Two decades of sustainable equity investing

NN investment partners

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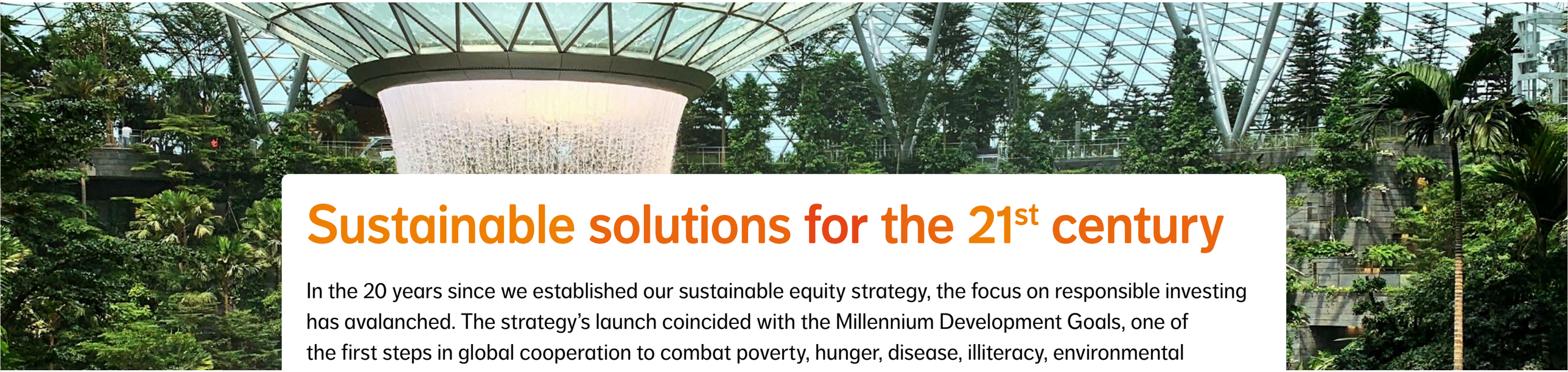


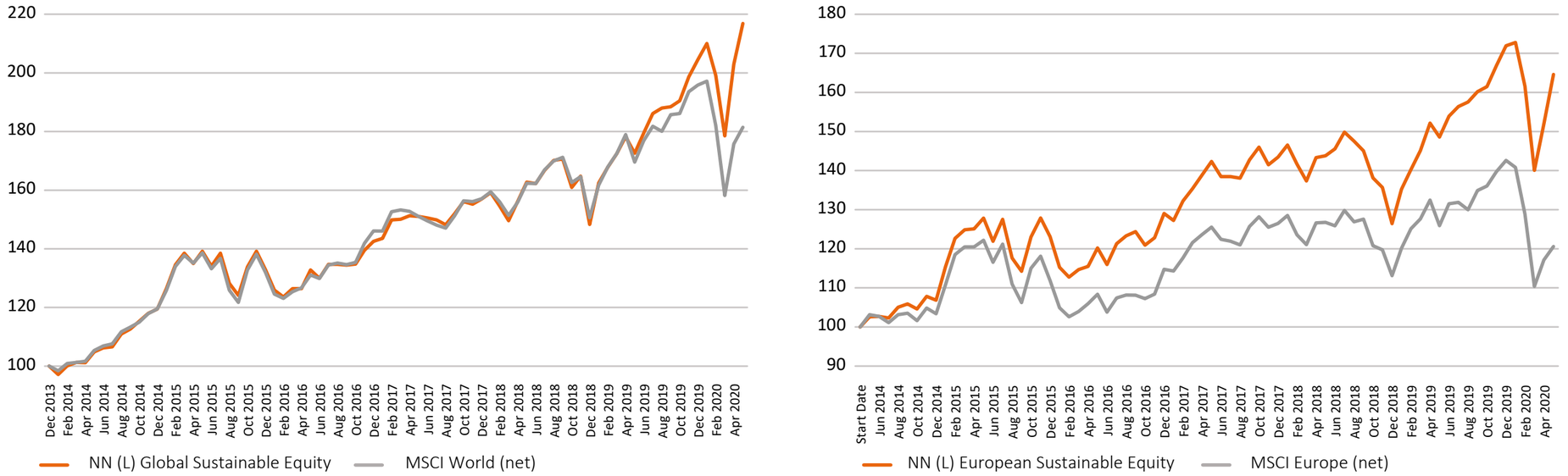
Sustainable solutions for the 21st century

In the 20 years since we established our sustainable equity strategy, the focus on responsible investing has avalanched. The strategy's launch coincided with the Millennium Development Goals, one of the first steps in global cooperation to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. The UN-endorsed Principles for Responsible Investing (PRI), the Paris Agreement and the introduction of the UN's 17 Sustainable Development Goals (SDGs) are just three of the milestones that followed in the last two decades and that have helped propel responsible investing from niche to mainstream.

Consistent performance throughout the full market cycle

Our sustainable equity capabilities have kept pace with these developments. We now manage EUR 7.3 billion in our European and Global sustainable equity variants. The strategy has proved its worth at every stage of the market cycle. Its quality approach and focus on asset-light, sustainable and forward-looking businesses have enabled it to effectively withstand major market shocks. It proved resilient during the financial crisis in 2008 and also held up well in the first quarter of 2020, outperforming its traditional counterparts, as the impact of the coronavirus hit markets. Both the European and Global variants of the strategy have track records of outperformance in both up and down markets, beating their benchmarks over the past 1-, 3-, and 5-year periods (see Figure 1).

Figure 1: Performance history for Global Sustainable Equity and European Sustainable Equity strategies

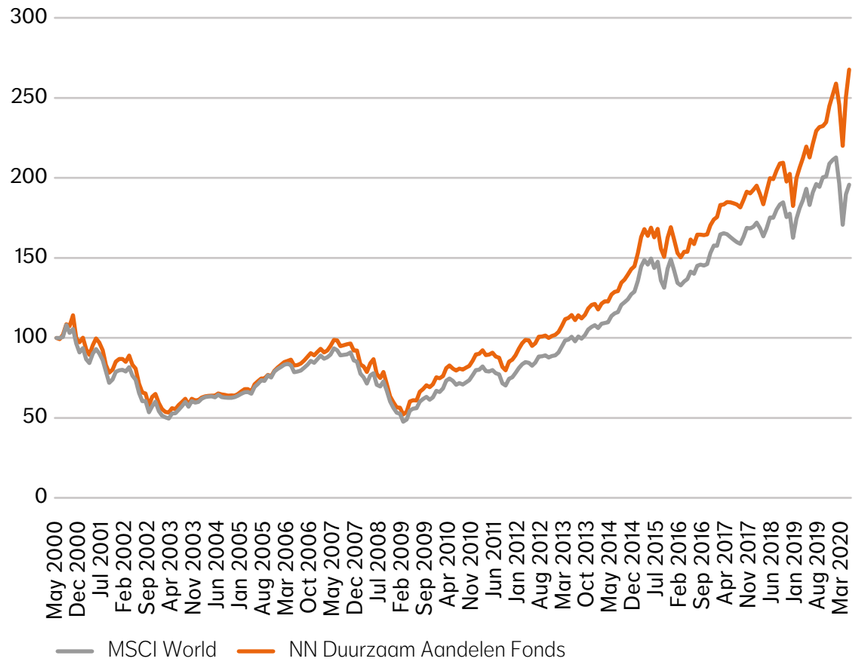


Source: NN IP Performance Measurement. Returns are indexed from start 2014 (from inception in April 2014 for the European fund) until end of May 2020 and presented in EUR after all transaction costs, but before management fees. Returns include the reinvestment of income. Past performance is no guarantee of future results and the possibility of loss does exist.

The strategy also has a solid performance record over its entire 20-year history. It has generated 1.4% annualised outperformance since its inception in May 2000. Figure 2 depicts the track record since inception of the original Dutch vehicle; this comprehensive overview demonstrates the strategy's consistency throughout the market cycle.

Despite its consistent performance, in the early years the strategy also went through periods of weaker demand, reflecting the state of the still-fledgling market for sustainable investing. Initially it was regarded as an innovative solution in a market with a clear lack of professional alternatives, and demand was largely driven by ethical perspectives. But in these early years, economic headwinds could still push investors back to focusing on what they knew best, and fears that sustainable investing could cost returns prevailed. Global initiatives gradually heightened awareness of ESG issues, while improvements in data, investment techniques and increased academic research supported the financial case for sustainable investing. Momentum has really taken off in the past decade, with a steep increase in investor appetite for sustainable products, and we have not looked back.

Figure 2: Performance since inception of NN IP's oldest sustainable fund



Source: NN IP Performance Measurement. Shown is the performance of the Dutch-based fund NN Duurzaam Aandelen Fonds. Please be aware that this fund is only available in the Netherlands for residents of the Netherlands. Returns shown are merely provided as an example and are by no means intended to solicit sales of investments or subscription of securities either within or outside the Netherlands, where sale of this fund is prohibited. Returns are indexed from June 2000 until end of May 2020 and presented in EUR after all transaction costs, but before management fees. Returns include the reinvestment of income. Past performance is no guarantee of future results and the possibility of loss does exist.

Evolving by enhancing a tried and tested approach

Our basic approach has not changed over the years. We look for high-quality companies with sustainable businesses and a strong competitive position that are aware of their role and the responsibility they have to society and act accordingly. We take a long-term view and focus on a company's future potential. It's all about finding tomorrow's winners. That said, our process has evolved in various respects. The number of external data sources has grown significantly and we have expanded our external research partnerships with parties such as Sustainalytics, the European Centre for Corporate Engagement (ECCE) and Yale. These changes have enabled us to adapt and enhance our analyst input and ESG screening methodology to keep pace with the size and increasing sophistication of the responsible investing space.

> **'Our expertise, independent thinking and our innovative value-chain approach are all key elements of the strategy's success.'**

One area that has remained stable is the team, although it has expanded to keep pace with the strategy's growth. The team started off with three dedicated people, supported by NN IP's general equity analysis capacity. I have been responsible for managing the strategy since early 2004 and now work with a dedicated sustainable equities team of 15 people, including portfolio managers, research analysts and data scientists. I attribute much of the strategy's success to the team's shared passion, mindset and commitment,

and its open culture, but also to its collective level of expertise. Our team's expertise, independent thinking and our innovative value-chain approach are all key elements of the strategy's success.

Looking to the future

Before the outbreak of the corona crisis, the 2020s were already looking like a watershed decade for responsible investing. Increasing numbers of investors are making sustainability a default part of their selection criteria and this is also reflected in increased regulation, such as the ambitious plans for an EU taxonomy. Initiatives like this could hasten the pace of capital flows into the "green" parts of the economy.

In terms of reporting and transparency, the bar is constantly being raised. The current unprecedented situation, as the world grapples with the combined humane and economic impact of the corona pandemic, is also increasing focus on social and governance factors. In our sustainable equity strategies, this focus simply reflects our long-term concerns. We have consistently weighted social and governance factors equally to environmental factors, which have been at the forefront in terms of news coverage in recent years.

How companies look after their employees and how flexible and adaptable they are will determine how they emerge from this crisis. Companies with a focus on sustainable solutions will also be well positioned to face the next 20 years and beyond. Although the challenges ahead are unknowable, our focus on investing for resilience and sustainable growth means that we are well prepared for whatever the next 20 years might bring.

