



—
Investing for a
world of change

The case for a decarbonization allocation

November 2024

—
For professional investors and financial advisors only. Not for distribution to the public or
within a country where distribution would be contrary to applicable law or regulations.

Contents

1.

2.

3.

4.

5.

1 Introduction: a distinctive, differentiated equity allocation

For holders of global equity portfolios, it can be challenging to find investment strategies that offer something different in terms of portfolio composition and return profile.

Equity strategies focused on decarbonization – specifically, on the shares of companies whose products and services are in demand as the world tries to reduce carbon emissions – are a potential answer. We believe a decarbonization allocation can complement a core global equity portfolio, bringing diversification benefits and offering the potential for uncorrelated returns.

This paper explores the following characteristics of decarbonization from the perspective of an equity investor (see the Contents for an overview of the paper's structure):

A focus on structural growth

We explain why a decarbonization allocation offers exposure to parts of the economy that are experiencing structural growth, which we expect to persist through the economic cycle.

A distinctive equity exposure

We explore how the decarbonization universe offers equity exposure distinct from a broad global equity allocation, and hence can result in a portfolio with a differentiated return profile.

A diversified and differentiated opportunity set

We describe where the decarbonization investment opportunities lie. While they span industries and market capitalizations, they can broadly be grouped into three 'pathways' to a low-carbon economy: renewable energy, electrification, and resource efficiency. We also view the decarbonization opportunity set through a regional lens, focusing on emerging markets, especially China.

For each decarbonization pathway, we consider:

- The primary drivers of structural growth.
- The key determinants of continued growth, in terms of policy, technological change, and consumer behavior.
- An example of a company within the pathway, and the investment rationale for holding it in a decarbonization portfolio. Our aim here is to highlight that, while decarbonization is a common tailwind for companies within the pathway, we favour an active, highly selective investment approach because the stock 'story' for an individual decarbonization-exposed company is usually idiosyncratic.

A distinctive return profile

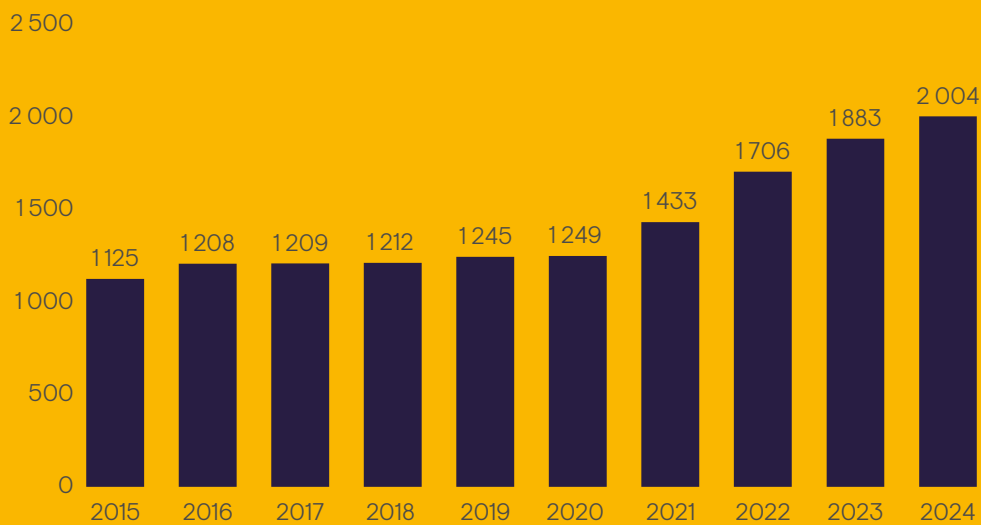
We assess Global Environment's historical return profile vs. quality, value, growth, and momentum factors, highlighting the diversifying role the strategy can play.

2 Growth in decarbonization spending is creating a large opportunity set

A decarbonization allocation offers exposure to parts of the global economy that are experiencing structural growth, which we expect to persist through economic cycles for decades.

According to the International Energy Agency (IEA), climate financing globally increased by about 80% between 2015-2024, from c.US\$1.1 trillion to c.US\$2.0 trillion (in today's money). Despite this, climate spending remains well below the level required to keep within a 1.5-degree or even 2-degree global-warming scenario, which the Climate Policy Initiative estimates at c.US\$6 trillion each year, three times the current level.

Clean energy investment (US\$bn, in 2023 terms)

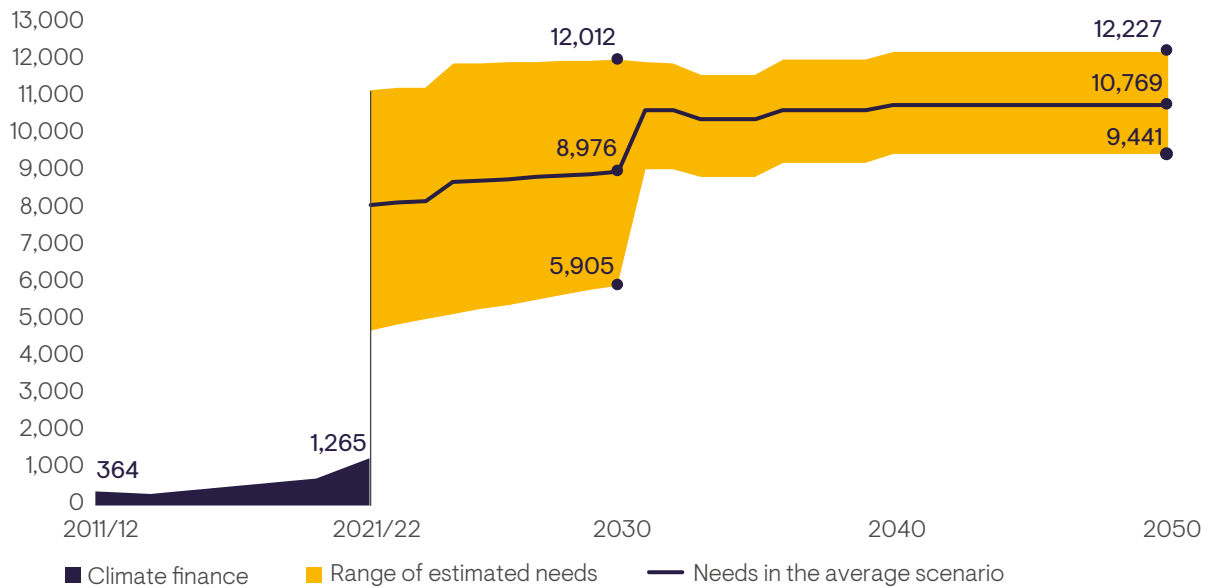


Source: IEA World Energy Investment, 2024.

The case for a decarbonization allocation

The substantial further increase in climate spending required to get close to the world's net-zero goals underpins the long-term potential of the decarbonization investment opportunity set. It gives us continued conviction in the long-term prospects of the companies in the decarbonization universe, and more specifically in the Ninety One Global Environment portfolio.

Current investment levels are not enough to limit global warming to 1.5°C



Source: Climate Policy Initiative, 2023.

Data from the IEA and IMF suggests that the capital flowing into decarbonization is generating global GDP growth of c.US\$320 billion, c.10% of total growth¹. This significantly increases the potential revenue growth of companies in decarbonization-linked supply chains. According to data from FTSE Russell², green revenues at the global equity index level increased to c.US\$5 trillion in 2023, a c.60% increase from c.US\$3 trillion in 2018.

Growth in our carbon avoided universe³ has been similar, with the market capitalization of our opportunity set increasing from c.US\$9 trillion in 2018 to US\$18 trillion in 2024. From a market-cap perspective, this puts the size of the opportunity set on par with the information technology sector in the MSCI ACWI, which has a combined market capitalization of approximately US\$19 trillion.

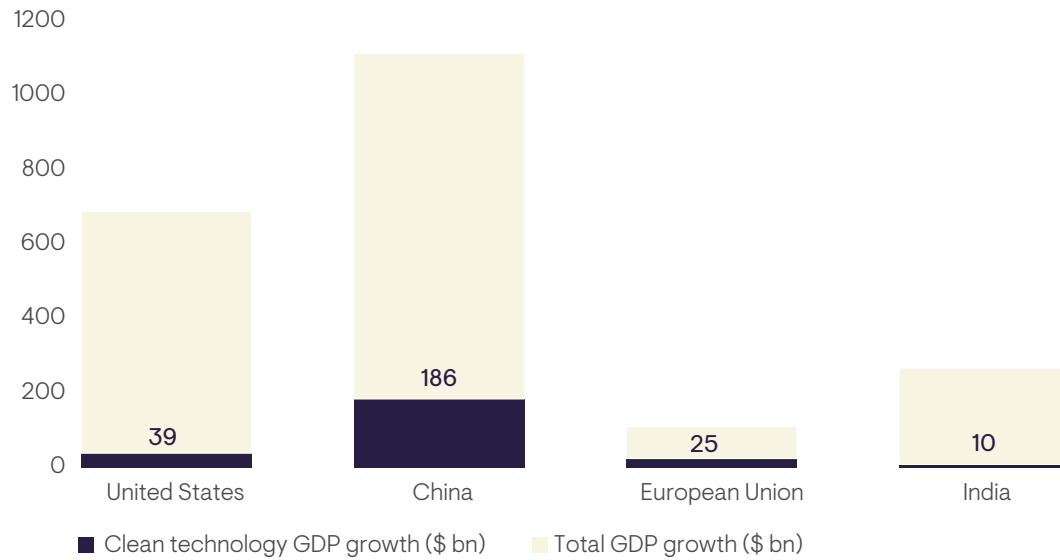
1. EA, 2024: [Clean energy is boosting economic growth – Analysis](#) - IEA.

2. [Investing in the green economy 2023 and 2024](#).

3. Comprising c.1,700 companies, the carbon avoided universe is a proprietary equity universe of companies across industries that we have identified as being positively exposed to decarbonization. It constitutes the opportunity set for the Global Environment strategy, from which we select stocks for the portfolio.

For further information on indices, please see the Important information.

Contribution of investment and sales in clean-energy technologies to GDP growth (US\$bn)



Source: IEA, IMF, Ninety One, 2024. The US, China, European Union and India have been selected to represent this dataset as they are four of the largest economies globally, representing two-thirds of global GDP.

At the broad level, then, positive trends in climate financing globally remain a powerful growth driver for companies providing products and solutions that are helping the world decarbonize. However, the specific beneficiaries of climate finance will depend on where exactly capital is being deployed. In addition, it is important to be aware that flows of climate finance will vary through time, depending on interest rates, policy, technological progress, and consumer-behavior change. More recently, the pace of decarbonization has slowed due to higher interest rates and populist politics in the US and Europe, which led to uncertainty and negative sentiment towards clean technology.

3 Understanding the investment opportunities within the decarbonization universe

While the decarbonization universe spans industries and the market-capitalization spectrum, it can broadly be divided into three 'pathways' to a low-carbon economy – renewable energy, electrification, and resource efficiency – within each of which a very substantial volume of capital is being deployed.

We profile each of these pathways below. We provide our outlook for the pathway, and showcase a company within it that we believe is well-positioned to benefit from decarbonization tailwinds. It can also be helpful to understand the decarbonization universe from a regional perspective. In the concluding part of this section, we explain why we believe emerging markets are a critical component of a decarbonization allocation.

