, maintenance and support services and specialty industrial services at refineries, chemical plants, upgraders, power generation and other utilities facilities, manufacturing facilities and other industrial customers throughout North America.	--	ALT		
Environmental Services_WI.05.0 - Natural Disaster Response (General)	Comprises revenue from providing services such as debris removal, household hazardous waste recovery and collection, disposal services etc., for managing natural disasters such as earthquakes, hurricanes, floods, etc.	826,720,833	ALT	Natural Disaster Response General	2
Environmental Services_WI.07.0 - Water Treatment (General)	Comprises revenue from the provision of wastewater treatment services.	826,720,833	ALT	Water Treatment General	2
Environmental Services_WP.02.2 - Land & Soil Decontamination Services & Devices	Comprises revenue from services provided for site decontamination, large remediation projects, spill cleanup on land and wetland restoration.	826,720,833	ALT	Land and Soil Decontamination Services and Devices	1
Environmental Services_WP.06.0 - Recycling Services (General)	Comprises revenue from the provision of a variety of recycling, reuse and reclamation services for hazardous and non-hazardous materials including chemicals, solvents and precious metals.	826,720,833	ALT	Recycling Services General	1
Environmental Services_WP.07.0 - Waste Management (General)	Comprises revenue from the provision of non-hazardous waste treatment and disposal services.	826,720,833	ALT	Waste Management General	2
Environmental Services_WP.07.1 - Hazardous Waste Management	Comprises revenue from the provision of hazardous waste treatment and disposal services.	826,720,833	ALT	Hazardous Waste Management	1
Corporate		407,000			
Subsegments					
Corporate _Unclassified	Comprises revenue from activities that are not managed through the company's other reportable segments.	407,000	None		

Visit our Green Economy Solutions page to learn more about the trends defining the evolution of the green economy.

London Stock Exchange Group plc
10 Paternoster Square
London EC4M 7LS
Telephone +44 (0)20 7797 1000

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