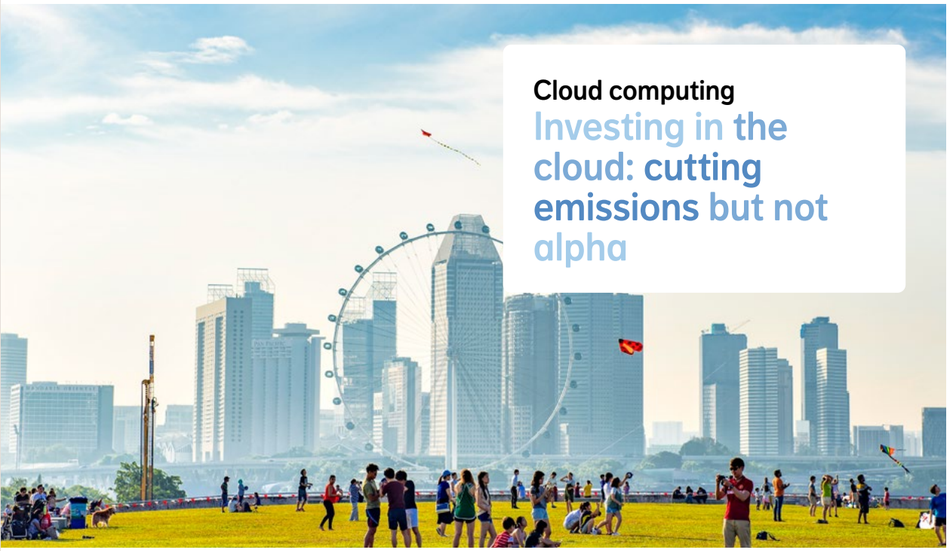
Hendrik-Jan Boer
Head of Sustainable &
Impact Equity Investing


Sustainable solutions for the 21st century


How it works
Creating a portfolio of high-quality sustainable companies

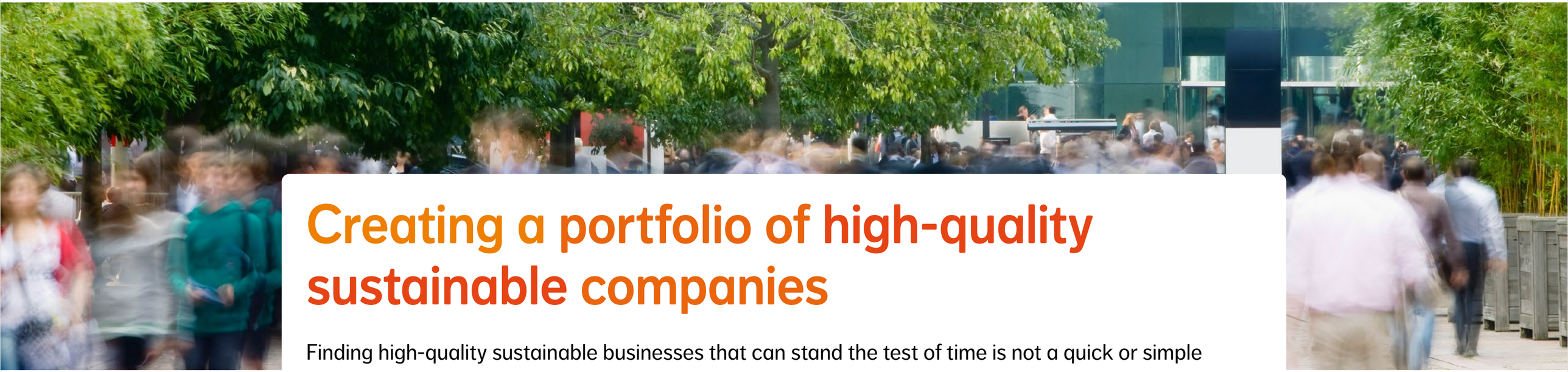

Success stories in sustainable equity investing


Climate change
Climate change and the winners of the energy transition


Cloud computing
Investing in the cloud: cutting emissions but not alpha


Healthcare
Towards a healthier society

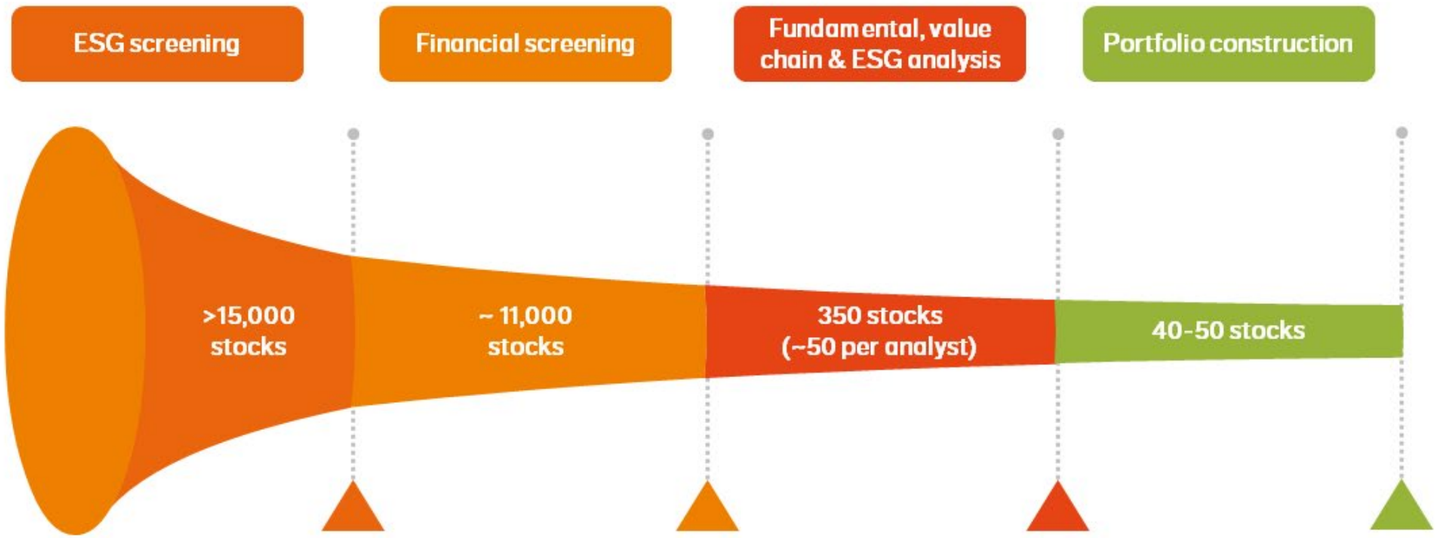

Our team



Creating a portfolio of high-quality sustainable companies

Finding high-quality sustainable businesses that can stand the test of time is not a quick or simple process. It means being selective: narrowing down the investable universe step by step until you reach a well-rounded portfolio. Within our sustainable equity strategies, we employ a high-conviction approach that seeks out companies with high and resilient long-term returns and corporate growth potential. By means of our systematic and transparent selection process, we seek to ensure that every company in the portfolio fulfils our requirements and makes a positive contribution to a more sustainable world.

Consistent and repeatable approach – from research to investment



Sophisticated bottom-up screening

From 15,000 stocks to 11,000: raw ESG preliminary screening, exclusions on activities and behaviour

The first step of our selection process comprises a raw screening for environmental, social and governance (ESG) factors. Companies that fail to meet our standards in this area are not eligible for investment. It's therefore most efficient to screen them out in the early stages, so that we can focus on our global eligible investable universe.

In this step, we exclude companies that aren't transparent on ESG or that score very poorly on ESG metrics from mainstream external data providers. We also exclude companies that don't align with our norms-based restriction criteria, such as our restrictions on controversial weapons or tobacco production, and our more extensive criteria for sustainable and impact strategies[1]. Furthermore, we restrict companies that exhibit poor behaviour, as even if companies' activities are acceptable, they can still behave poorly in terms of environmental pollution, human rights issues, or governance contro-

1 For more details see our Viewpoint Policy

versies. This step reduces the global universe from 15,000 to 11,000 stocks, and our European universe from 3,000 to 1,800.

From 11,000 stocks to 350: companies that generate high and resilient cash flow returns on invested capital (CFROI)

The second step of our process is a detailed financial analysis. To aid us in this, we use the HOLT® screening tool, which provides a thorough and consistent system for comparing companies, with a focus on accounting and valuation metrics. Most companies have their own accounting procedures that often deviate from internationally accepted standards, which complicates the process of making a comparative assessment. HOLT adjusts for this, enabling us to make more of an apples-to-apples comparison on historical achievements as well as projected future progress.

In this step, we screen companies on the spread between their cost of capital and their returns. This cash flow return on investment (CFROI) metric is an effective way of assessing corporate quality and our most relevant measure of economic return. It uses a discounted cash flow model that reflects the long-term perspective. We look at what returns the company is making – the available cash flows that it can invest to grow its business. And we look at what it does with that cash. The CFROI, in combination with the company's asset growth – in other words, the growth of its business – determines the development of its economic profit.

When assessing asset growth, we also look at the phase a company or its product is in – is it in the startup phase, or is it maturing and coming to the end of its life cycle? We prefer to look at a longer-term horizon such as five years or even longer; in this way, we can also integrate and evaluate major societal changes like the energy transition or new trends in consumption and communications. Developments in sustainability are also largely linked to long-term trends and may require a longer time horizon. Ultimately, we're seeking companies with a high and resilient CFROI that are strongly positioned to contribute to and benefit from these developments. We refer to these high-quality businesses as "sustainable compounders", given the long-term compounding effect of these positive economic and societal characteristics.

We use HOLT to screen for:

- winners within a value chain that have a "moat", or **defendable competitive advantage**
- companies generating high and resilient cash flow returns on invested capital (CFROI)
- **attractively valued** stocks
- companies with strong **fundamental business momentum**
- l**ow-risk** companies with low leverage, good accounting quality and aligned management incentives

During this stage of the process, we cut the investment universe from 11,000 to just 350 names in the case of our global portfolio. For our European portfolio, we cut the investment universe from 1,800 to 100 in this step. This is the universe that we start to analyse closely from a bottom-up corporate perspective.

From companies to value chains

Up to this point, we have not classified companies into industries or sectors. Individual company selection comes first. Companies that fail to meet our fundamental ESG or financial criteria are not eligible for inclusion in our portfolios, no matter what industry they're in.

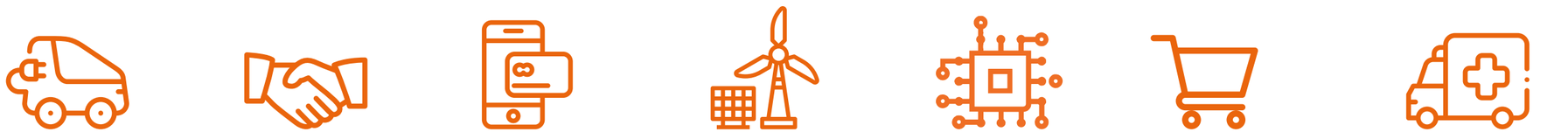
From this point on, we look at these companies in a broader context. In doing so, we focus more on industries and value chains than on traditional sectors. For example, the energy value chain includes traditional energy (oil & gas) as well as renewable energy companies like solar and wind-panel producers. This value chain also includes companies that make the components for these industries. Most of the non-traditional energy companies are typically in the traditional industrials, materials and IT sectors. As a result, the coverage for the energy value chain is much broader than simply traditional energy companies and their service providers.

When we look beyond sector constraints and take a more flexible approach, we discover which part of a value chain actually creates the most profit, and which companies are in the sweet spot. We look at the segments that feature the highest returns on investment, driven by strong moats, based on technological advancements, patent protection, and cost-leadership in markets that are not yet fully mature – that is, where there are still ample or new attractive growth opportunities.

Our analysts also have a value chain focus, each covering around 50 stocks in one of the value chains illustrated below. They identify and assess new trends and find new data sources. Because they aren't constrained by traditional sector definitions, they are better equipped to locate potential growth opportunities. For example, our financials analyst sees little value in analysing most banks but instead focuses on other strong parts of the financials value chain, including companies that create the network or provide processing technology or data. These companies are often not financials in the traditional sense, but we believe they largely represent the future of the financial system.

ESG – materiality, momentum and engagement

In defining our sustainable equity portfolios, we also take another close look at ESG metrics in the bottom-up analysis of our narrowly defined eligible universe. This goes beyond the straightforward screening in the first step of our process. Although external ESG scores are useful as an initial filter, they



are insufficient for identifying truly sustainable companies. They are usually backward-looking and there is not always a logical or material link between the scores and a company's behaviour and business model. There is also a significant bias towards larger companies with the resources to produce annual sustainability reports.

In our deeper assessment of ESG factors, we focus on the material issues that affect a company's sustainable performance. Materiality differs significantly between industries and segments of the various value chains. For businesses involved in new energy production or technology, the environment is obviously a crucial concern. In the healthcare sector, the most important sustainable topics focus more on the privacy of client data, reliability, access to affordable healthcare and working for the greater good of society.