Overall, the decarbonization investment universe offers differentiated exposure relative to a broad global equity index like the MSCI ACWI. There are approximately 1,700 companies in the decarbonization equity universe, as we define it, with a combined market capitalization of US\$18 trillion. But only 28% of these companies are constituents of the MSCI ACWI, and their collective weighting amounts to only 18% of the global equity benchmark⁴.

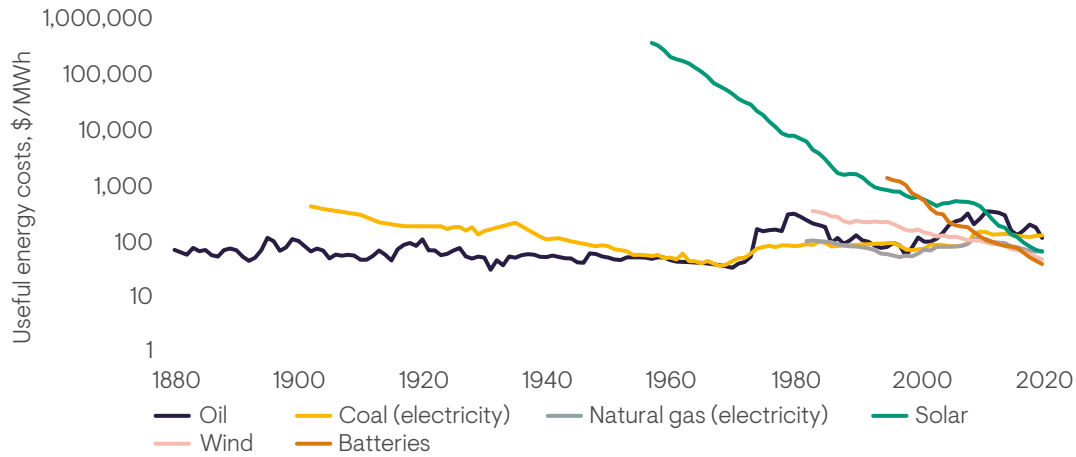
4. Source: Ninety One, March 2024.
For further information on indices, please see the Important information.

Renewable energy

Growth in solar and wind volumes provides an exciting backdrop

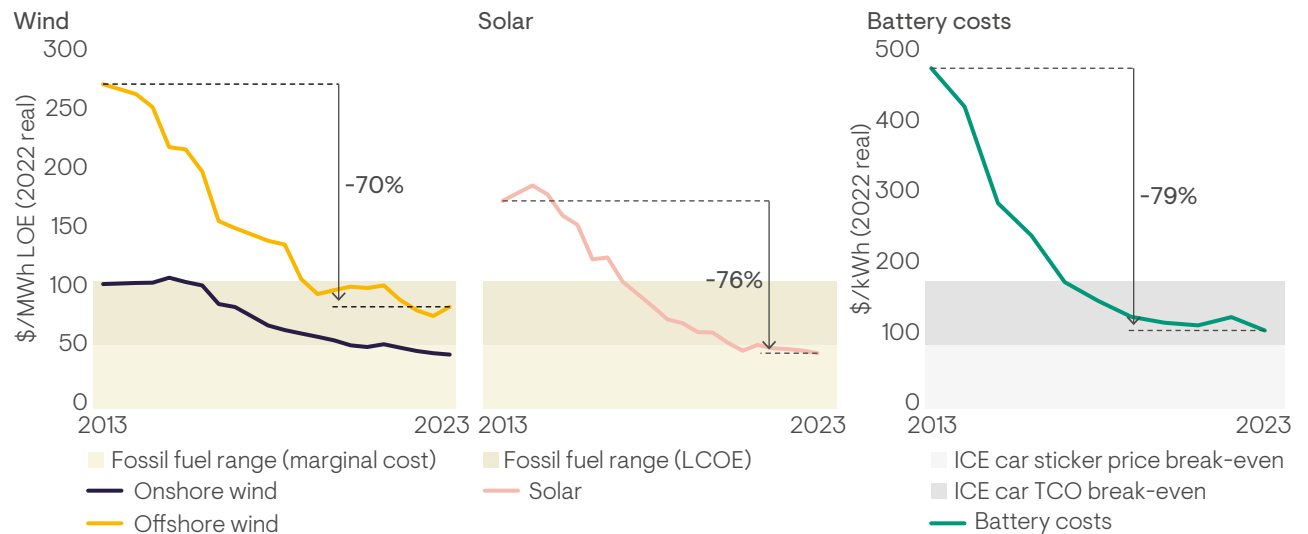
Since the inception of the Global Environment strategy in 2018, we have seen strong evidence of structural growth in the solar and wind energy sectors. The improving economics of renewable energy have contributed to the acceleration of solar and wind deployment, with these energy sources now cheaper than fossil fuels. These manufactured technologies have experienced cost declines of up to 80%⁵ in the past decade. Fossil fuels are not subject to the same cost declines, not least because of reserve depletion and price-setting by groups such as OPEC+.

Historical costs of energy sources



Source: Way et al, 2022; RMI, 2024.

Steep decline in renewables costs

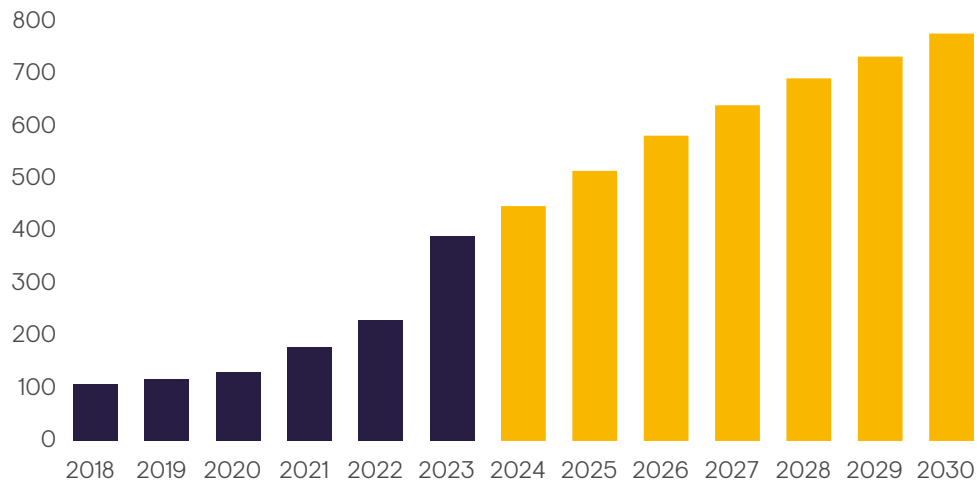


Source: BNEF, RMI 2024.

5. RMI, 2024.

Between 2018 and 2023, solar installations grew at a 24% compound annual growth rate (CAGR), from 100GW sold annually to 390GW. We forecast growth of c.10% p.a. to 2030, with a doubling of annual solar installations in 2030 vs. 2023.

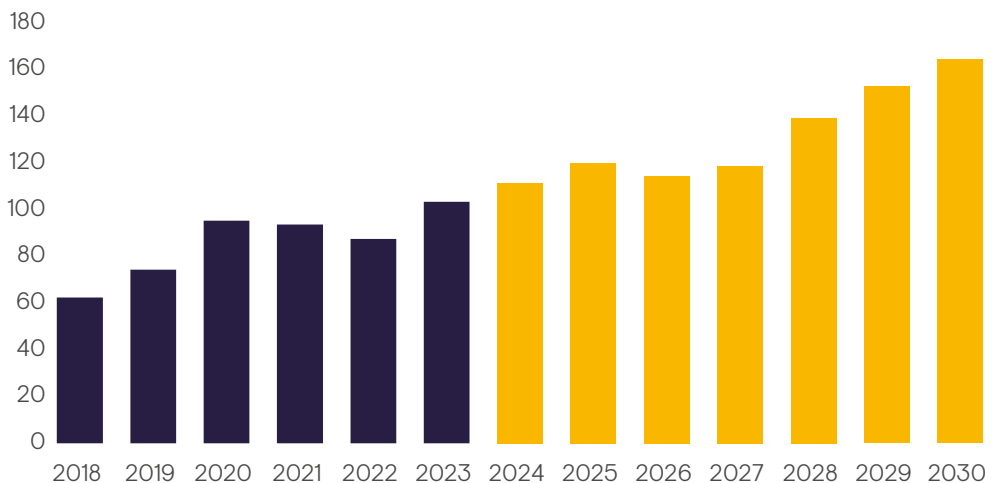
Annual solar installation (GW)



Source: BNEF, CPIA and Ninety One, 2024.

Despite significant challenges for the wind sector in 2022 and 2023 due to cost inflation, higher interest rates and increased competition, wind energy has still grown strongly, with annual wind installations increasing from 60GW in 2018 to more than 100GW in 2023. Under our base case, we expect annual installations to increase to c.165GW in 2030, a 60% increase vs. 2023.

Annual wind installation (GW)



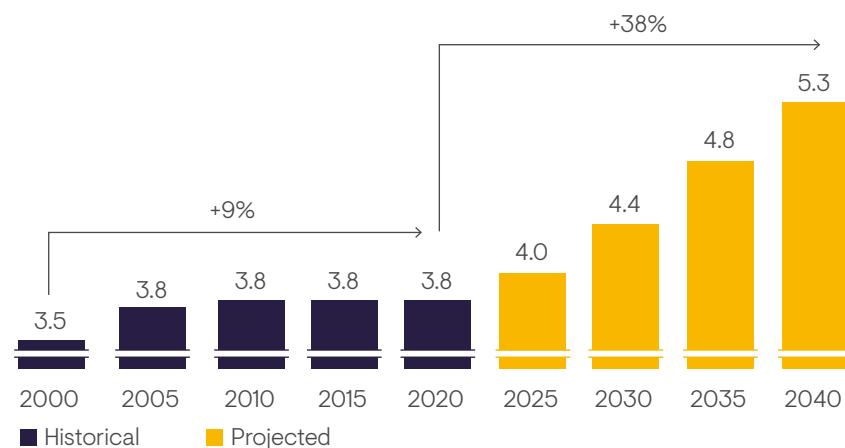
Source: BNEF, GWEC, CWEA and Ninety One, 2024.

The case for a decarbonization allocation

The wind and solar growth scenarios discussed above represent our base case. They would be revised upwards significantly under a net-zero scenario. In addition, they do not incorporate the potential power demand growth from artificial intelligence (AI), which is forecast to consume more than 85 terawatt hours annually within a couple of years, more than many small countries. This power demand growth from AI has the potential to significantly change trends in electricity demand in developed countries.

For decades, a combination of improving energy efficiency and offshoring of manufacturing have led to little or no electricity demand growth in advanced economies, despite increased electrification. Overall, McKinsey and the Energy Information Administration (EIA) expect a 38% increase in US power demand over the next two decades, a startling increase from the 9% increase seen over the previous 20 years.

Expected growth in US power demand (thousand TWh)



Source: NextEra Energy, EIA, McKinsey, 2024.