Our proprietary research, conducted in collaboration with the European Centre for Corporate Engagement (ECCE), shows that absolute ESG scores are more a reflection of a company's market cap than a helpful indicator of future returns. Furthermore, policies often show huge gaps with true behaviour. This research also taught us that a company's positive progress on ESG metrics is often a better indicator of future returns than the overall and absolute scores.

It's therefore crucial to do our own research if we want to locate truly sustainable companies with potential for additional alpha. This requires significant analyst manpower and intensive engagement with companies. Each company's story is different, and sometimes by looking closely, we can discover aspects of a company's sustainability profile that aren't obvious from a cursory glance. Dealing with companies means dealing with people, so engagement is also a vital tool in assessing non-quantitative idiosyncratic risks related to corporate behaviour.

High-conviction portfolio

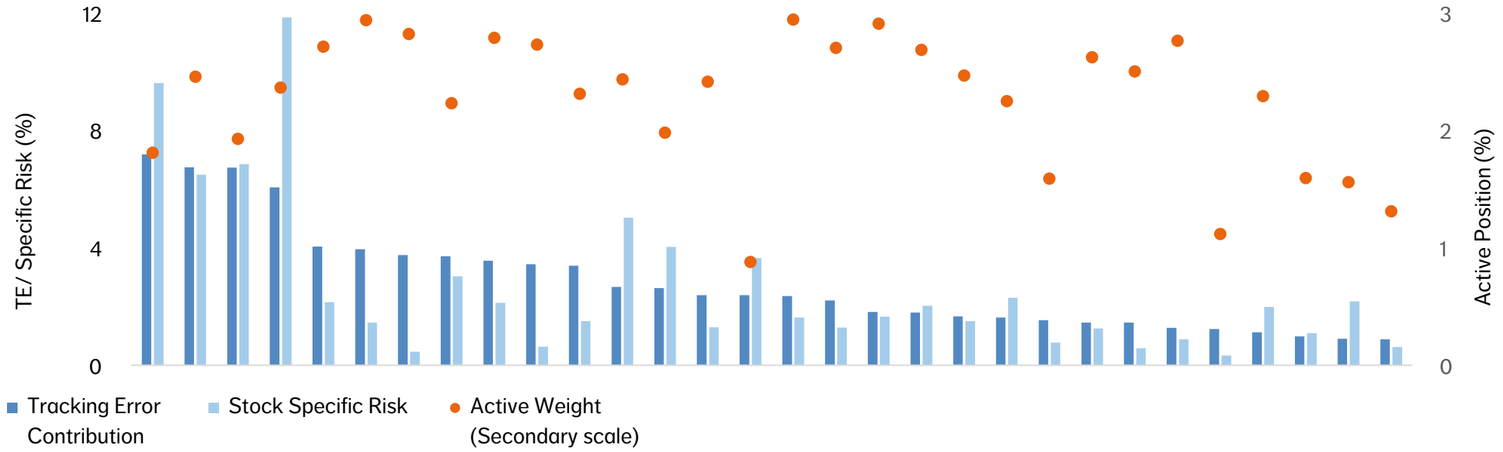
Building a concentrated but balanced portfolio

In the final step of our selection process, we determine our favourite stocks on individual metrics, while ensuring a balanced and resilient portfolio. Although our strategies are high-conviction, they are benchmarked against the standard MSCI World and Europe indices. This means that we need to construct a portfolio that's diversified over the various value chains, so that each stock we select has a decent chance of contributing to alpha. We also carefully manage the contribution of each stock to the tracking error – how it contributes to the portfolio's performance versus the benchmark – by evaluating its upside potential, correlation and volatility and the predictability of the business model.

We closely analyse how this portfolio performs versus the benchmark, measure tracking error and run risk scenarios to stress test the portfolio so we can enhance its robustness and limit downside risk. For example, we use historical correlations to measure the effects of a major drawdown of the market, a spike in interest rates, a strong move in gold or oil, and so on. We do this to ensure that, even with our high-conviction portfolio, we are sufficiently diversified and resilient to withstand high-impact events.

Ultimately, we end up with a portfolio of about 40 names for each of our strategies, against a benchmark of more than 1,500. And it's thanks to the depth and intensity of our selection process that we have a high level of conviction in each and every one of our holdings.

Optimising risk and upside potential



Source: NN Investment Partners. Each data point represents an individual stock. Company names redacted.

The path to sustainable value creation

Our selection process is geared towards investing in economically and socially attractive companies. Stakeholders are increasingly focused on corporate citizenship, controversies and sustainability. Companies face ever-increasing demands for more transparency and better data on sustainability aspects, as investors want to see the true, measurable ESG impact of their investments. Our investment approach focuses on corporate quality, reflected in the economic business models as well as the material ESG merits of our holdings. These elements complement and reinforce each other.

As a result, our portfolio consists of companies that offer sustainable and often innovative solutions, display sustainable behaviour and control their own growth and returns. Structural corporate growth and profitability ultimately determine stock prices and valuations. Selecting the most attractive industries, positioning on the sweet spots in value chains and identifying sustainable winners remain the key to long-term success in equity investing.

Success stories in sustainable equity investing

Markets today are more efficient than ever. The ever-increasing speed of information transmission and constant focus on short-term returns mean that an active, long-term investment approach is more and more important if you are to distinguish yourself from the pack. In 2019, the NN IP European Sustainable Equity strategy did just that, generating an absolute return of +36% and a relative outperformance compared to its benchmark of 10%[1]. This achievement is a testament to the strength of the dedicated team behind the strategy and the success of their long-term, ESG-materiality-focused approach.

1 Benchmark: MSCI Europe (Net)

Hendrik-Jan Boer, who heads up Sustainable & Impact Equity Investing at NN Investment Partners, explains what caused last year's stellar outperformance. He also explores the benefits of a value chain approach, the importance of materiality in sustainable investing, and why a long-term investment horizon pays off.

A real team effort leads to success

Even before 2019, the strategy had a solid track record of resilience in the face of adversity. "We consistently performed well despite global tensions such as the financial crisis, Brexit and Trump's election," says Boer. "Although the markets were on our side as equities across the

board performed well, for me, the reasons are closer to home. It is largely thanks to the work we've been doing behind the scenes, to get the team where it needs to be." The strategy is now run by a dedicated team of 15 people, and Boer credits much of the success to their combined efforts. "We all have the same mindset, the same criteria and objectives, and that leads to a high level of conviction in our portfolio."

The strategy's success also owes a lot to the team's focus on in-depth analysis. "Before we invest in any company," Boer explains, "we bring together all the team members to get their take on the stock; the positive factors and the potential pitfalls." This part of the process has real implications for decision-making and portfolio construction. If opinions differ strongly or new key arguments come to light, that can be a reason to reassess or even not to invest. "Ultimately, we want to create a portfolio that the whole team feels comfortable with."

The benefits of a long-term perspective

The first step in the investment process is to apply a binary ESG data screening that leads to the exclusion of certain companies from our investment universe. "For example, we exclude several activities at industry level – weapons, gambling, tobacco – as well as companies that have a track record of behaving very poorly in the execution of their business processes." This can range from serious environmental pollution to a negative track record on human capital issues or major corporate governance controversies. The team also screens out companies with very negative ESG momentum. "But all this only reduces our global universe from 15,000 to 11,000 stocks, so ESG screening still leaves an immense investable universe, contrary to what many often think."

After this initial screening, the team uses the HOLT® system for an initial financial screening of its starting universe. "Why use HOLT? First of all it gives us an enormous universe, far beyond the usual benchmark names, and a lot of room to play with – having a wider scope is always beneficial. Secondly, this tool analyses companies in a highly consistent and rigorous way." Each company has its own accounting standards and its own methods of dealing with pension liabilities, depreciating goodwill, lease arrangements and so on, which can make comparisons difficult. As Boer explains, the HOLT tool adjusts for these discrepancies, so we can make apples-to-apples comparisons.

> **"The way we invest sustainably links naturally to long-term trends"**

Furthermore, the HOLT methodology offers a powerful lens for looking at the long term, which is what matters to Boer and his team. "We invest for sustainability, but this should be naturally linked to corporate business models and their long-term trends. But also from an investment perspective, we have all had bad experiences from taking too short-term a view on what makes a stock go up." At this point, financial markets are so efficient and fast that everyone works with the same news and the latest corporate data. As a result, Boer explains, most of this is already factored into the consensus view for the first two years out.

"The HOLT tool, on the other hand, uses discounted cash-flow models that better reflect and resonate with a long-term perspective. We look at the cash-flow return on invested capital – the cash at hand that can be invested

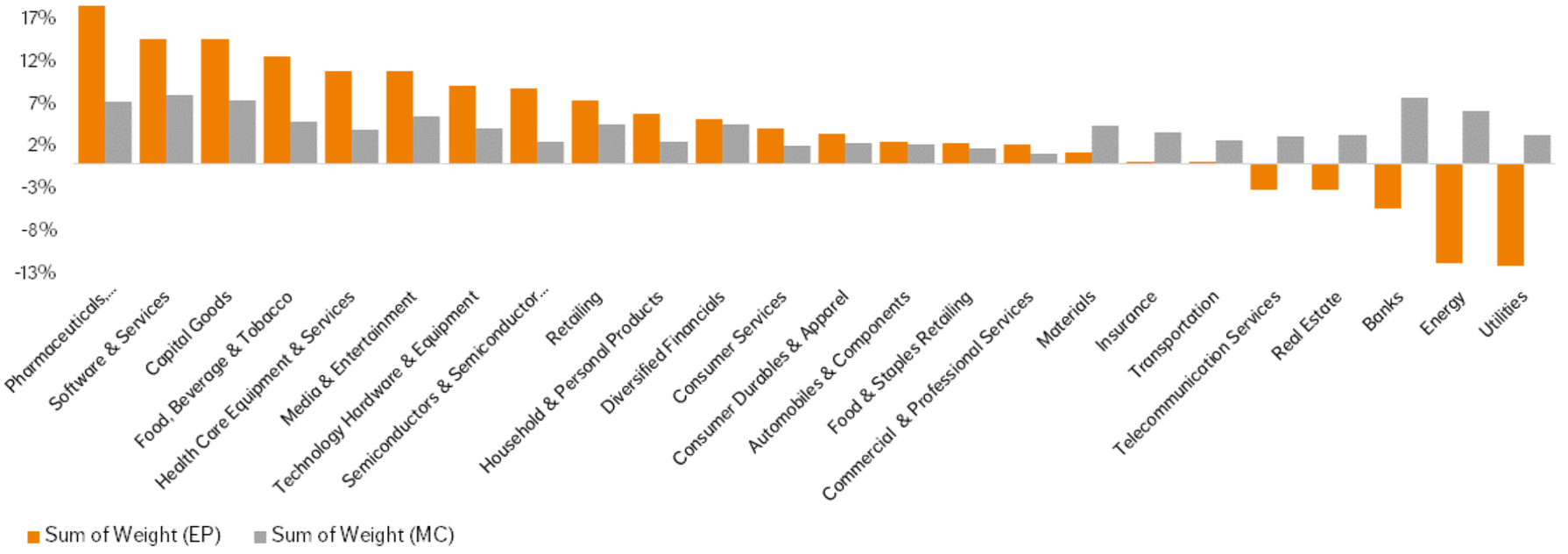
in new assets or allocated to investors – and at how the company uses it." This return, in combination with the asset growth, determines the company's economic profit. The most important metric to the sustainable equity team. "Ultimately, we prefer to look at a longer-term horizon, say five years. Then we can evaluate big societal changes like the energy transition or new trends in consumption and communication, and identify major deviations between our expectations and the market's perception."

Portfolio preferences: assessing the value chain

When it comes to selecting the best investment opportunities for the portfolio, the team initially looks from an industry perspective to determine which areas structurally offer the best profitability. "Most of the time, and academic research also confirms this, returns are determined more by the industry a company is in than by the qualities of the company itself," says Boer. If an industry performs badly, this is often indicative of structural issues such as the commoditisation of its products and services that has led to intense

Which industries generate economic profit?

MSCI World Index misrepresentation: Industry Group Economic Profit vs. Market Cap weights



competition, low barriers to entry, or changing consumer behaviour that favours alternative products. “We prefer to avoid structurally unprofitable and low-profit sectors that barely make their cost of capital, such as banks, chemicals, utilities or even real estate. There are sometimes exceptions – you might find a successful niche materials firm, for example. But overall we prefer industries with the capacity to generate higher average economic profits.”

The team has value chain analysts rather than sector analysts, which makes for a much broader range of coverage. “In the energy value chain, for example, we include solar and wind as well as companies that produce components for these industries. These companies are typically in the industrials or IT segments rather than in energy or utilities.” On a similar note, the team’s financials value chain analyst follows very few banks because their returns are very low. “But we do see strength in companies that create the network and support the necessary payment operations – like Visa, Mastercard, Adyen[2] – or those involved in data processing or creation, such as Moody’s or stock exchanges. Data is arguably the new fuel of the world.”

When it comes to the selection of individual stocks on economic grounds, the team first excludes any companies that make insufficient returns relative to their cost of capital. “After that, we look for companies that are not only making good returns but also demonstrate strong asset, or capital, growth. We therefore also look at where in the life cycle each company is: is it in the startup phase, the growth phase, the easy cash flow generation phase, or is it maturing and coming to the end of its life cycle?” This process reduces the universe from 11,000 names to around 350 for the global portfolio, which is the universe that the team analyses very closely. “This is also where we analyse ESG integration in the business models in much more detail, and where we want to see our investment opportunities moving in the right direction and showing the right behavior.”

This analysis is very rigorous and has a long-term focus. “We don’t need to fully screen the universe every month, because the long-term metrics we look at do not change that rapidly. Sometimes it’s more a case of slowly becoming aware of a new trend and wondering what impact this could have on our holdings and favoured industries. We might then take another look to see if anything new affects our criteria.” The team then constructs the total portfolio with an eye to diversifying across the different value chains. “We believe that each stock should have an equal chance to contribute to alpha, and so we make sure our portfolio characteristics are not too tilted in favour of any one single name.”

The overall portfolio does over- and underweight certain sectors, within the confines of our sector limits. It overweights IT, healthcare, and certain consumer sectors, and clearly underweights energy and utilities. But as Boer explains, this risk is highly controlled. “What’s important is how our portfolio behaves versus the benchmark. We assess this by looking at our tracking error composition, how our portfolio behaves in different scenarios, such as a major market draw-down or a spike in interest rates. We find ultimately that we are so diversified that even a very strong and unexpected market move is unlikely to put a dent in our relative performance.”

2 For illustration purposes only. Company name, explanation and arguments are given as an example and do not represent any recommendation to buy, hold or sell the stock.

Materiality matters

With regard to sustainability issues, material factors are what's important, and these differ significantly between sectors. "Take UnitedHealth[2], a US healthcare insurance provider, for example," explains Boer. "For a company like this, the most important sustainable topics don't relate to the environment or carbon footprint. Privacy of client data, reliability, access to affordable healthcare, working for the greater good in society are more relevant factors. And since it's a healthcare company, it shouldn't seek to profit too much from its clients."

Conversely, for companies involved in new energy production or technology, the environment is a crucial concern. But even then, it's not a simple equation. "Companies like Microsoft[2] use massive amounts of energy. But by moving everything to cloud servers, storage can become very energy-efficient, as it means using one cloud machine for multiple clients. This leads to very high capacity utilization. In combination with Microsoft's ambition to source all their energy needs sustainably in a few years, this represents an enormous step towards a smaller carbon footprint." For Boer, sustainability analysis means looking at the subtleties, not just taking things at face value.

> **"Every story is different with its own specific elements that contribute to sustainability and returns"**

At the end of the day, the team aims to link a company's sustainable behaviour to its core activities and its potential for generating long-term returns. One example here is Neste[2], a biofuel producer that converts leftover fats from a variety of sources into airline fuel. "In turnover terms this business line represents only a small part of the company's revenues, but it already represents the majority of its profit," Boer says. "Neste also enjoys pricing power because the amount of biofuel used per liter of kerosene is still small, but it's worth a lot to airlines because it helps them improve their sustainability profile and comply with ever more stringent expectations. And because of this pricing power, Neste now consistently generates healthy returns."

Ultimately, each company in the portfolio has a different materiality framework, so each one requires close analysis. "Of course there are overarching portfolio characteristics – in terms of carbon footprints and certain governance metrics, for example – but every story is different with its own specific elements that contribute to sustainability and returns."

Sustainability is not always obvious

It is not always clear where the most sustainable investing options are. This can be particularly true for social concerns, where sustainable contributions are often harder to quantify than environmental aspects like a company's carbon footprint. A good example is Match[2], a holding in the Global Sustainable Equity portfolio. This company owns dating platform Tinder, among other things. "Many people question the sustainability of a company like this, but it has done a great deal for people in social terms. We all have friends and colleagues or know people who have difficulty finding a partner that have benefited hugely from using these platforms. The social benefits of reducing loneliness are massive and unquantifiable."

The global portfolio also owns Amazon[2], a company that has frequently been challenged on both social and environmental aspects. "We receive a lot of

questions about its carbon footprint, but the calculations show that all else being equal, centralised distribution means that ordering items online is more efficient. This leads to a much smaller carbon footprint than everybody driving around to do their shopping." As for social aspects, the team has actively engaged with Amazon on the rights of warehouse workers, among other things. "We have seen positive changes. Last year they were among the few companies that substantially increased minimum pay for their employees." But as Boer points out, improving these types of situation in relatively new and young industries will also require action from governments and regulators. "All of these are issues that we need to work on together – investors in their engagement with companies, but also consumers, regulators, and the companies themselves."

Moving beyond ESG ratings

For Boer, "real" ESG integration is not just applying ESG scores from external providers. He views this as a very simple and basic filter that no longer provides alpha. "Why? Because the rest of the market also has access, and there's often no logical economic link between the methodology of these scores and a company's true business activities. What we do is focus on materiality, which requires close engagement with companies." Sometimes,

he says, looking closely at a company can lead to new insights that the market isn't yet aware of. "I don't mean non-public information, but information that wasn't included in the company's sustainability report, for example, perhaps because they don't yet have one."

Bakkafrost[2], a sustainable salmon producer, is a key example. The firm's low Sustainalytics rating largely stems from its lack of sustainability reporting. "We think that's ridiculous. They're raising salmon in a sustainable way, without antibiotics, in a pollution-free environment." From conversations with the company, the sustainable equity team has also learned that Bakkafrost is creating a biogas terminal to process its remaining waste, and will also be publishing a sustainability report. "So from that direct contact, we know their Sustainalytics ESG score will probably improve."

Relatively small companies are also more likely to face low ESG ratings. They do not have the resources of multinationals, with 10-20 people on hand to write their sustainability reports. "But this doesn't reflect on the quality of what the mid-caps are doing." SolarEdge[2], a producer of inverters and optimisers for solar panels, is a good example. Based on its technology and skill, SolarEdge is expected to become the preferred partner of utilities for industrial solar installations. This segment is set to accelerate, as the current growth rate of solar will need to increase three- or fourfold to attain the 2050 net zero emissions targets. "Still, SolarEdge remains a relatively small company without the capacity to create an extensive annual sustainability report. Because they don't produce it, they don't tick that box and therefore receive a lower rating."

Conversely, many oil companies have relatively high ESG ratings. As Boer explains, this counterintuitive outcome is the disadvantage of so-called sector neutrality, which means taking the leaders from each industry. "In the end you're still investing in an oil company, which is highly pollutive. We draw the line here. We prefer to opt for innovation." In the past, many investors viewed the whole exclusion of the oil sector as a dangerous investment approach because if the oil price rises, oil stocks will also go up. "But these days, renewable energy sources are so efficient that when the oil price rises, it becomes economically even more sane to choose solar."

Looking to the future

As companies and markets move towards environmentally-friendly policies, the value of an actively sustainable approach may appear to be diminishing. Boer admits that the market is certainly evolving. "We all know that we're on a downward path, environmentally speaking, and we need to improve our sustainability. But although the benchmark's ESG scores have increased,

has the benchmark itself become more sustainable? I don't think so." Many investors and companies are talking the talk, but he contends that much of this is compliance with some box-ticking, mostly focused on governance and less on the environment. "Furthermore, many people are investing in passive funds. Funds like these are not able to be truly sustainable like we are."

> **"Over decades, the most successful investors are those who focus on long-lasting quality."**

For Boer, it is shocking that many analysts fail to make a connection between the major issues facing the world today and the future of the firms they follow. "But over decades, the most successful investors are those who, like us, focus on long-lasting quality. That includes economic quality but also quality linked to material ESG concerns or opportunities." Investors like these, he contends, have a very specific, dedicated way of doing research, and that applies both to smaller boutiques and some of the more famous individual top investors. "And still, the majority of investors are not paying attention to this. They want something that will do well immediately."

This is especially evident from conversations with clients, who are often focused on problems that have a temporary impact. "But with our long-term focus, we're looking at the situation five or seven years down the line. The coronavirus is creating huge waves in today's markets, but it's impossible to extrapolate from this what markets will look like in five years." As Boer explains, the companies in which they invest are so high-quality and resilient that they should still outperform their rivals in the long run. "So with that in mind, why would we step out now?"

Ultimately, Boer says, the most important factor driving long-term returns is the underlying earnings current. High quality leads to a stronger underlying earnings current, and in turn to long-term stock market success. "If you have a company that can internally finance its high growth and continues to generate excellent cash-flow returns, you get a fantastic earnings compounding effect. The market cannot ignore this and share prices inevitably have to follow. All the rest is random noise."

Climate change and the winners of the energy transition

- The transition towards sustainable energy sources will require all sectors to decarbonise in the coming decades
- This transition presents challenges but also creates tremendous growth opportunities for renewables, networks and storage
- Our sustainable and impact equity team seeks out the winners of the energy transition, with the goal of generating strong returns while creating a more sustainable world

To meet Paris climate goals and mitigate the impact of global warming, all sectors must transition towards electrification and decarbonisation. With the economics of renewable energy sources rapidly improving, this transition is becoming more affordable and thus ever more inevitable. This creates tremendous growth opportunities for renewables, networks and storage. Still, the big question is which companies will create the most economic value from this opportunity.

Our sustainable and impact equity team seeks high-quality companies with economic moats enabling consistently high returns on capital, as this drives value creation and finances superior growth. In this paper, we explore the energy transition value chain, including energy, utility and renewable equipment companies, to explain how we search for energy transition winners while avoiding companies with likely future stranded assets.

With the growth of global warming research and projections, the energy transition has increasingly entered mainstream economic discussions. Carbon emissions have meanwhile continued to rise, boosted by growth in China and other emerging economies. Fossil fuel and industrial sectors represented some 89% of anthropogenic carbon emissions globally in 2018, according to the Global Carbon Project (Global Carbon Budget 2019). Meanwhile, renewable energy represented just 10% of total global final energy consumption, unchanged from 2010. This reflects the rising energy usage in emerging markets keeping pace with growing renewable installations.

In December 2019, the European Union announced its “Green Deal”, with the goal of making the EU economy climate-neutral by 2050. This goes further than the Nationally Determined Contribution (NDC) emissions reduction goals set after the Paris Agreement. Reaching this goal will have serious implications for our energy system. First, we must be far more energy-efficient. Second, electricity production must be almost emissions-free. Most of our energy should come from renewable sources, while remaining carbon emissions should be stored underground or offset by planting trees. Third, transport and heating must decarbonise via increasing electrification.

Until recently the key drivers enabling the transition were government targets and subsidies. Government support will remain crucial, but on the power generation side, the economics of wind and solar power have greatly improved in recent years. Meanwhile, companies are boosting demand by increasingly setting renewable energy targets.

Subsidies and other incentives will still be needed for transmission, back-up generation and storage of power. Furthermore, additional distribution network investments will support the transition to renewable and distributed generation. Energy efficiency is becoming more viable in economic terms due to higher energy costs driven by increased carbon prices and higher network and subsidy costs. However, this too will require further stimulus.

This all creates tremendous growth opportunities while replacing demand for fossil fuels.

Although reaching carbon reduction goals presents challenges for companies throughout the energy value chain, it also creates investment opportunities. Companies that invest today in the transition to renewables will be best placed to succeed in a more sustainable world, while investors who identify the future winners will reap the dividends.