With AI leaders committed to net zero, we expect datacentre owners to obtain renewable-energy contracts, providing financial and market support for new renewables projects. This is also driving lower price-sensitivity: AI hyperscalers want to get as much renewable energy online as quickly as possible, giving pricing headroom across the entire renewables value chain.

Investment opportunity and outlook

The forecast growth in demand for renewable energy provides an exciting backdrop for clean-energy utilities developing and managing renewable-energy assets, and equipment manufacturers providing the components for wind turbines, solar modules, and other renewables technologies. While both sectors have had a challenging couple of years, the valuations of companies in the renewable-energy net-zero pathway look well-supported going forward, as we discuss below. Throughout this paper, we consider the outlook for companies within each pathway in terms of the three main drivers of decarbonization: policy, technological progress, and consumer-behavior change (not relevant in this case).

Policy: generally supportive and subject to less risk than consensus

- In the US, we view full Inflation Reduction Act (IRA) repeal as far less likely than the market thinks, and believe renewables development is protected by the fact that most clean-energy projects have been providing jobs to Republican states, as shown in the graphic below. However, with the Republicans taking control of all three branches of government, there is a reasonable probability that the term on renewables tax credits could be cut, from 2032 to perhaps 2028. While this could create further near-term volatility in the share prices of US renewables stocks, short-term demand for renewables may in fact accelerate as companies seek to capture the tax benefits while they are still available. Furthermore, the likes of NextEra Energy⁶ have already safe-harboured equipment for the full four-year term (under tax guidance, if you spend a percentage of the project costs, tax credits can be locked in for up to four years in advance). Over decades of tax credits expiring and being renewed, it has been unprecedented for this safe harbouring to be challenged.
- In future, a different government could of course renew the credits, as has happened before. But more importantly, returns for renewables developers and related-equipment prices are insulated by the boost to power demand due to AI growth (research note [here](#)). Simply put, it is a seller's market for utility-scale power, so the reduction in credits can be more easily passed on to customers via higher prices.

6. No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided. Stock selected to illustrate the investment team's view on the impact of tax credits. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance.

For further information on specific portfolio names, please see the Important information.

The case for a decarbonization allocation

- The sectors most exposed to the removal of tax credits – because the credits make up the majority of profits – are residential solar, US-domiciled solar-equipment companies, and Korean battery manufacturers (Global Environment does not currently have any exposure to these sectors⁷).
- Returns for utilities are largely driven by interest rates, given the huge upfront capital-expenditure costs of developing wind and solar farms. Consequently, we believe the resultant interest-rate environment from President-elect Trump's policies will be a bigger driver of returns for utilities than the expected change in tax credits. The recent moderation in inflation data is supportive, but this continues to be a risk we monitor. Again, greater pricing headroom may mean that renewables developers can better absorb higher interest rate costs.
- In Europe, the policy backdrop for renewables remains supportive.
- China currently makes up the majority of wind and solar growth, and is committed to renewable energy as a new pillar of growth for the economy. Chinese renewables developers are all state-owned enterprises, meaning there is a direct link between government policy and demand for renewables. The scale of the renewables build-out has resulted in hypercompetition, with prices falling to historic lows in the solar industry, reducing profitability of companies in the value chain. However, Chinese government-driven supply-side reform within the battery and solar supply chains should encourage healthier market development. Please see the emerging markets section for more on China.
- Power market reform is the next step on the agenda for China to ensure a smooth functioning system centered around renewables. Several provinces have already begun trial programs, which we view as a strong signal for continued support and progress.

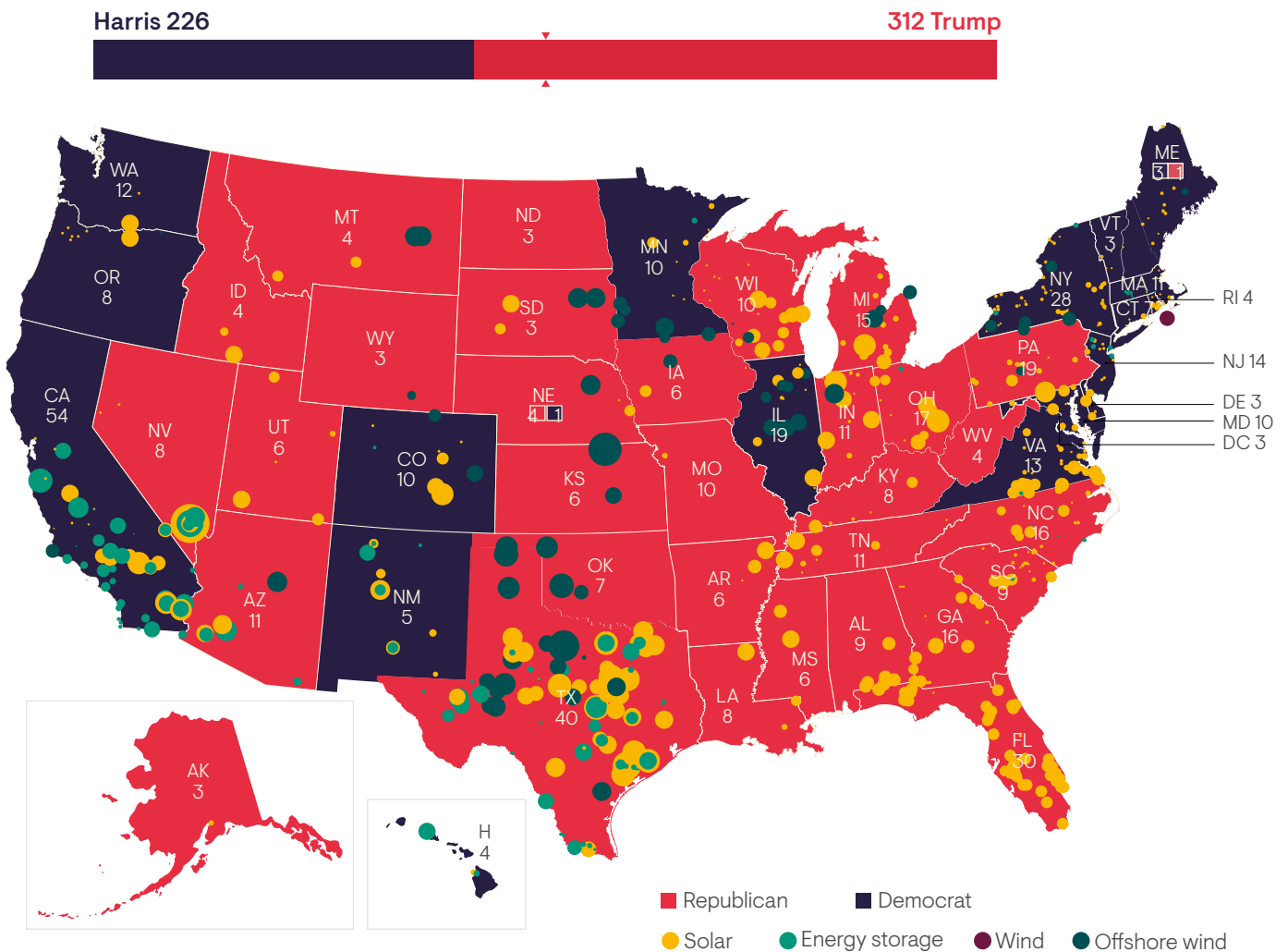
⁷ The portfolio may change significantly over a short space of time.

Technological progress: supportive due to declining renewables costs

- Renewable energy costs have fallen by up to 80% (RMI, 2024) in the past decade. These improving economics have supported huge deployment of wind and solar energy globally. Wright’s law suggests we will continue to see a c.20% decline in costs for every doubling of deployment. Power demand growth from AI is likely to drive additional structural growth for renewable energy, benefitting developers, particularly in an environment of lower price pressure from AI hyperscalers.
- There is a vast supply chain in place to deliver further acceleration in the pace of renewables deployment.

Consumer behavior: n/a

55+GW of clean energy projects in the last 2 years have largely been developed in Republican states



Source: 270towin.com, RMI and Ninety One. As at September 16, 2024.

Company

NextEra Energy

Sector/theme

Utilities/clean power

Structural growth

NextEra Energy is the market leader in owning renewable-generating and battery-storage capacity in the US. We believe it has a key role in delivering the IEA's net-zero roadmap, which requires a doubling of investments to triple renewable capacity by 2030, and hence is extremely well positioned for structural growth. NextEra currently has a record 24GW order backlog and it expects to build-out 33-42GW by 2026, which is c.2x the current operating renewables portfolio. This expected growth is increasing each year. We expect the power demand from datacentres to drive further growth going forward. Additionally, decarbonizing the electricity sector results in excess energy that may be converted into green hydrogen to decarbonize other sectors of the economy.

Competitive advantage

We believe NextEra Energy's market-leading position and first-mover status in developing wind, solar, and battery storage capacity in the US give it several competitive advantages, including access to the best sites (access to interconnection is critical and wind resource especially can vary significantly by location), more competitive turbine pricing (NextEra Energy is one of the largest capital spenders in the US across all industries), better financing terms, and proprietary data. Longer term, we believe the company may be able to capitalize on its market position to benefit from growth of the hydrogen economy. NextEra's distinctive culture appears to deepen the competitive advantage, with a strong employee ownership mindset continuing to drive innovation from the bottom up.

Sustainable returns

NextEra Energy has consistently generated market-leading returns, with an ROE c.2% above the sector average. We expect this trend to continue. We also see the IRA as a potential driver of better longer-term returns.

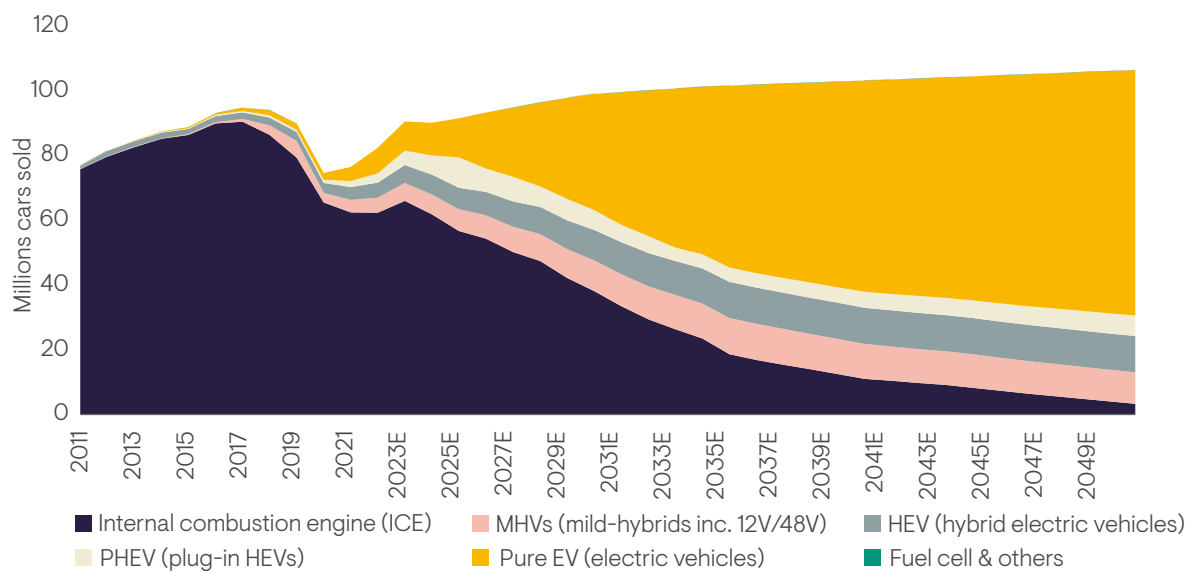
No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided.

Company selected as an example of an investment in the relevant decarbonization pathway. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance. For further information on specific portfolio names, please see the Important information.

Electrification

Upgrading power grids and electrifying the transport system requires vast investment. While we do not expect much headline growth in the total number of cars sold each year, electric vehicles (EVs) will need to make up the majority of cars sold annually to deliver net zero.

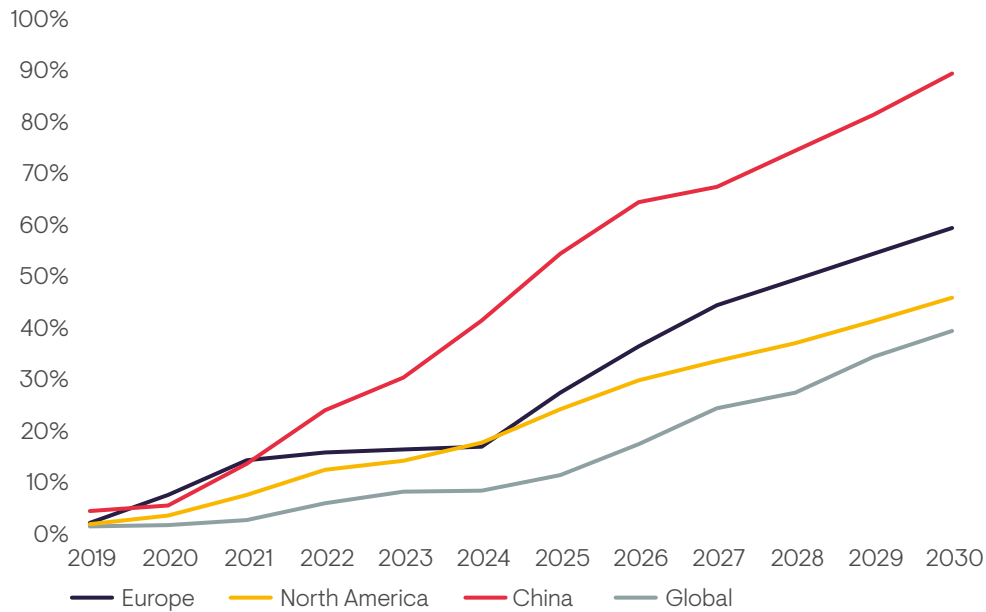
Automotive demand



Source: S&P, CPCA, ACEA, BNEF and Ninety One, 2024

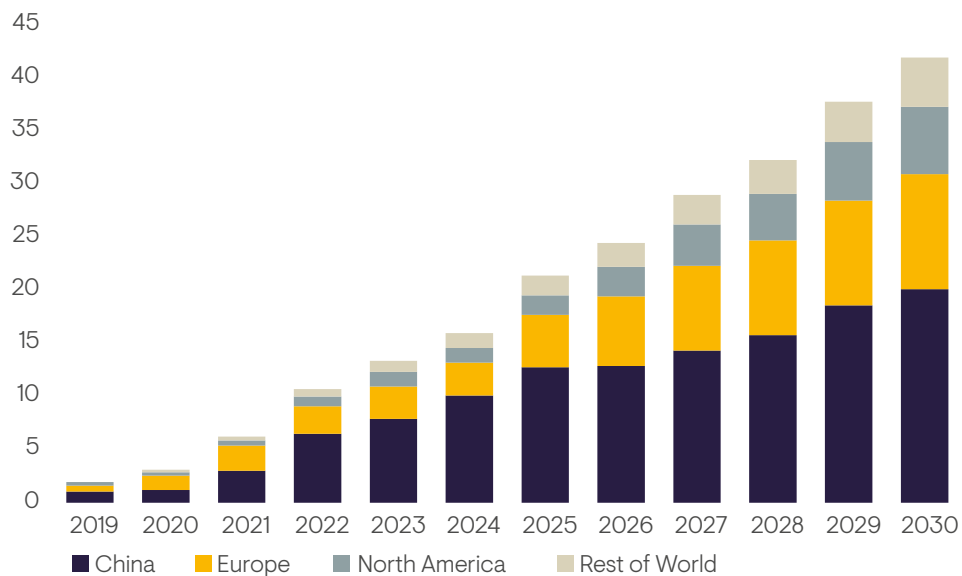
Despite the negative headlines about EVs and the recent slowdown in EV adoption in the US and Europe, EV penetration has increased significantly since 2018. When we launched the Global Environment strategy in 2018, battery EVs (BEV) and plug-in hybrid EVs (PHEV) made up just 2% of annual car sales, at less than 2 million units globally. At the end of 2023, this had increased to a global penetration rate of 15%, with 13 million units sold, almost a 6x increase in five years. We forecast that global EV penetration will reach over 40% by 2030, largely driven by supportive policies in China and Europe, implying 75% and 60% penetration rates, respectively.

BEV and PHEV penetration rates



Source: S&P, CPCA, ACEA, BNEF and Ninety One, 2024.

BEV and PHEV unit growth (millions)



Source: S&P, CPCA, ACEA, BNEF and Ninety One, 2024.

Volume growth and a higher penetration rate in China have in part been driven by greater consumer acceptance, more attractive switching costs, and a better build-out of the infrastructure required to support EVs. For example, there is price parity in China between comparable internal-combustion-engine and EV models, with the best-selling EV in China costing only c.US\$5,000. Consumers can also be confident they can charge their EVs, with more than 1 million chargers installed in China, 51% of the global total (International Council of Clean Transportation, 2024).

The US and EU are on the same journey as China, just much further behind. With the right government policies and technology development within US and EU auto supply chains, we believe both regions could achieve a similar pace of EV growth. According to the IEA, most major car original equipment manufacturers are committing 50-70% of their capital expenditure and R&D budgets to EV and digital technologies.

Investment in power grids to support the electrification of other aspects of our daily lives is also critical, and is closely linked to the renewables build-out. This is a large tailwind for companies involved in the battery value chain, which has seen a c.8x increase in energy storage system (ESS) batteries since 2021. It also supports companies producing the electrical equipment and components that connect wind and solar farms to the grid, convert electricity from DC to AC so that it can be used to power homes and appliances, and optimize the grid to run on renewables. These are all crucial elements of a renewable energy system and we expect the growth trajectories for these sectors to be similar to those of wind and solar installations.

Policy: supportive but at risk in the US

- The longevity of the US\$7,500 tax credit for EV purchases in the US is at risk under a Trump presidency. The removal of this credit would be a headwind to EV growth in the US, as would the removal of the manufacturing credit for EVs and EV batteries. However, Elon Musk's close relationship with Trump calls into question whether the incoming president will completely remove support for EVs, particularly if Musk pushes for the build-out of his robotaxi vision.
- Interest rates affect EV adoption (because they change the cost of car financing), particularly as EVs in the US and Europe are currently more expensive than internal combustion engine counterparts. A declining interest-rate environment would likely be conducive to penetration rates in these regions, and higher rates for longer due to inflation from tariffs and loose fiscal policy would be a headwind in the US.
- We expect EV growth to be underpinned by accelerated European demand in 2025, driven by EU emissions regulation. European policy requires a 20% reduction in tailpipe emissions of each auto manufacturers' fleet by the end of 2025, vs. a 2017 baseline. This requires a material increase in EV sales among European manufacturers, which should result in a supply-side impetus to EV adoption. This is likely negative for auto manufacturers from a profitability perspective, but positive for the supply chain given volume increases.

- Policy is a less important driver in China, with direct purchase subsidies removed in 2022. Hypercompetition in the Chinese EV market has resulted in very low pricing, driving reduced profitability at auto manufacturers. From an investment perspective, we view, the value chain of batteries and other technology products that go into EVs as better industries to get exposure to the rapidly growing Chinese EV market. Please see the emerging markets section for more on China.

Technological progress: supportive as battery technology is rapidly improving and AI is an additional growth driver

- Battery developers are continually pushing the boundaries when it comes to range and charging capabilities. CATL's latest technology can provide 1,000km of range on a single charge, with 600km of charging in 10 minutes. Developments like this should reduce consumer range anxiety and help to support higher EV adoption across all regions.
- Industrial companies providing the components to deliver electrification stand to benefit from technological progress in AI, given that they are critical for the build-out of data centres. The clamour for power has also resulted in surging demand for certain electrical equipment, including high-voltage transformers and switchgear. This has led to some significant shortages, with lead times for some technologies now running to years.

Consumer behavior change: mixed – China is supportive, the US is more challenged

- In China, the evidence suggests increasing consumer preference for EVs; next year, the average penetration of EVs is expected to be 65%. That said, there is growing uptake of PHEVs, as their lower cost appeals to poorer buyers outside of the major cities who have not purchased EVs before, or are not persuaded by BEVs from a range or charging perspective. This has a marginal effect on battery producers, given the lower battery content, but China still provides significant base volume of battery demand.
- Other regions such as Europe are seeing increased consumer interest in EVs, though cost remains a challenge.
- The US is a clear laggard from a consumer-adoption perspective, with current EVs not meeting the preferences of the mass market.

—

No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided.

Company selected as an example of an investment in the relevant decarbonization pathway. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance. For further information on specific portfolio names, please see the Important information.

Company

Contemporary Amperex
Technology (CATL)

Sector/theme

Industrials/electric vehicles

Structural growth

We forecast rapid electrification of transport, with EVs going from 13% of vehicle sales today to c.50% by 2030, driving an increase in EV battery demand from 705GWh in 2023 to more than 3TWh by 2030. The ESS market is growing even faster, from 160GWh in 2023 to more than 1TWh by 2030. At end-2023, CATL reported 1-year revenue growth of 19% and a 5-year CAGR of 63% on a per-share basis.

Competitive advantage

CATL has the largest manufacturing scale globally, at 552GWh at end-2023. This has enabled it to become a cost leader, due to economies of scale and supply-chain pricing power. It also has the highest absolute R&D spending among battery producers globally (US\$2.6bn in 2023), more than its three major South Korean competitors combined. It has a comprehensive battery product portfolio, with global leadership in several key categories, including: lithium ferro phosphate (LFP), a cobalt-free battery with lower cost and better safety; cell-to-pack technology such as the Qilin battery, supporting 1,000km of driving range on a single charge; and emerging battery technologies such as solid-state and semi-solid-state batteries, lithium iron manganese phosphate (LFMP) batteries, and sodium-ion batteries.

Sustainable returns

Despite the asset-heavy business model of battery-cell manufacturing, the competitive advantages above have helped CATL generate a 7-22% ROIC and 11-34% ROE since its listing in 2018. Many of CATL's peers have been loss making most of the time. Its average ROE for the last five years was 19%. It also had >50% share of net profit and as much as 70% share of non-restricted cash in 2023, when most peers were struggling to navigate tough price competition and geopolitical uncertainty.

No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided.