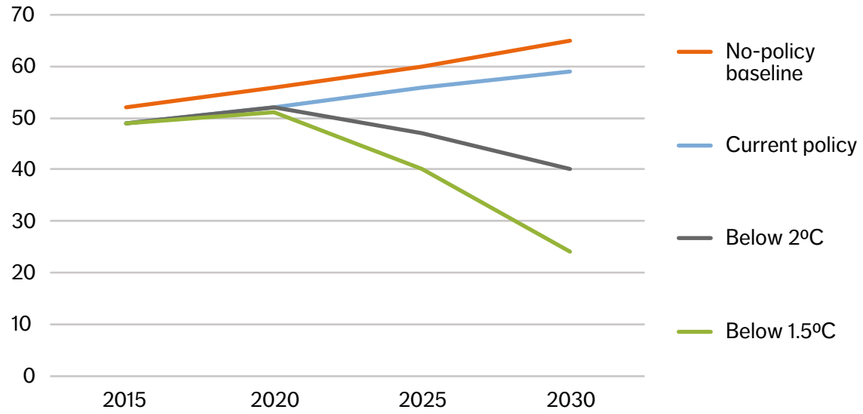
Global warming drives electrification and decarbonisation

Today, human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels. Under the 2015 Paris Agreement, countries agreed to "hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels". In its October 2018 report on the impacts of global warming of 1.5°C, the Intergovernmental Panel on Climate Change (IPCC) calculated that the world must maximise net future emissions at ~600 Gt CO_2 to remain below this threshold.

Starting from ~40 Gt+ emissions in 2018, this implies that net global CO_2 emissions should be zero by around 2050. To achieve this, we must accelerate the decarbonisation of power generation, industry, transport and buildings. At the current pace of transition, even with the commitments related to the Paris Agreement, emissions are instead expected to grow until 2030 (see Figure 1).

Many scenarios have already estimated the action needed to limit global warming to 1.5°C or below 2.0°C. All point to acceleration of both decarbonisation and electrification as well as energy efficiency. It will be necessary to increase the share of electricity in energy consumption to replace fossil fuels for transport and heating. The International Renewable Energy Agency (IRENA) estimates that to keep global warming within ~2°C, energy-related emissions would need to decline by 70% versus today's levels. This scenario assumes that 54% of CO_2 reductions will come from renewable energy and electrification and 40% from energy efficiency. To limit the temperature increase to ~1.5°C, net annual emissions would need to decline to zero by 2050.

Figure 1: Global greenhouse gas emissions under different scenarios ($GtCO_2$)



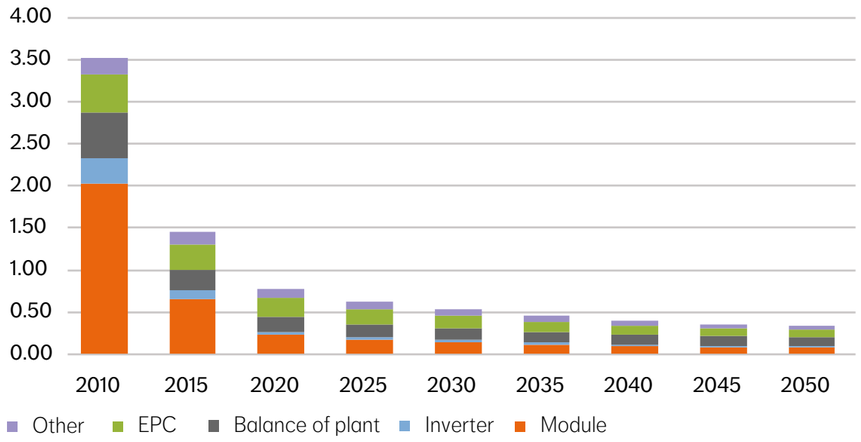
Source: UN Emissions Gap Report, NN Investment Partners

Aurora Energy Research has calculated that to reach a net zero scenario, 80% of energy used must be renewable or nuclear by 2050. Renewables have taken the lead over the past decade, as nuclear generation is often

controversial and in most countries is much more expensive today than wind or solar power. The remaining CO_2 that is produced would need to be stored. For this scenario, global renewables installations would need to grow four-fold and grid expansion capex would need to double from the current level.

Renewables now represent 24% of total global power generation versus 20% in 2010. Strong growth in wind and solar power generation is masked by slower growth in hydro generation, which constituted most renewable energy in 2010. Despite growth in renewable power generation, renewable energy as a percentage of total energy consumed has stalled at 10% as thermal energy use in the transport and heat (including industrial) sectors, which represent 80% of total energy use today, has risen.

Figure 2: Global capex cost forecast utility-scale PV solar ($/W)



Source: BloombergNEF, NN Investment Partners

Improving economics for renewables are a game changer

Wind and solar power have long been seen as important in the transition to a carbon-neutral society, so governments have spent billions to subsidise them. In recent years, however, costs have fallen so much that even without subsidies, solar and wind power can now compete with thermal and other forms of generation in an increasing number of regions. As a result, companies are becoming more important as off-takers of utility-scale wind and solar projects. In addition, retail consumers are increasingly interested in electrification and distributed generation, while cheaper batteries will allow for decreased dependence on energy suppliers.

Today more than 50% of new generation capacity installed globally is renewable. Growth rates in renewable power have averaged 8-9% per year since 2010. If these trends continue, BloombergNEF estimates that wind and solar will produce half of the world's electricity by 2050, with nuclear, hydro and other renewable sources providing a further 21%.

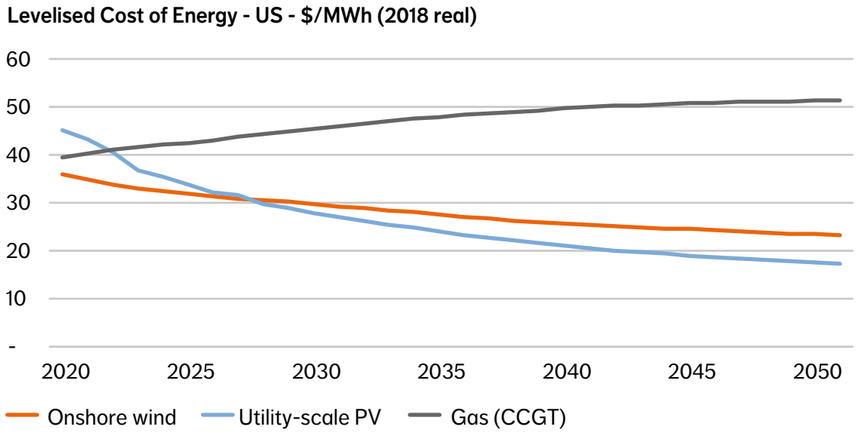
With the growing installed capacity, costs to generate power from these technologies have consistently dropped. BloombergNEF estimates that over the past decade, solar costs per MW installed fell by 28% on average every time the installed base doubled. Meanwhile, onshore wind costs per MW fell by 11% on average with the doubling of capacity. Costs for Li-ion batteries are also falling rapidly, given the 18% learning rate. This means subsidies are rapidly becoming less important while installations are growing.

The levelised cost of electricity (LCOE) of wind and solar power has now fallen below that of fossil fuel sources. LCOE represents the total costs per MWh of production over the lifetime to build new generation capacity, includ-

ing capex, operating costs, fuel costs and financing costs. Historical learning rates would imply respective 77% and 40% cost reductions in solar and wind by 2050. Most estimates are slightly more conservative but still assume strong cost declines.

Figure 3 shows BloombergNEF estimates for cost declines for US utility-scale solar and wind by 2050. These are 62% and 35%, respectively. Meanwhile, the LCOE of gas-fired generation is rising due to falling load factors, as upfront capex costs must be earned back in less running time. As a result, renewables are increasingly competitive versus thermal generation in most regions. Conversely, thermal generation assets are increasingly stranded, as even existing generation will no longer be profitable to maintain and operate.

Figure 3: Wind and solar will soon be cheaper than gas-fired generation



Source: BloombergNEF, NN Investment Partners

Three factors have driven the LCOE decline: lower capex cost per MW, higher power production per MW installed (increased load factors), and decreased financing costs. For solar, module efficiencies have increased by some 2-3% per annum; this increases to 4% with the shift to higher-efficiency Mono-crystalline modules from Multi-crystalline modules. Still, this explains just one seventh of the cost decline, with the rest explained by falling module prices and other solar costs as well as lower capital costs.

Meanwhile, wind generation costs increasingly benefit from bigger turbines. This is partly because of declining costs per MW peak capacity, but also because load factors increase with bigger turbines, especially at lower wind speeds. The fall in financing costs has also contributed to the cost decline, as capex makes up most of the cost for solar and wind projects. Moreover, with debt often representing 80% of a project, equity costs have fallen as infrastructure investors accept low returns for long-term contracted assets.

Some argue that true solar and wind costs are higher than the LCOE suggests. In a future with mostly renewables and very little thermal generation, storage will be needed to balance intermittency, with associated costs. Still, given rapid cost declines, even “true” costs will ultimately be competitive versus thermal generation.

Transition winners in the energy value chain

Our sustainable and impact equity team seeks winners within a value chain that have a “moat”, or defendable competitive advantage. To locate these companies, we use (among other things) HOLT® screening, a tool that provides standardised financials for companies. In the examples on the following pages, we show the cash flow return on investment (CFROI) as our most

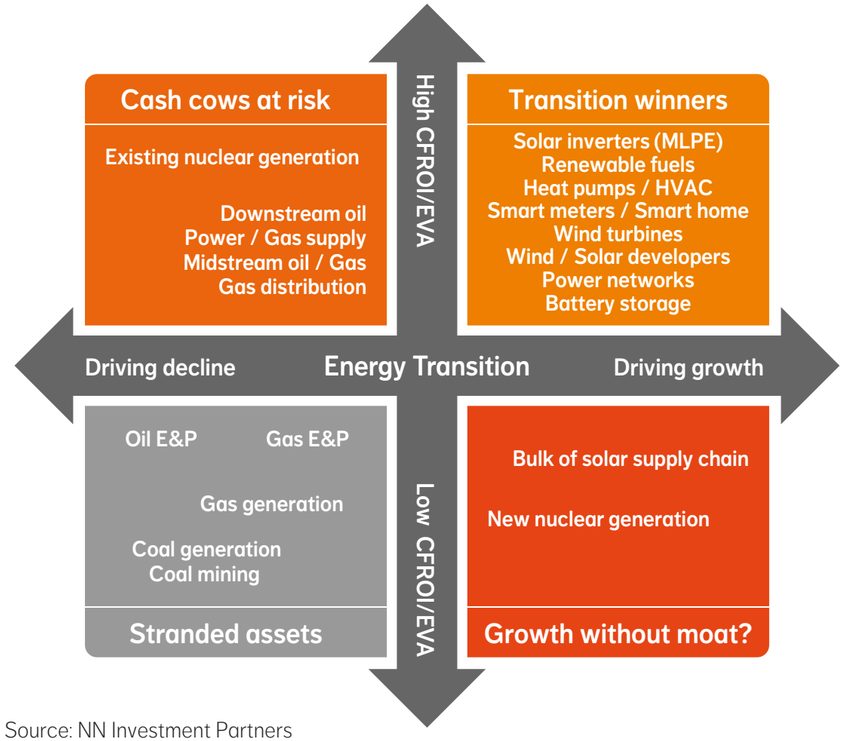
relevant measure of economic return. The spread between this return and the cost of capital determines the economic value a company creates and the cash flow generated to invest for future growth. Companies need a moat to maintain a high CFROI, so our research analysis is aimed at assessing whether a company can indeed defend its competitive edge.

The energy transition is dramatically changing the game for future value creation in the energy value chain. Figure 4 plots our view of how climate change is driving future growth for sub-industries within the energy transition value chain (X-axis) versus the CFROI earned by leading companies in these segments. Our research efforts are focused on the "Transition Winners" quartile, which combines good growth prospects with the ability to earn attractive returns on capital. Companies in the other quartiles can of course enjoy periods of outperformance – driven, for example, by spikes in commodity prices. But in the longer term we expect most stocks in these segments to lag, given the headwinds created by the energy transition or inherent competitiveness in a sub-industry.

Renewable equipment: tremendous growth opportunities, but who creates shareholder value?

The energy transition presents huge growth opportunities for renewable equipment and technology companies. The challenge is to find companies with consistent strong returns. Renewable equipment has disappointed many investors over the past decade, as in many segments there seem to be little or no companies with a moat that provides pricing power.