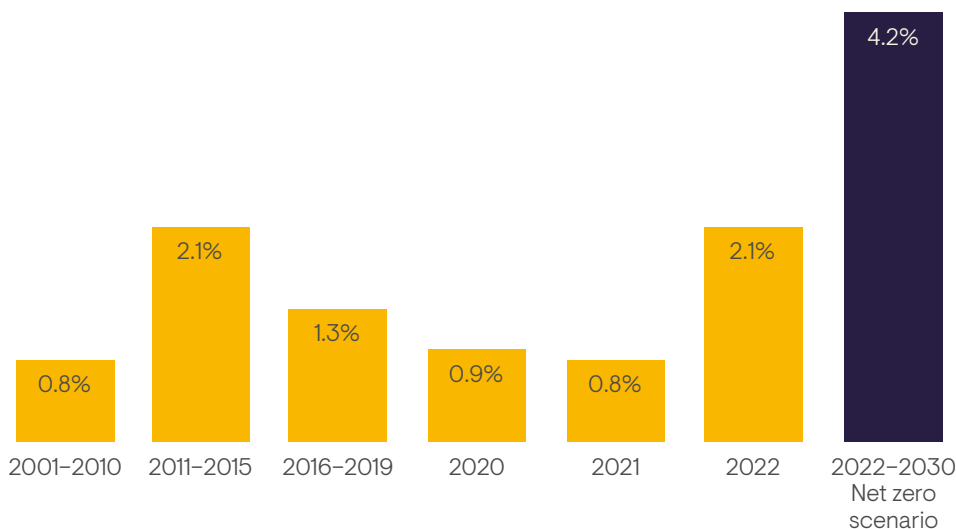
Company selected as an example of an investment in the relevant decarbonization pathway. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance. For further information on specific portfolio names, please see the Important information.

Resource efficiency

Resource efficiency is the broadest of the three segments of the decarbonization opportunity set, spanning diverse technologies. It includes technologies for heating and cooling buildings, decarbonizing food and agriculture, making consumer products less carbon intensive, reducing energy consumed in factories, generating energy (renewable natural gas) from waste, and reducing the use of virgin materials through recycling. As a consequence, the evidence for structural growth in this area is more multi-faceted.

Trends in the energy intensity of the global economy can be useful as a broad gauge. Based on the IEA's recent analysis (summarized in the chart below), energy-efficiency trends are positive, with the rate of improvement accelerating in 2022 after a five-year slowdown.

Global annual primary energy intensity improvement vs. change required in the net-zero scenario



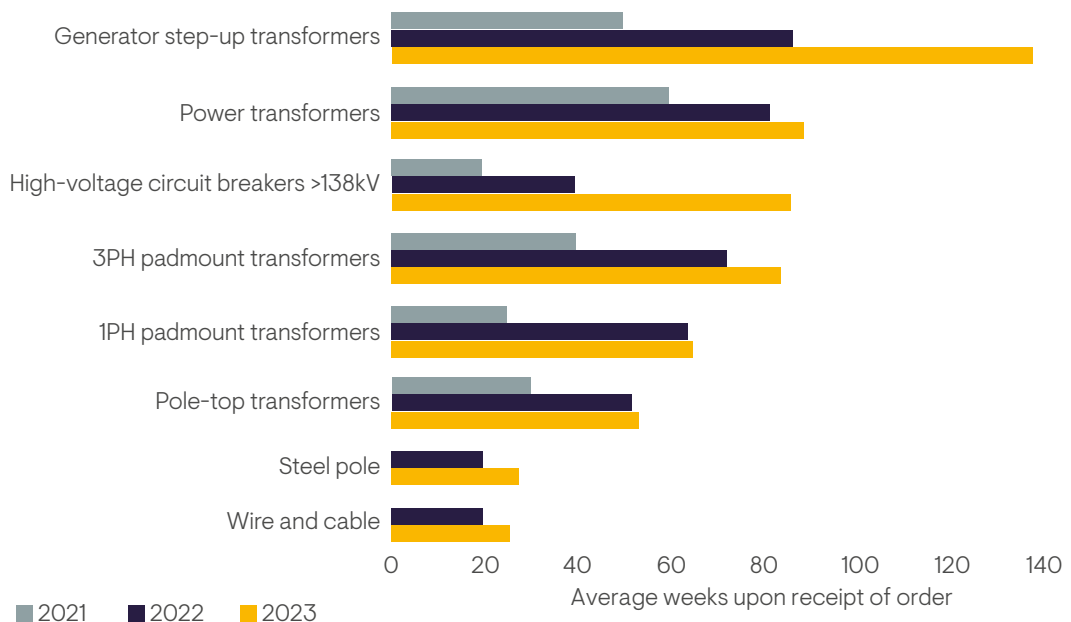
Source: IEA Global Energy Transitions Stocktake, 2023.

The energy crisis of 2022, triggered by Russia's invasion of Ukraine the previous year, was arguably an accelerator for energy efficiency, pushing energy security further up the global agenda, particularly in Europe. Surging inflation was a second-order effect of the conflict, fuelled by supply chain disruption following COVID-19, driving companies to seek energy efficiency gains and reduce input costs. However, the pace of improvement of energy intensity remains far below that required to achieve the world's climate goals.

The case for a decarbonization allocation

AI's energy demand presents additional growth opportunities across the resource-efficiency pathway. The biggest bottleneck for AI datacentres in the short term is not, in fact, electricity generation (the amount of electricity produced over a period of time). Rather, it is electrical power: the maximum capacity in megawatts that a datacentre needs available to be able to operate. A typical co-location datacentre needs 20-30MW, but a dedicated AI campus might need 100-500MW. Gartner estimates that, by 2027, 40% of existing AI datacentres will be restricted by power availability. We see an opportunity for companies that provide technologies and services that are crucial to solving this power (as opposed to generation) challenge. The clamour for power has also resulted in surging demand for certain electrical equipment, including high-voltage transformers and switchgear. This has led to some significant shortages, with lead times for some technologies now running to years (see chart).

Average lead times for critical equipment



Source: Wood Mackenzie, 2024.

Alongside the need to ramp up power availability to scale up AI, there is a heightened focus on improving datacentre efficiency, specifically server and infrastructure efficiency. Companies that deliver decarbonization by supplying thermal-management solutions and custom application-specific chips specialised for AI processing tasks should stand to benefit.

Investment opportunity and outlook

A broad range of industries stand to benefit from the increasing demand for resource efficiency solutions, some of which are outlined below.

Simulation technology

Adoption of simulation software is increasing in the construction and engineering industries. Ansys, a technology company that develops simulation software for engineering and other applications, has estimated that the core simulation market will double in size to c.US\$16 billion in the next decade and expects this growth to accelerate as new use-cases for simulation technology emerge.

Heating, ventilation and air conditioning

As global temperatures rise, demand for cooling systems is projected to increase dramatically (see chart), with cooling expected to become the fastest-growing use of energy in buildings. More efficient HVAC (heating, ventilation and air conditioning) systems are essential, with the IEA calculating that the most efficient cooling units in some markets are twice as efficient as the average unit sold, often at comparable prices.

Infrastructure consulting

There is a wide and growing addressable market for infrastructure consulting firms that specialise in sustainability, driven by increasing climate financing flows, water infrastructure spending, pollution remediation budgets, and rising infrastructure spending generally. This provides a low-risk, high-margin opportunity set of specialist professional services firms that provide capital-light access to growth from decarbonization.

Semiconductors and electrical equipment

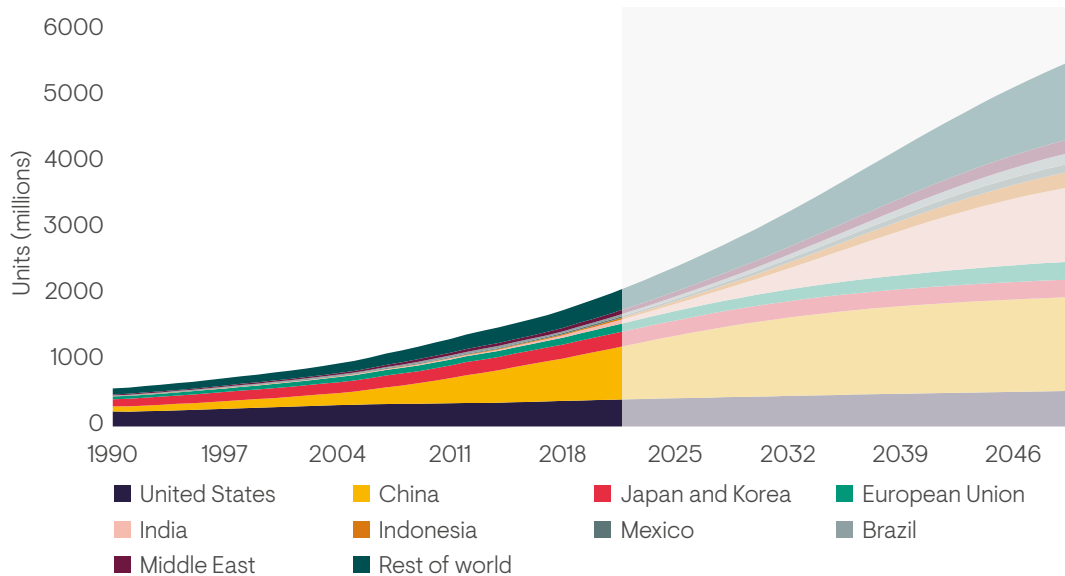
As the economy adjusts to power the AI revolution, a range of energy-efficiency solutions will be required to develop the most power-efficient chips and data centres. Beneficiaries are those developing leading-edge GPU semiconductors, application-specific semiconductors, backside power delivery, power equipment, and data centre cooling.

No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided.

Company selected as an example of an investment in the relevant decarbonization pathway. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance. For further information on specific portfolio names, please see the Important information.

The types of technology referenced above enable businesses to reduce inputs and therefore costs, incentivizing their take up. We see companies involved in developing these solutions continue to innovate to drive further efficiency gains, making their products and services increasingly attractive in an environment of volatile input costs and higher inflation.

Historic and projected global air conditioner stock from 1990–2050



Source: IEA The Future of Colling – Opportunities for energy air conditioning.

Policy: supportive in developed markets

- In the US, state-level buildings regulation is incrementally mandating more energy-efficient materials and roofing; 29 states now enforce the 2015 International Building Code (or newer iterations), which has led to a big step-up in minimum insulation requirements.
- Similar trends towards more stringent efficiency regulations can be seen in the UK and Europe across businesses, industry, and homes. The EU released a revised Energy Efficiency Directive in 2023, significantly raising the EU’s ambition on energy efficiency. The revised directive more than doubles the annual energy savings obligation by 2028.
- The revised EU directive outlined above introduces an obligation for the monitoring and reporting of the energy performance of data centres, with the US likely to move towards reporting and efficiency requirements in the future.

Technological progress: supportive, with AI as a growth driver

- The ramp-up in power demand for AI has put a heightened focus on improving datacentre efficiency, specifically server and infrastructure efficiency. In turn, that is driving a structural increase in demand for a wide range of energy-efficiency solutions across semiconductors and electrical equipment.
- Improvement in datacentre efficiency has flatlined in recent years on average. But some large tech companies, most notably Google, have continued to find efficiency gains, highlighting that such gains are possible, and we expect others to now follow suit.
- In-demand technologies here are diverse, and include more efficient semiconductors, power equipment such as switchgear and transformers, and solutions that enable more efficient datacentre cooling. Demand pressures are already evident in these markets, with lead times for some technologies extending significantly.

Consumer behavior change: mixed, but less important

- For consumers, cost-of-living concerns have taken precedence over climate consciousness in the past couple of years.
- However, this also means there is consumer demand for more efficient, and therefore cost-effective, domestic appliances and methods for heating and cooling homes.

Company

Schneider Electric

Sector/theme

Industrials/electric vehicles

Structural growth

The electrification of fossil-fuel processes supports demand for Schneider Electric's low- and medium-voltage products, given that many more electrical appliances need to be connected to progress towards net zero. Sales of many products from the company's energy-management segment are driven by the need for better energy efficiency, particularly in Schneider's key end-markets such as data centres, buildings, and utilities. This should help Schneider Electric meet its target of 80% of revenues from green solutions by 2025. With a significant installed base worldwide, Schneider Electric can focus on growing its software and service businesses.

Competitive advantage

Continued innovation and a high-quality offering have enabled Schneider Electric to maintain a sizeable market share across many parts of its energy-management segment. The company also has a large global distribution channel, which has been key to the success of its low-voltage products (it is the global #1 in this segment). A 'multi-hub' operating model puts a strong focus on building local teams, which allows for more efficient decision-making. Other advantages include the mission-critical nature of Schneider Electric's products and services, and the company's strong brand and reputation for reliability. Schneider Electric also benefits from cross-selling opportunities across energy management and industrial automation, and from having the most complete offering among its peers. The firm has a distinctive culture relative to peers, reflecting its decentralized business structure and decision to give autonomy to employees when interacting with customers. This bolsters nimbleness and drives robust employee engagement and motivation.

Sustainable returns

In addition to innovation and product/service quality, positioning around mega-trends has helped Schneider Electric build significant market share in most of its business lines. The company has expanded its margins over the past few years and shown strong pricing power. We believe this can continue over the medium term thanks to Schneider Electric's leadership, focus on cost control, and growth in higher-margin segments such as software and services.

No representation is being made that any investment will or is likely to achieve profits or losses similar to those achieved in the past, or that significant losses will be avoided.

Company selected as an example of an investment in the relevant decarbonization pathway. This is not a buy, sell or hold recommendation for any particular security. To evaluate the outcome of the strategy, see long-term performance. For further information on specific portfolio names, please see the Important information.

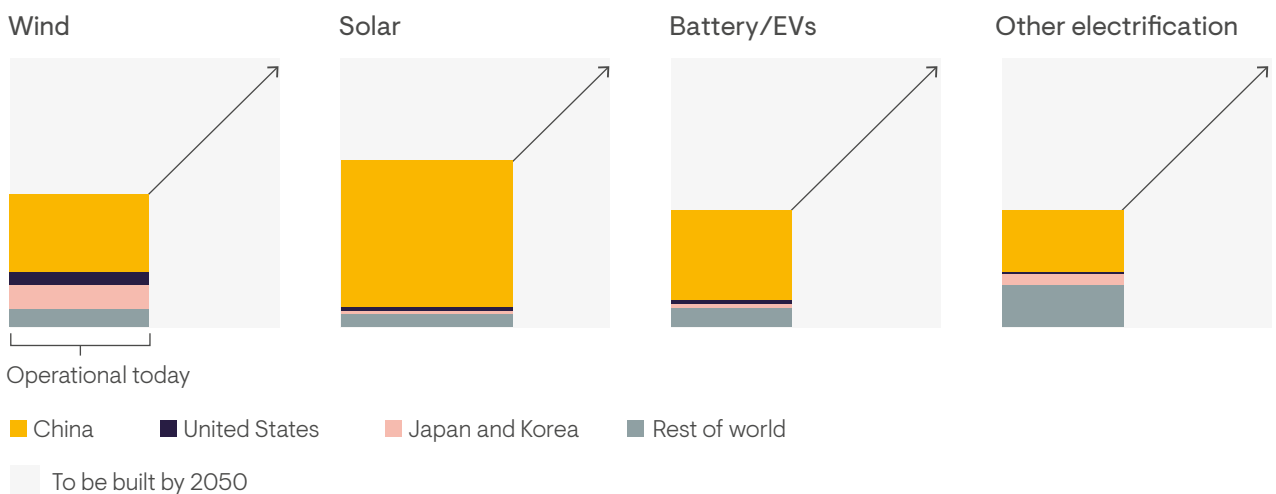
Emerging markets' central role in decarbonization

To understand the decarbonization opportunity set, it is helpful to also take a regional perspective, in particular to consider emerging markets – and especially China – which some investors from advanced economies overlook.

China alone now accounts for more than 30% of global emissions, twice the share of the US. But as well as being the largest emitter globally, China is home to many of the most innovative companies in low-carbon technologies and it dominates production in several clean-technology markets. Chinese businesses represent c.35% of our decarbonization universe, which is broadly similar to the proportion of decarbonization-related patents related to Chinese companies globally. Within the solar industry, for example, China produces 70-90% of solar components production. As a consequence, the scale advantages of Chinese firms are almost impossible to replicate in other markets.

Clean-tech share of production capacity by region

Share of total production capacity by region today vs. total final market size in zero-carbon economy



Source: Energy Institute, IEA EV outlook 2023, IEA World Energy Balance, BNEF Energy Transition Investment Trends, IEA World Energy Outlook (WEO) 2022.

China's massive investment into clean technology is ultimately a positive for the global transition to net zero. But there have been some negative effects of this state support, which has resulted in excess capacity within parts of the EV and solar industries. There are now a large number of sub-scale EV manufacturers competing on price for market share. In the solar market, year-on-year export-volume growth is significant, but the total value of solar exports has actually declined. The Chinese government has indicated that this level of price competition is unsustainable and might bring forward supply-side reform policies similar to the measures put on the steel, cement, and glass industries in the early 2010s.

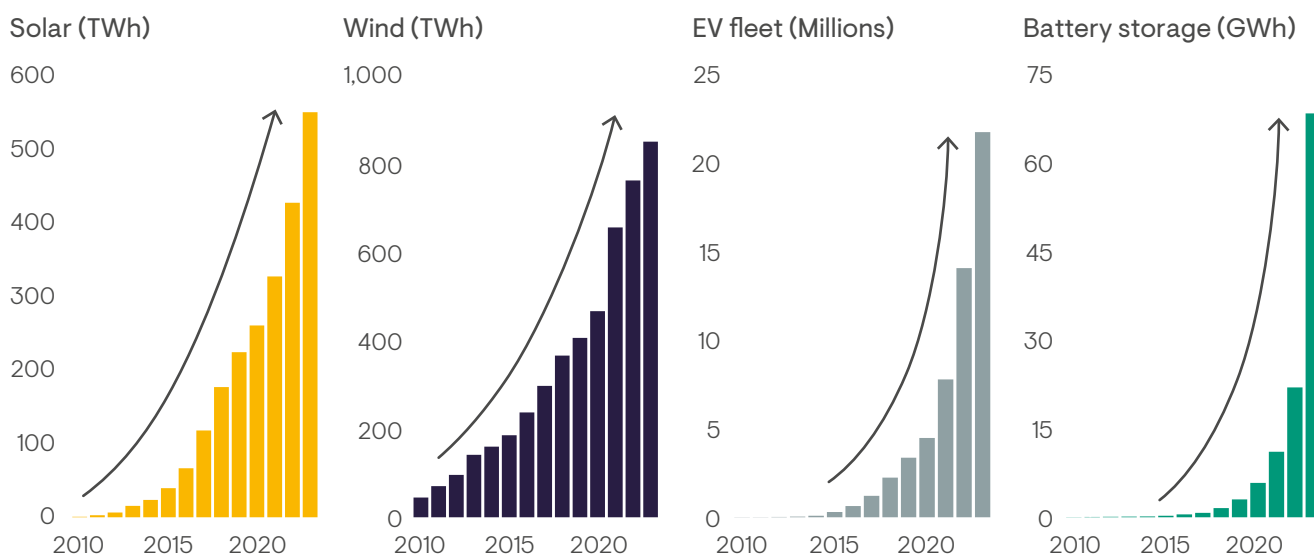
The case for a decarbonization allocation

In the meantime, we think the oversupply issues are more concentrated in certain sub industries. For example, we have avoided investing in the EV-manufacturer and solar-module manufacturer sub-segments of these industries, preferring to own leaders in the battery and solar value chains that we think are less exposed to hyper-competition, or are delivering differentiated products that will enable them to outcompete without needing to drop prices to loss-making levels. In general, companies with weaker businesses and commoditized products will struggle, and we can expect a shake-out in Chinese clean-tech industries.

In addition, heightened geopolitical and regulatory risks regarding China underline the importance of in-depth fundamental analysis and high selectivity when investing in the region. Considering their potential impacts on a company is an important part of our investment process, as is understanding the company's natural, social, and human capital externalities and its corporate governance. Ultimately, we will not invest in a company if we are not comfortable with it from a broader sustainability and ESG perspective, even if it otherwise meets the criteria for the portfolio.

From an investment perspective, we continue to view China as too important to ignore, given the growth in decarbonization-linked parts of the Chinese economy. In a decade, solar generation increased by 35x and wind by 9x. EVs and batteries scaled even faster. This has resulted in China contributing 60% of global EV sales, and 56% of solar and 60% of wind installation, and the government has ambitious plans to further develop these sectors as it transitions to the 'new' economy, built on the pillars of clean technology and other high-tech manufacturing industries.

Clean technology growth in China



Source: IEA, BNEF, RMI, 2024.

The case for a decarbonization allocation

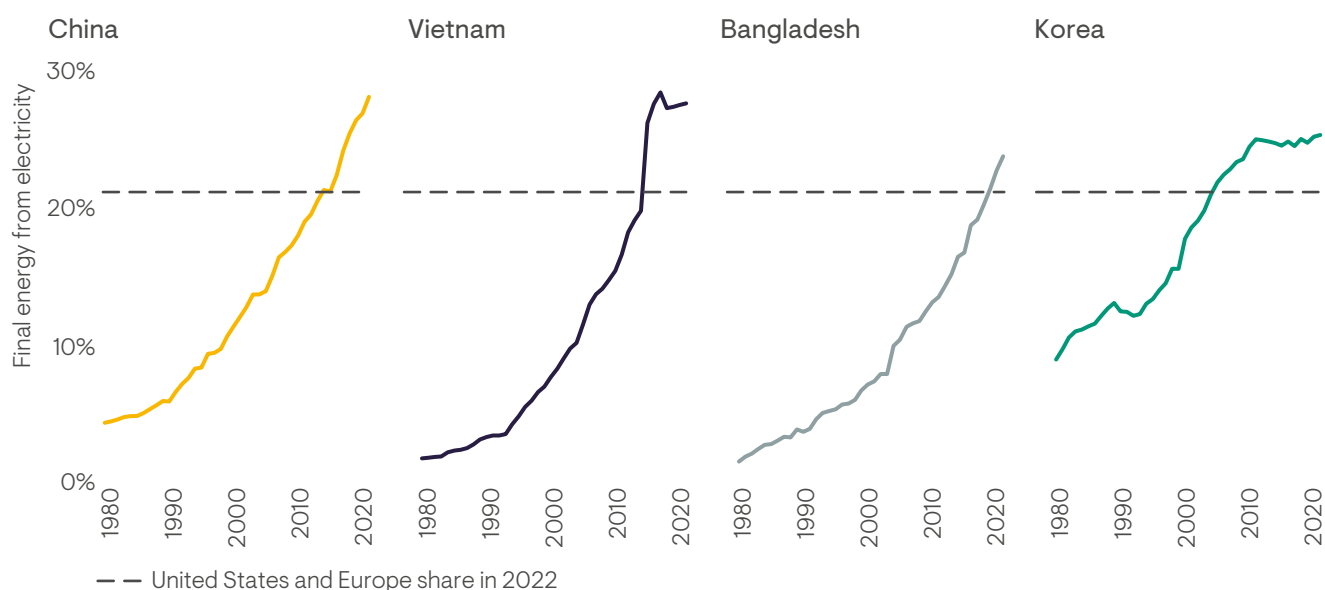
China is not the only driver of global decarbonization within emerging markets. The adoption of clean technology is growing rapidly in other countries, with renewable energy in India growing at a faster rate than anywhere else in the world, and Asia generally leading the charge towards electrification. As well as being a strong and growing source of demand for decarbonization solutions, the rapid growth of clean-tech sectors in emerging markets creates a fertile backdrop for clean-tech innovation.