Figure 4: Identifying the transition winners



Source: NN Investment Partners

Solar

Despite its tremendous market growth, solar has been a difficult segment for investors. Given limited barriers to entry, most of the supply chain is extremely competitive. As a result, very few companies have consistently earned returns above their cost of capital. In most segments, cost of capital or scale seems to be the key differentiating factor. Still, a few companies

have been able to create a moat and have consequently outperformed their peers. A good example is SolarEdge[1], a provider of solar inverters.

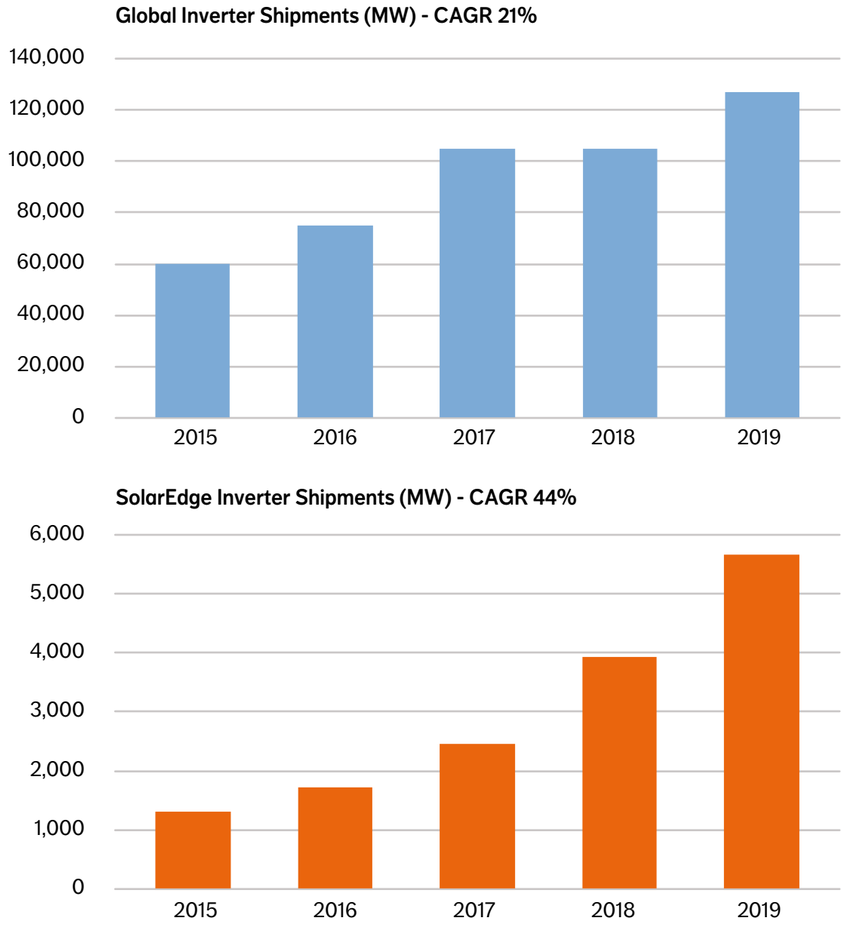
Solar inverters are a critical part of the solar system, converting the direct current from the panels to alternating current as used by appliances and communicating with the power grid. Traditional string inverters face energy loss in the case of shading. This problem was first solved by microinverters for each panel, but SolarEdge launched an alternative, more cost-effective solution: one inverter plus power optimisers per panel.

This cheaper and more energy-efficient solution has resulted in leading market shares in residential installations in the US, Europe and increasingly in the rest of the world (see Figure 5). The technology is also scalable, with SolarEdge rapidly taking market share in the commercial market and planning to enter the large-scale utility market in 2020. Battery storage is another area of growth, as it boosts revenue per installation. As a result, SolarEdge has seen strong growth and consistently high returns on invested capital. In recent years several companies, including SMA and Huawei[1], have launched inverters combined with optimisers. None of these new products have gained material market share, which seems to confirm that SolarEdge has built a strong moat with its technology.

Figure 6 shows CFROI (HOLT-based return on invested capital) for SolarEdge and SMA Solar. Despite still leading the solar inverter market by MW

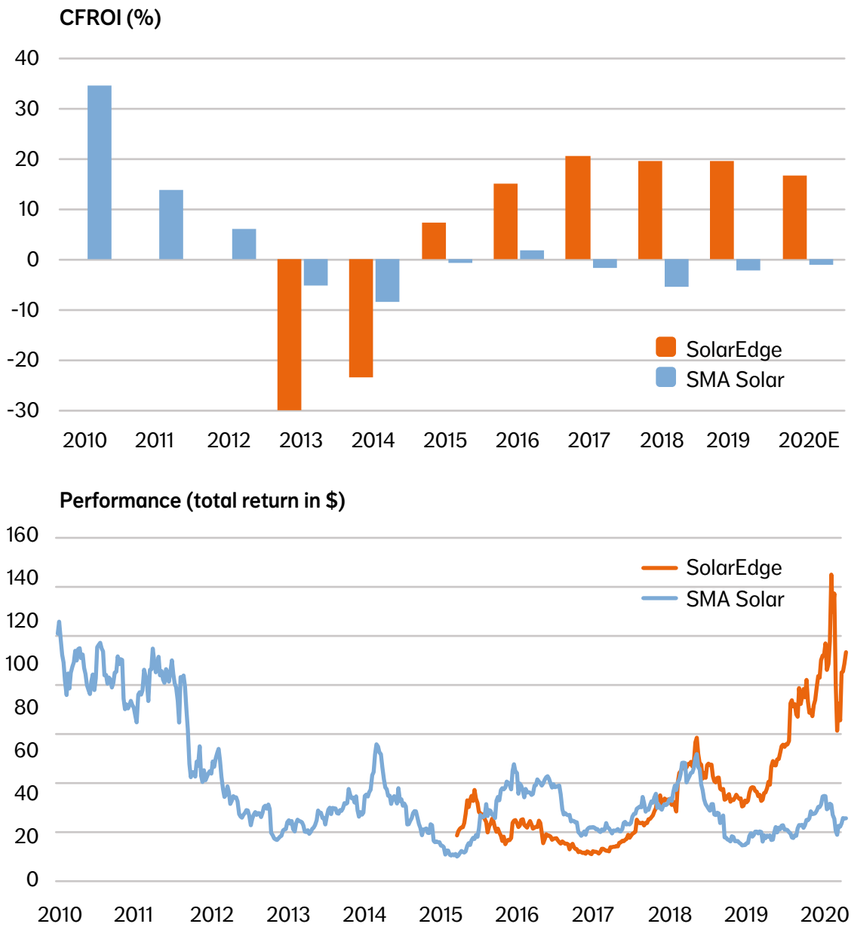
1 For illustration purposes only. Company name, explanation and arguments are given as an example and do not represent any recommendation to buy, hold or sell the stock. The security may be/have been removed from portfolio at any time without any pre-notice.

Figure 5: SolarEdge has gained share in the growing solar inverter market



Source: IHS PV Inverter Market tracker Q3, 2019, SolarEdge, NN Investment Partners

Figure 6: SolarEdge's strong growth and high return on capital have resulted in outperformance



Source: Bloomberg, Credit Suisse HOLT, NN Investment Partners

installed, SMA has struggled in recent years to earn decent returns on capital. This reflects the competitive nature of the commercial and utility-scale solar inverter market. Since 2010, SMA has lost market share in the lucrative residential market to Enphase (microinverters) and especially SolarEdge. Meanwhile, SolarEdge has earned very attractive returns on capital while growing quickly, reflecting market growth and strong market share gains. Our Global Sustainable Equity strategy has been invested in SolarEdge since 2016. As our conviction increased, our European Sustainable Equity and Impact Equity strategies have also invested in the firm, making NN Investment Partners one of SolarEdge's largest shareholders.

Wind

The market for onshore wind turbines is very competitive, with most original equipment manufacturers making low-single-digit or even negative margins on turbine sales in 2018 and 2019. Even market leader Vestas made just a 7% margin on turbine sales in 2019. This reflects aggressive pricing on projects won in first-half 2017 and 2018. Margins should recover going forward, as pricing has stabilised while larger turbines drive down production costs per MW. Furthermore, consolidation is progressing, as the bankruptcy of Senvion and several takeovers and mergers should lead to a favourable market structure.

Offshore wind installations are growing fast, with a 15% compound annual growth rate expected for 2018-30E. Bigger turbines lower the generation cost (LCOE), reflecting lower installation costs per MW and increasing load factors (utilisation). The resulting strong growth in the installed base boosts services segment revenues. Given the barriers to entry with high upfront development costs, this fast-growing segment looks attractive for market leaders Siemens Gamesa, Vestas and GE.[1]

We believe margins on Siemens Gamesa's onshore turbines should improve in the next two years on the back of easing price pressure and cost savings. Conversely, the firm enjoys healthy margins for offshore wind turbines and services, which together make up ~90% of group EBIT (see Figure 7).

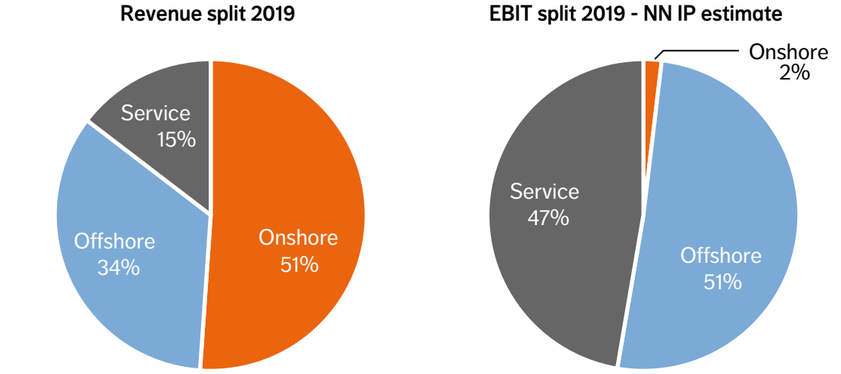
These are growing markets where Siemens Gamesa has a moat. Within the strongly growing offshore market, the firm boasts ~70% global installed base. Services revenues are growing with the installed base, while scale efficiencies have resulted in 20%-plus margins for an asset-light business. Our Sustainable and Impact Equity strategies have been invested in Siemens Gamesa since 2018. In late 2018, we increased our positions as the stock price weakened; this paid off handsomely as the stock rebounded in 2019.

Smart Grid

Electrical equipment makers benefit from the need to add power transmission capacity and make electric distribution grids smarter. Beneficiaries include groups like ABB, Schneider and GE as well as cable producers like Prysmian and Nexans.[1] Smart meter leaders Itron and Landis+Gyr[1] are also highly exposed, as government mandates push for the installation of smart meters. Figure 8 shows that Landis+Gyr's CFROI has exceeded that of Itron in recent years, as it receives better returns on capital from comparable activities. Landis+Gyr earns high margins in North America, where highly profitable software and networking services constitute an important part of its sales.

European margins have lagged in the past but improved strongly in 2019, boosting overall value creation. This is reflected in the firm's strong stock performance in 2019, which benefited our Sustainable and Impact Equity strategies that are invested in the name.