Growth of decarbonization industries in emerging markets is also having widespread social effects. For example, China's immense surge in solar capacity is making solar electricity affordable in even the poorest societies. A 13GW increase in exports of cheap solar to Pakistan is enabling that country to begin transforming its power grid. And, of course, it ultimately benefits the developed world: with emerging markets accounting for the vast majority of global emissions growth, there will be no net zero without decarbonization in the developing world.

For all of these reasons, we view investments in emerging markets as an essential component of a decarbonization allocation.

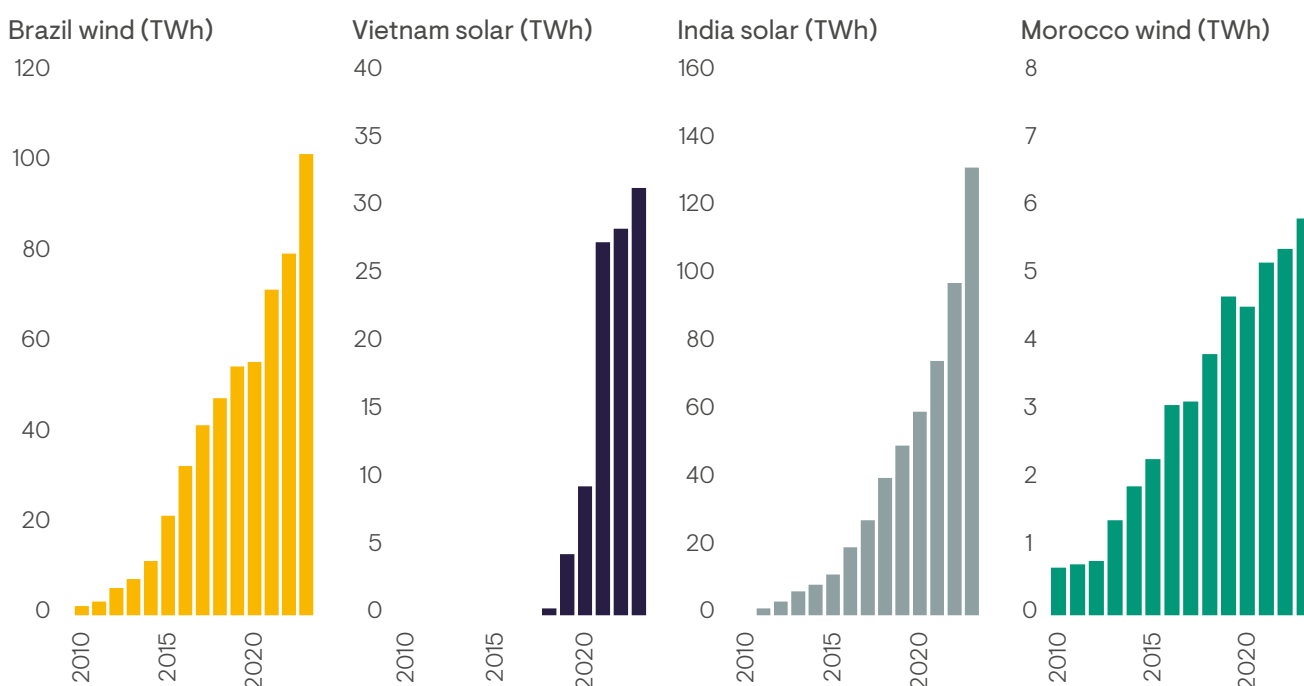
From a nearer-term perspective, the risk of higher tariffs on Chinese imports under a Trump presidency poses a challenge for Chinese stocks with large US exposure (within our portfolio, the investment case for our current Chinese holdings focuses on domestic growth, and they have limited direct exposure to the US). Chinese domestic policy is becoming increasingly supportive for growth generally in China, following monetary and fiscal loosening over the past couple of months, which would benefit decarbonization sectors.

Percentage of final energy from electricity



Source: IEA, BNEF, RMI, 2024.

Wind and solar generating capacity in select emerging markets



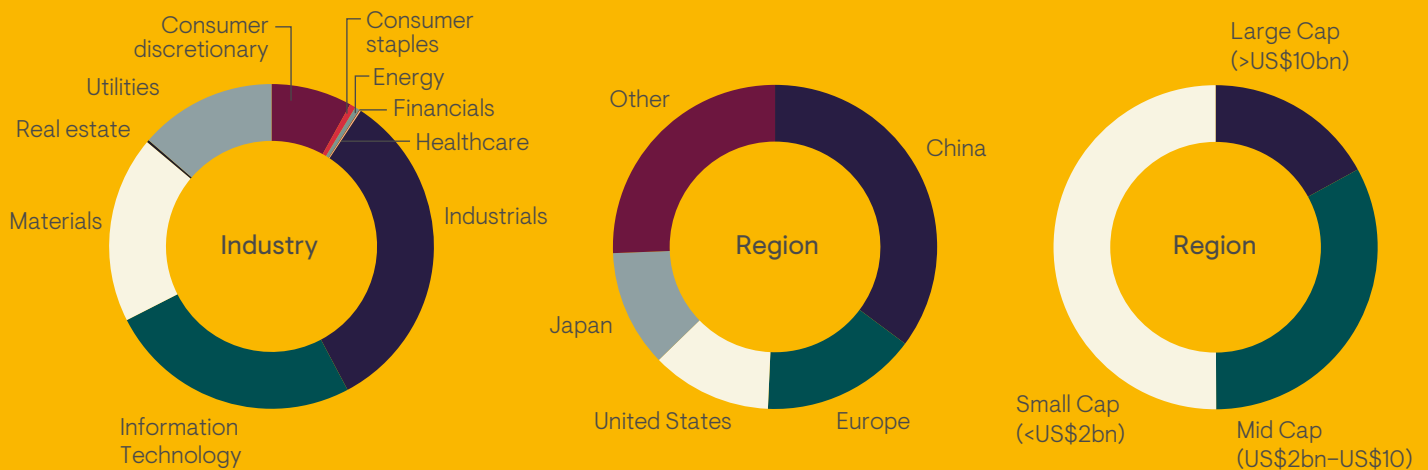
Source: RMI, July 2024.

General risks. The value of investments, and any income generated from them, can fall as well as rise. Where charges are taken from capital, this may constrain future growth. Past performance is not a reliable indicator of future results. If any currency differs from the investor's home currency, returns may increase or decrease as a result of currency fluctuations. Investment objectives and performance targets are subject to change and may not necessarily be achieved, losses may be made. Environmental, social or governance related risk events or factors, if they occur, could cause a negative impact on the value of investments.

Specific risks. **Currency exchange:** Changes in the relative values of different currencies may adversely affect the value of investments and any related income. **Derivatives:** The use of derivatives is not intended to increase the overall level of risk. However, the use of derivatives may still lead to large changes in value and includes the potential for large financial loss. A counterparty to a derivative transaction may fail to meet its obligations which may also lead to a financial loss. **Equity investment:** The value of equities (e.g. shares) and equity-related investments may vary according to company profits and future prospects as well as more general market factors. In the event of a company default (e.g. insolvency), the owners of their equity rank last in terms of any financial payment from that company. **Concentrated portfolio:** The portfolio invests in a relatively small number of individual holdings. This may mean wider fluctuations in value than more broadly invested portfolios. **Emerging market (inc. China):** These markets carry a higher risk of financial loss than more developed markets as they may have less developed legal, political, economic or other systems. **Sustainable Strategies:** Sustainable, impact or other sustainability-focused portfolios consider specific factors related to their strategies in assessing and selecting investments. As a result, they will exclude certain industries and companies that do not meet their criteria. This may result in their portfolios being substantially different from broader benchmarks or investment universes, which could in turn result in relative investment performance deviating significantly from the performance of the broader market.

4 Understanding the investment opportunities within the decarbonization universe

Our proprietary universe of decarbonization equities (we refer to it as the carbon avoided universe, as all of the companies in it contribute carbon avoided) comprises 1,700 companies with a combined market capitalization of US\$18 trillion. Yet despite its size and diversity (see pie charts) it has limited overlap with the MSCI ACWI broad global equity index: only 28% of the companies in the carbon avoided universe are also in the MSCI ACWI, and together they account for just 18% of the weight of the global equity benchmark.