Figure 7: Siemens Gamesa profits mostly reflect attractive offshore and services segments



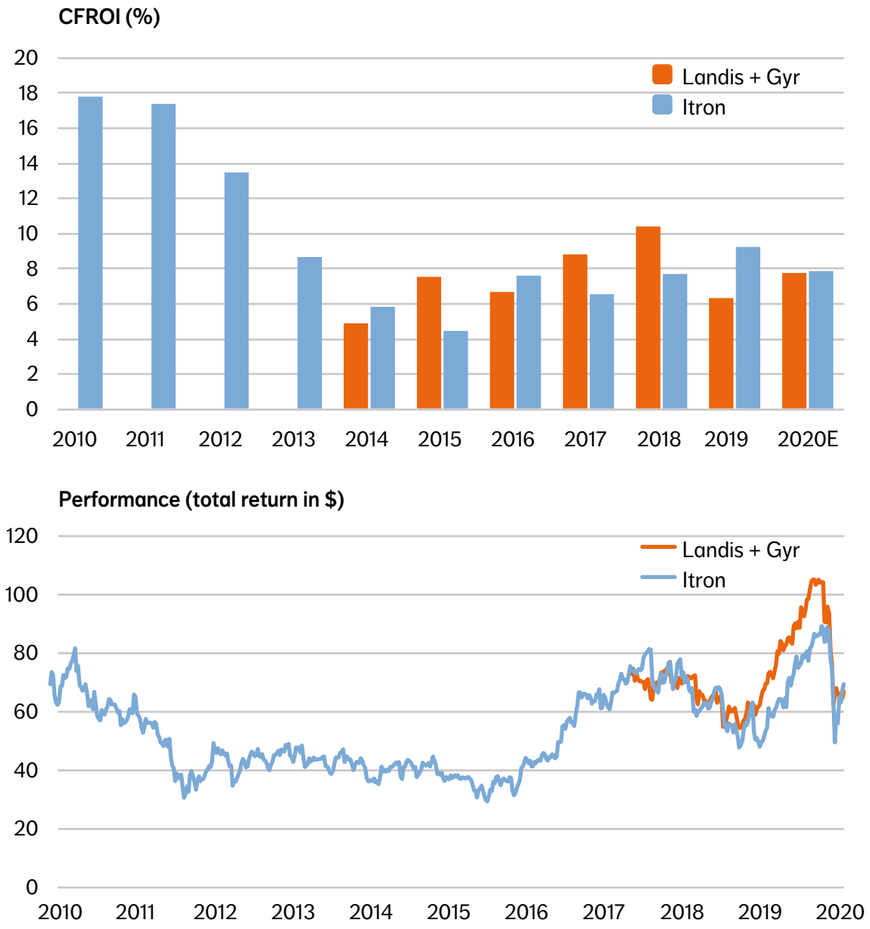
Source: Siemens Gamesa, NN Investment Partners

Utilities: Investment opportunities in renewables and networks

Electric utilities see ample growth opportunities, as renewable installations must accelerate to reach climate goals. Utility-scale renewable projects need transmission, while distribution grids need to be upgraded to facilitate distributed generation. As a result, electric power networks enjoy consistent asset base growth, driving earnings growth for many years to come. This creates shareholder value as their regulated and contracted assets earn a (typically modest) spread over their cost of capital.

Today, the sector mostly focuses on capex on regulated networks and renewable generation. Most equity value is now concentrated in these segments, reflecting weak thermal power generation economics. A typical example is Exelon, an integrated utility combining networks and power gen-

Figure 8: Landis+Gyr's improving returns on capital have driven strong outperformance in 2019



Source: Bloomberg, Credit Suisse HOLT, NN Investment Partners

eration, which in 2010 still made most of its profits from power generation.[1] As falling power profits depressed returns on capital, the stock dramatically lagged in the first half of the past decade. Today, Exelon mostly focuses capex on its growing distribution and transmission networks.

Within the electric utilities space, companies with growing networks in good regulatory environments have been attractive compounders. An example is Eversource[1], focused on regulated distribution and transmission, which has been a strong compounder and outperformed the market over the past decade. Our Global Sustainable Equity strategy was invested in Eversource for many years, as we had a positive view of the firm's growth prospects. We took profit on the name in 2019.

Energy: Opportunity in renewable fuels as oil, gas and coal face carbon and stranded asset risk

Most of the traditional energy sector will lose out from the energy transition, as coal, oil and gas will ultimately be replaced by renewable energy. Coal demand seems to have peaked first, as demand from Western countries has declined in recent years while growth in Chinese demand is slowing. Meanwhile, demand for oil and gas has continued to grow over the past decade.

Market estimates indicate that electrification of transport could result in the peaking of oil demand around 2030. As for gas, we have seen solid demand growth in recent years, reflecting coal-to-gas switching in power generation. Gas has the advantage of being less pollutive and less CO_2-intensive while being a flexible source for power generation. Gas demand is generally expected to peak somewhere in the 2030s.

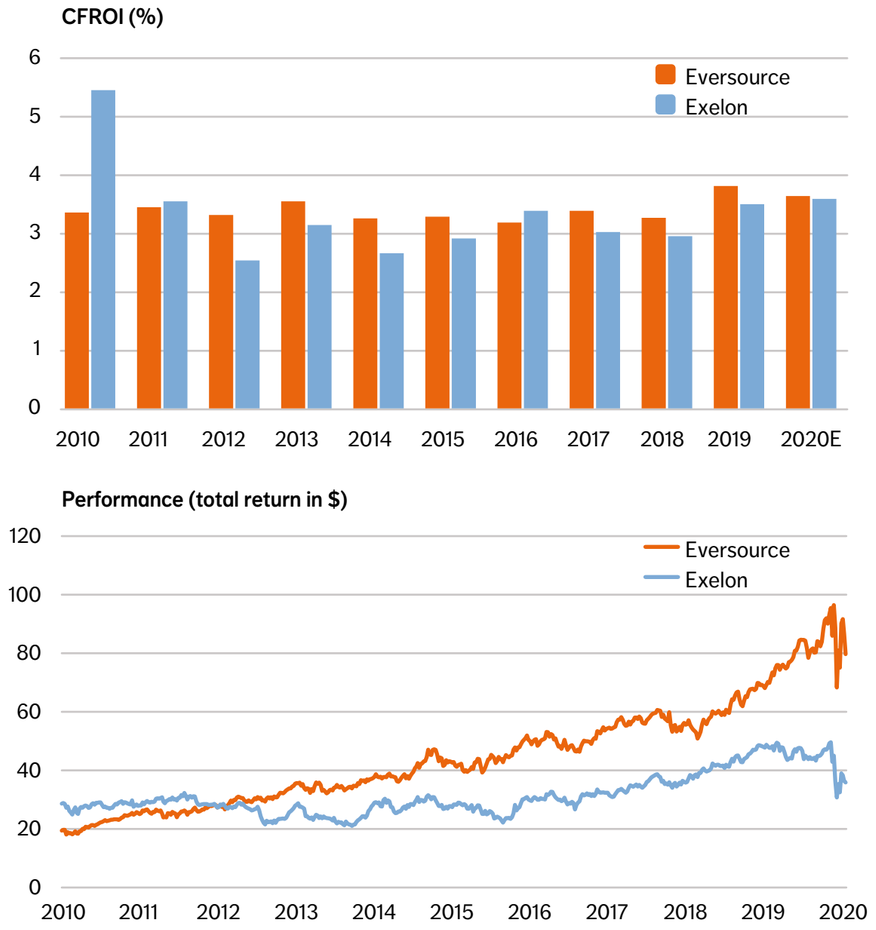
Returns on capital from upstream oil and gas production have been disappointing in recent years, as abundant and cheap US shale supply at competitive prices keeps oil prices moderated. Capital discipline has improved, resulting in better returns, but many companies still struggle to cover their cost of capital. The downstream segment has generated higher returns on capital employed, especially in the US, helped by low feedstock and electricity costs.

The growth outlook for refining and chemicals within the downstream segment seems better. It is more difficult to replace fossil fuels on a large scale, for example in plastics. Midstream oil and gas are currently enjoying volume growth driven by US shale developments and global LNG growth, but this will ultimately decline. These trends will result in stranded assets. This could be a contributor to the energy sector's continuing underperformance, which has resulted in derating relative to the market and declining importance in global market capitalisation terms (also reflected in benchmarks).

Over the past decade the global energy sector had a total equity return of just 24%, dramatically lagging the overall market, which was up 162%. This underperformance was most notable in 2014 and 2015 as oil prices fell. However, the sector also lagged in all other years except 2016, when the oil price rebounded.

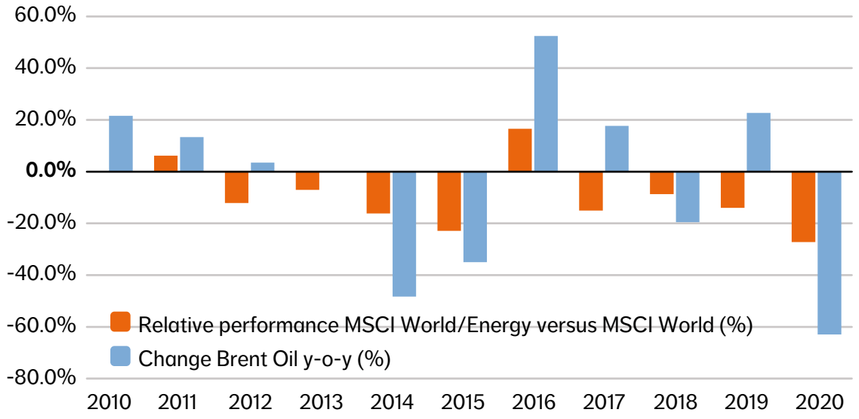
The oil price collapse following the coronavirus outbreak has triggered further weakness for oil stocks in recent months. At current oil prices, energy companies cannot afford the same capex or the high dividends that used to be set in stone. The current oversupply of oil could be a preview what could happen over the next decades as renewables increasingly replace fossil fuels.

Figure 9: Eversource's regulated networks flourish while Exelon's power profits have fallen



Source: Bloomberg, Credit Suisse HOLT, NN Investment Partners

Figure 10: The energy sector has been lagging the global markets since 2012



Source: Bloomberg, NN Investment Partners

As Figure 10 shows, since the oil price fell in 2014, the energy sector has on average failed to cover its cost of capital (HOLT: ~5% net of inflation). For 2020 the return on capital will be extremely low, reflecting the oil price collapse. Although improving capital discipline should help, the sector ultimately seems a long way from value creation. This explains its poor relative performance and limits the risk of underweighting the sector in investment portfolios.

One rare exception of an oil company that is outperforming the global equity market is Neste Oil[1]. Neste Oil's stock has strongly outperformed the energy sector (see Figure 11) as it focuses on renewable fuels, on which it earns superior returns on capital. With a capacity of 3 million tons, the firm has a 60% share of the global renewable diesel market. Renewable diesel reduces life-cycle carbon emissions by 50-90% compared with traditional diesel. Its use of more sustainable feedstock (primarily waste and residues like animal fats and used cooking oil) also boosts margins as governments incentivise CO_2 savings. In addition, Neste's feedstock flexibility provides a competitive edge, driven by a strong supply chain and pre-treatment facilities.

Neste is investing in a new Singapore refinery, which will result in a 50% expansion of its global capacity to 4.5 million tons by 2023. Most of this new capacity will be available for renewable jet fuel. It is also investing in pre-treatment capacity and its global supply chain. This expansion supports long-term growth, while the improving asset mix drives value creation. NN Investment Partners has been invested in Neste Oil since 2016. It is the only oil company in which our Sustainable and Impact Equity strategies are invested, as we have a positive view of the firm's transition efforts.[1]

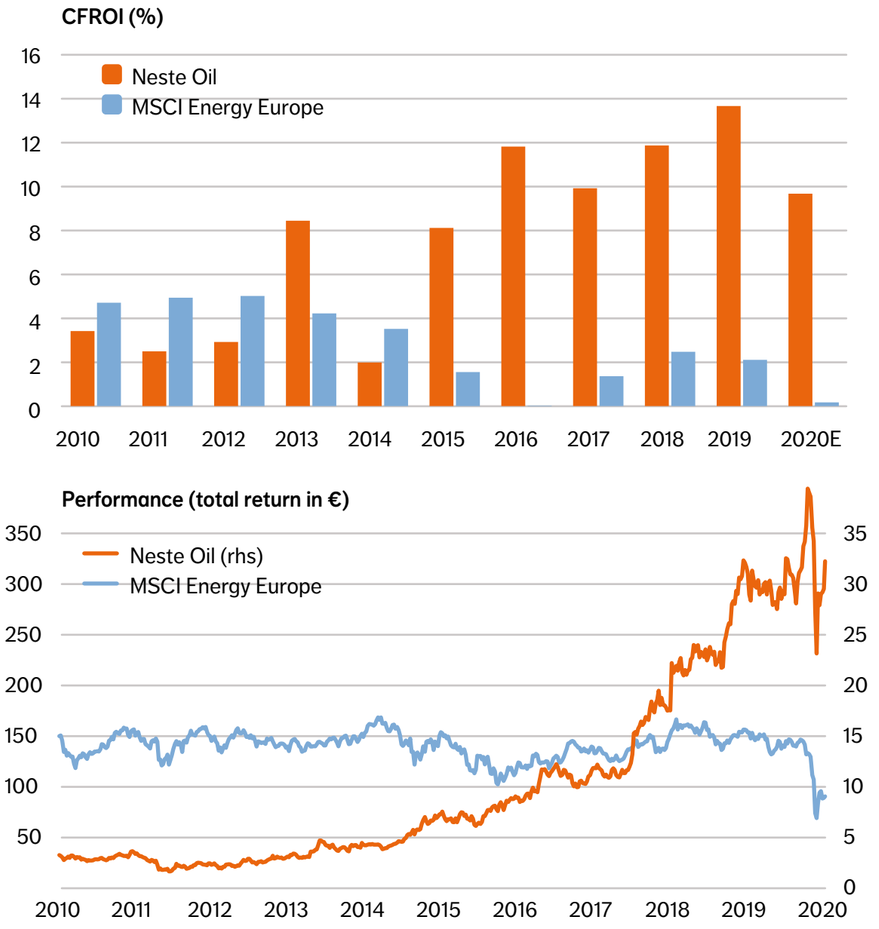
The winners of the energy transition

Despite increased political will, recent temperature and emission trends have not been encouraging. To meet the Paris climate goals, the world must massively accelerate electrification and decarbonisation. The key cause for optimism is the rapid improvement of renewables and storage economics. Companies are also increasingly important as off-takers of utility-scale wind and solar projects. Meanwhile, there is growing consumer interest in electrification and distributed generation, and cheaper batteries will reduce dependence on energy suppliers. These changes combined with further government policies will accelerate existing global trends toward renewables.