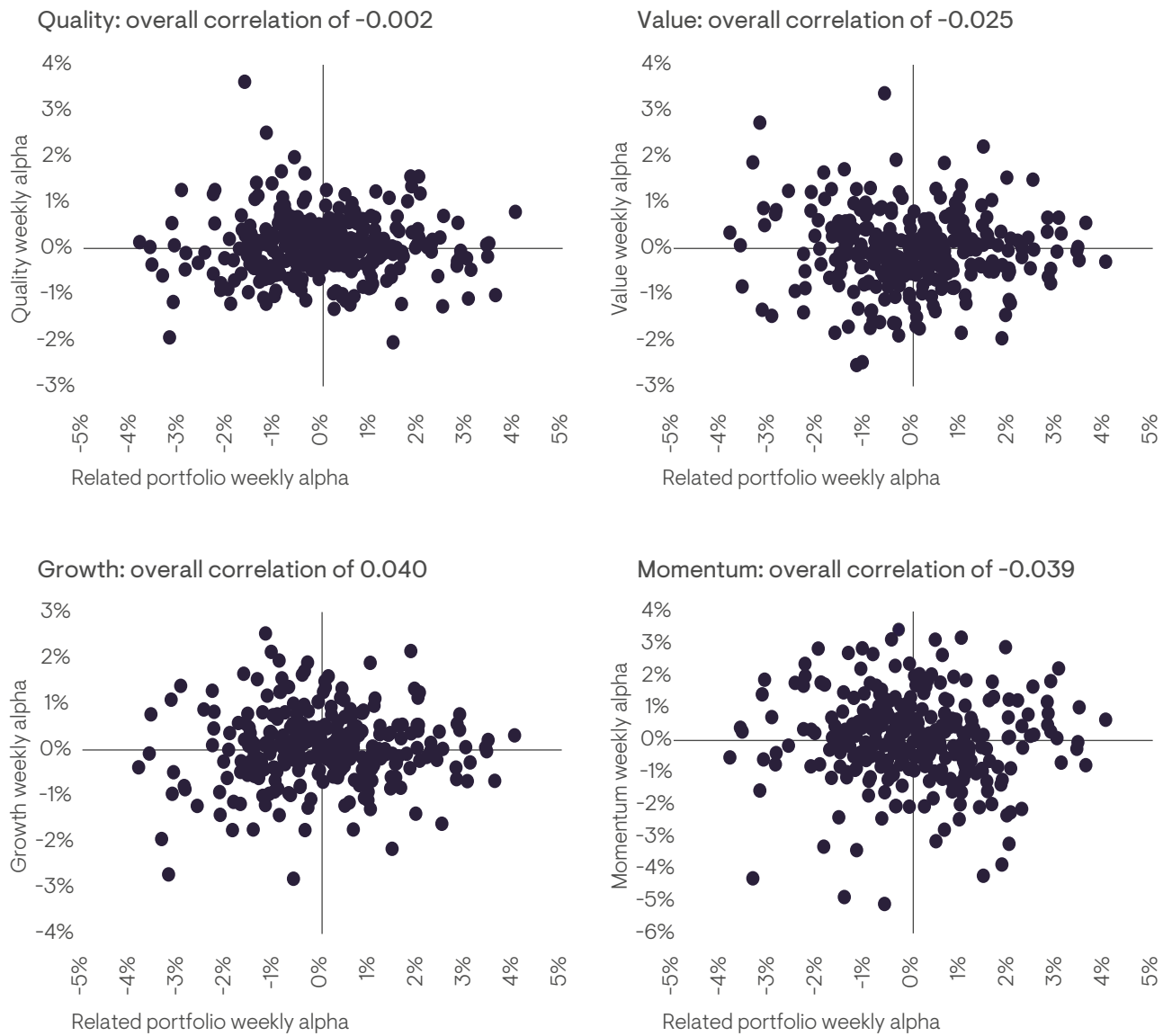


Source: Ninety One, March 2024.

The Global Environment portfolio is highly selective, comprising c.25 companies from the carbon avoided universe. Given the concentrated nature of the investment approach and the differentiated exposures of the carbon avoided universe, the result has been a portfolio with historically low correlations to global equities, and which we believe can complement other equity allocations.

The following charts plot Global Environment’s monthly returns against the monthly returns of MSCI’s Quality, Value, Growth, and Momentum indices since inception in September 2018. The absence of a pattern in the dots indicates Global Environment’s differentiated return profile versus each of the indices. This is reinforced by the low correlations in each instance (whether positive or negative).

Global Environment's monthly returns



Past performance does not predict future returns, losses may be made.

Source: Ninety One, Bloomberg, November 2024. Uses weekly data from September 1 2018 onwards, MSCI ACWI Quality, MSCI ACWI Value, MSCI ACWI Growth and MSCI ACWI Momentum used for the respective charts. "Alpha" is defined as excess returns relative to MSCI ACWI. Based on a related portfolio with substantially similar objectives as those of the services being offered. Assumes a management fee of 0.85% p.a.

5 Summary

- We believe a decarbonization allocation can complement a core global equity portfolio, bringing diversification benefits and offering the potential for uncorrelated returns.
- The decarbonization equity universe offers exposure to parts of the global economy that are experiencing structural growth, which we expect to persist through economic cycles for decades. The amount of capital deployed into decarbonization solutions has grown rapidly, but it needs to increase significantly faster to deliver on global net-zero commitments.
- Capital flows into decarbonization have translated into a growing market for decarbonization products and services, generating a very substantial revenue pool that would increase significantly under a net-zero scenario. The momentum behind decarbonization remains broadly positive:
 - Policy is on the whole supportive for decarbonization, and we believe will continue to accelerate growth of clean technologies. However, there are risks to the policy outlook, particularly in the US where higher tariffs could slow the pace of transition.
 - Technological progress has meant that renewable energy sources are now often cheaper than fossil fuels, supporting their continued adoption globally. The development of AI is a new growth driver for decarbonization technology, as abundant clean and efficient energy is essential to facilitate AI growth in line with the net-zero commitments made by AI hyperscalers.
 - Consumer behavior has emphasised cost-of-living concerns over climate and sustainability in recent years, which has likely been a headwind to growth in certain areas (EVs in Europe and the US for example). As inflation recedes and technology innovation results in more compelling new products, this may dissipate.
- We view emerging markets as a compelling opportunity for investors in decarbonization, particularly given the pace of electrification, innovation, and adoption of clean technologies in these countries.
- The decarbonization equity universe has limited overlap with global equities. The Global Environment portfolio has historically displayed low correlation with MSCI indices for value, quality, growth, and momentum.

Australia

Level 28 Suite 3, Chifley Tower
2 Chifley Square
Sydney, NSW 2000
Telephone: +61 2 9160 8400
australia@ninetyone.com

Botswana

Plot 64289, First floor
Tlokweg Road, Fairgrounds
Gaborone
PO Box 49
Botswana
Telephone: +267 318 0112
botswanaclientservice@ninetyone.com

Channel Islands

PO Box 250, St Peter Port
Guernsey, GY1 3QH
Telephone: +44 (0)1481 710 404
enquiries@ninetyone.com

Germany

Bockenheimer Landstraße 23
60325 Frankfurt am Main
Telephone: +49 (0)69 7158 5900
deutschland@ninetyone.com

Hong Kong

Suites 1201-1206, 12/F
One Pacific Place
88 Queensway, Admiralty
Telephone: +852 2861 6888
hongkong@ninetyone.com

Luxembourg

2-4, Avenue Marie-Thérèse
L-2132 Luxembourg
Telephone: +352 28 12 77 20
enquiries@ninetyone.com

Namibia

Am Weinberg Estate
Winterhoek Building
1st Floor, West Office
13 Jan Jonker Avenue
Windhoek
Telephone: +264 (61) 389 500
namibia@ninetyone.com

Netherlands

Johan de Wittlaan 7
2517 JR Den Haag
Netherlands
Telephone: +31 70 701 3652
enquiries@ninetyone.com

Singapore

138 Market Street
CapitaGreen #27-02
Singapore 048946
Telephone: +65 6653 5550
singapore@ninetyone.com

—

www.ninetyone.com

Telephone calls may be recorded for training, monitoring and regulatory purposes and to confirm investors' instructions.

For more details please visit www.ninetyone.com/contactus

South Africa

36 Hans Strijdom Avenue
Foreshore, Cape Town 8001
Telephone: +27 (0)21 901 1000
enquiries@ninetyone.com

Sweden

Västra Trädgårdsgatan 15,
111 53 Stockholm
Telephone: +46 8 502 438 20
enquiries@ninetyone.com

Switzerland

Dufourstrasse 49
8008 Zurich
Telephone: +41 44 262 00 44
enquiries@ninetyone.com

United Kingdom

55 Gresham Street
London, EC2V 7EL
Telephone: +44 (0)20 3938 1900
enquiries@ninetyone.com

United States

Park Avenue Tower, 65 East 55th Street
New York, 10022
US Toll Free: +1 800 434 5623
usa@ninetyone.com

Important information

This communication is for professional investors and financial advisors only. It is not to be distributed to the public or within a country where such distribution would be contrary to applicable law or regulations.

The information may discuss general market activity or industry trends and is not intended to be relied upon as a forecast, research or investment advice. The economic and market views presented herein reflect Ninety One's judgment as at the date shown and are subject to change without notice. There is no guarantee that views and opinions expressed will be correct and may not reflect those of Ninety One as a whole, different views may be expressed based on different investment objectives. Although we believe any information obtained from external sources to be reliable, we have not independently verified it, and we cannot guarantee its accuracy or completeness (ESG-related data is still at an early stage with considerable variation in estimates and disclosure across companies. Double counting is inherent in all aggregate carbon data). Ninety One's internal data may not be audited. Ninety One does not provide legal or tax advice. Prospective investors should consult their tax advisors before making tax-related investment decisions.

Nothing herein should be construed as an offer to enter into any contract, investment advice, a recommendation of any kind, a solicitation of clients, or an offer to invest in any particular fund, product, investment vehicle or derivative. Investment involves risks. Past performance is not indicative of future performance. Any decision to invest in strategies described herein should be made after reviewing the offering document and conducting such investigation as an investor deems necessary and consulting its own legal, accounting and tax advisors in order to make an independent determination of suitability and consequences of such an investment. This material does not purport to be a complete summary of all the risks associated with this Strategy. A description of risks associated with this Strategy can be found in the offering or other disclosure documents. Copies of such documents are available free of charge upon request.

In the US, this communication should only be read by Institutional Investors (Accredited Investors and Qualified Purchasers), Financial Advisors (FINRA-registered Broker Dealers) and, at their exclusive discretion, their eligible clients. It must not be distributed to US Persons apart from the aforementioned recipients. THIS INVESTMENT IS NOT FOR SALE TO US PERSONS EXCEPT ACCREDITED INVESTORS AND QUALIFIED PURCHASERS. Note that returns will be reduced by management fees and that investment advisory fees can be found in Form ADV Part 2A.

Except as otherwise authorised, this information may not be shown, copied, transmitted, or otherwise given to any third party without Ninety One's prior written consent. © 2024 Ninety One. All rights reserved. Issued by Ninety One, November 2024.

Additional information on our investment strategies can be provided on request.

Investment Process

Any description or information regarding investment process is provided for illustrative purposes only, may not be fully indicative of any present or future investments and may be changed at the discretion of the manager without notice. References to specific investments, strategies or investment vehicles are for illustrative purposes only and should not be relied upon as a recommendation to purchase or sell such investments or to engage in any particular Strategy. Portfolio data is expected to change and there is no assurance that the actual portfolio will remain as described herein. There is no assurance that the investments presented will be available in the future at the levels presented, with the same characteristics or be available at all. Past performance is no guarantee of future results and has no bearing upon the ability of Manager to construct the illustrative portfolio and implement its investment strategy or investment objective.

Specific Portfolio Names

References to particular investments or strategies are for illustrative purposes only and should not be seen as a buy, sell or hold recommendation. Such references are not a complete list and other positions, strategies, or vehicles may experience results which differ, perhaps materially, from those presented herein due to different investment objectives, guidelines or market conditions. The securities or investment products mentioned in this document may not have been registered in any jurisdiction. More information is available upon request.

Indices

Indices are shown for illustrative purposes only, are unmanaged and do not take into account market conditions or the costs associated with investing. Further, the manager's strategy may deploy investment techniques and instruments not used to generate Index performance. For this reason, the performance of the manager and the Indices are not directly comparable. MSCI data is sourced from MSCI Inc. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, endorsed, reviewed or produced by MSCI. None of the MSCI data is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. FTSE data is sourced from FTSE International Limited ('FTSE') © FTSE 2024 Please note a disclaimer applies to FTSE data and can be found at www.ftse.com/products/downloads/FTSE_Wholly_Owned_Non-Partner.pdf.