To locate the winners of the energy transition, we focus on segments and companies that offer growth opportunities coupled with an economic moat. Until recently the massive growth of the renewable power equipment segment was not accompanied by consistent returns, but some firms with strong moats have now started to emerge. Meanwhile, electrical equipment makers will still benefit from the growing need to add transmission and make distribution grids smarter, positioning several firms in this sector for financial outperformance. Utilities networks and renewables developers are benefiting from increasing investment, although returns on capital are limited by nature. Finally, oil and gas companies largely face the prospect of stranded assets as the world moves on to low-carbon alternatives, including renewable fuels.

From our research and ongoing developments in the energy sector, it is clear that the transition to renewable and sustainable energy sources is only accelerating. By remaining aware of sector-specific pitfalls while seeking out growth opportunities, equity investors can best position themselves to thrive as the energy transition progresses. In doing so, they can rest assured that their capital is being put to work to mitigate the impacts of climate change and create a more sustainable world.

Figure 11: Neste's growth in renewable fuels has boosted return on capital and stock performance



Source: Bloomberg, Credit Suisse HOLT, NN Investment Partners

Investing in the cloud: cutting emissions but not alpha

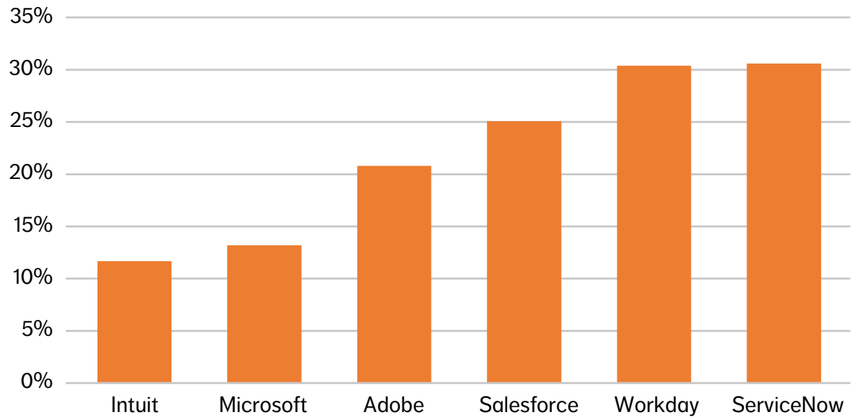
- Cloud computing is expanding massively as tech giants invest heavily in this digital transformation
- Cloud-based infrastructure leads to lower CO_2 emissions and improved energy efficiency
- Our investments in cloud computing reduce our carbon footprint while enhancing returns

The data centres enabling our always-on lifestyle consume 3% of the global electricity supply and account for 2% of greenhouse gas emissions, putting cloud computing on par with the airline industry. But where airlines face rising fuel costs and falling margins, cloud computing is stepping up energy efficiency while providing sustainable growth exposure. At NN Investment Partners, we are committed to investing in the transition towards cloud computing, which offers a smaller carbon footprint without sacrificing returns.

Traditionally, cloud computing refers to outsourcing a company's IT needs, from data and storage to software. All the servers and applications sit in the Internet "cloud," but more literally in a data centre or centres. The economic model of cloud computing lies in spreading the data centre costs by co-locating users, which leads to more efficient utilization compared with private data centres.

A secure cloud infrastructure enables innovation and offers the benefits of connectivity while guaranteeing the privacy of client data. For consumers, secure cloud computing ensures cheap, easy and safe digital participation. For enterprises, cloud computing offers many advantages: easier software updates, cheap data storage, clear savings on energy and capital expenditure, scaled processing capacity, increased collaboration potential and the ability to work from anywhere. As a result of these advantages, cloud computing giants are enjoying stellar growth rates (see Figure 1)[1].

Figure 1: Compound annual sales growth rate for selected cloud software vendors, 2018-2020E



Source: NN Investment Partners estimates (based upon company analysis)

1 For illustration purposes only. Company name, explanation and arguments are given as an example and do not represent any recommendation to buy, hold or sell the stock.

Our sustainable equity funds, such as the NN (L) Global Sustainable Equity fund[2], are well positioned to take advantage of the growth in cloud computing (for example, with holdings in companies such as Adobe, Intuit and Microsoft). These investments have had a positive impact on both our carbon footprint and alpha generation.[3] As the digital transformation continues and cloud computing becomes an ever more inescapable part of our daily lives, we project growing opportunities for investors seeking to reduce carbon emissions and still benefit from alpha generation.

Cloud computing leads to shrinking carbon footprints

Cloud computing can reduce total greenhouse gas emissions, as it is an inherently energy-efficient virtualization technique. Microsoft is a good example to illustrate the carbon benefits of cloud computing. The company is on the path to a 75% reduction in carbon emissions by 2030 relative to 2013. When taking into account renewable energy purchases, carbon emissions from Microsoft Azure (Microsoft's cloud infrastructure business) are 92% lower than traditional enterprise data centre deployments. These large savings are attributable to four key features: IT operational efficiency, IT equipment efficiency, data centre infrastructure efficiency and renewable electricity usage.

A cloud-based infrastructure is more energy-efficient than a traditional on-premises set-up. Server capacity in the data centre can scale up and down to fit fluctuating cloud computing requirements. As a result, customers use only the energy they need and don't leave oversized carbon footprints. Moreover, most major cloud operators are committed to using 100% green energy in their own data centres. So, when a company moves its IT operations into the cloud, it makes a contribution to the environmental health of the planet.

A hyperscale cloud infrastructure data centre achieves approximately 65% server utilization rates versus 15% for on-premises data centres. As a result, when companies move to the cloud, they need fewer than one quarter of the servers that they would require in an on-premises setting[4]. An average on-premises data centre is also 29% less power-efficient than a typical large-scale cloud provider that uses modern designs, cooling systems and workload-optimized equipment. Overall, customers only need 16% of the power compared to that required for on-premises infrastructure.

Research from Accenture[5] also found significant across-the-board decreases in CO_2 emissions per user for cloud-based versus on-premises delivery for three Microsoft software applications. The cloud advantage is

2 NN (L) Global Sustainable Equity is a sub-fund of NN (L), established in Luxembourg. NN (L) is duly authorised by the Commission de Surveillance du Secteur Financier (CSSF) in Luxembourg. Both the fund and sub-fund are registered with the CSSF. The prospectus and the Key Investor Information Document (KIID) (if applicable) and other legally required documents relating to the fund are available on www.nnip.com.

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4 2014 Data Center Efficiency Assessment

5 Cloud Computing and Sustainability: The Environmental Benefits of Moving to the Cloud

particularly strong for small deployments, as a small business running its own servers typically operates at a very low utilization level and may be idle for much of the day. Transitioning to cloud-based infrastructure ensures that server capacity is not wasted, leading to improved energy efficiency.

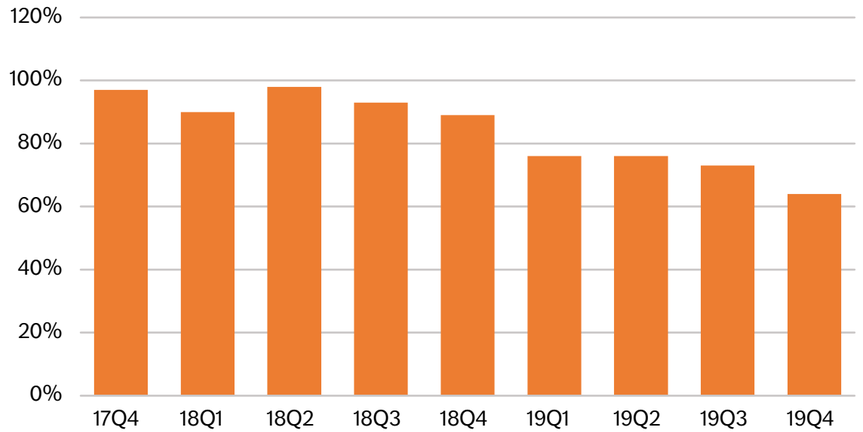
Tech giants commit to operational greenness

Energy efficiency is not the only benefit of the digital transformation. Hyper-scale cloud leaders such as Adobe, Microsoft Azure and Amazon Web Services (which provides the cloud infrastructure for Intuit) have committed to achieving 100% renewable energy usage and have already made significant strides towards that goal. Microsoft stated at the end of 2018 that half the power used by its data centers came from renewable energy and that it should hit 60% by the end of 2019. With the 60% milestone in sight, the company is now targeting over 70% renewable energy for its data centers by 2023.

Microsoft is also making further efforts to greenify its operations. The firm is aiming to cut its carbon emissions by 75% by 2030. As part of that effort, it has raised its internal carbon 'tax' to USD 15 per metric ton on all carbon emissions, nearly double the current rate for carbon emissions. Since 2012, Microsoft has enforced a carbon tax that places the financial burden on business divisions to cut their own carbon emissions.

Additionally, Microsoft's in-depth sustainability report for 2018 showed that total Scope 1, 2 and 3[6] greenhouse gas emissions fell 7.3% from 19,005,000 metric tons of CO_2 equivalent in 2017 to mtCO_2e 17,614,000 in 2018. This amounts to an absolute decrease of mtCO_2e 1,391,000 for all direct and indirect emissions. This is a strong achievement in light of Microsoft's 11% revenue growth in 2018. For comparison, Microsoft Azure has enjoyed stellar growth rates over the past few years, underpinning the impressive growth of the overall cloud computing industry (see Figure 2). Microsoft is a significant holding in the NN (L) Global Sustainable Equity fund, and through this investment, the fund has reduced its carbon footprint.

Figure 2: Microsoft Azure year-on-year sales growth rates



Source: Microsoft company filings, NN Investment Partners
Note: Microsoft's fiscal year 2019 ran from July 1 2018 to June 30 2019

6 Scope 1 emissions refer to the direct emissions from the company. Scope 2 emissions are indirect emissions stemming from the company's energy purchases. Scope 3 emissions are emissions from elsewhere in the value chain, including upstream and downstream operations.

Despite valuation and cybersecurity risks, it's greener in the cloud

Even as cloud computing opens up a world of possibilities, the transition to cloud infrastructure is not risk-free. Cloud computing stocks are currently trading at elevated valuation levels and most listed cloud software companies trade at a significant premium to the market. The latter offer above-average revenue growth, predictability and resilience, as cloud software is primarily sold on a subscription and per-seat basis. However, a slowdown in growth could have a relatively large impact on valuations.

Cybersecurity risks are also prevalent. Consumers and companies are increasingly entrusting their data to cloud computing providers, placing their faith in strong security and encryption possibilities. But keeping cloud computing simultaneously accessible and secure is a continuous challenge. Cloud companies must work to prevent security breaches and ensure that cybersecurity risks don't materialize.

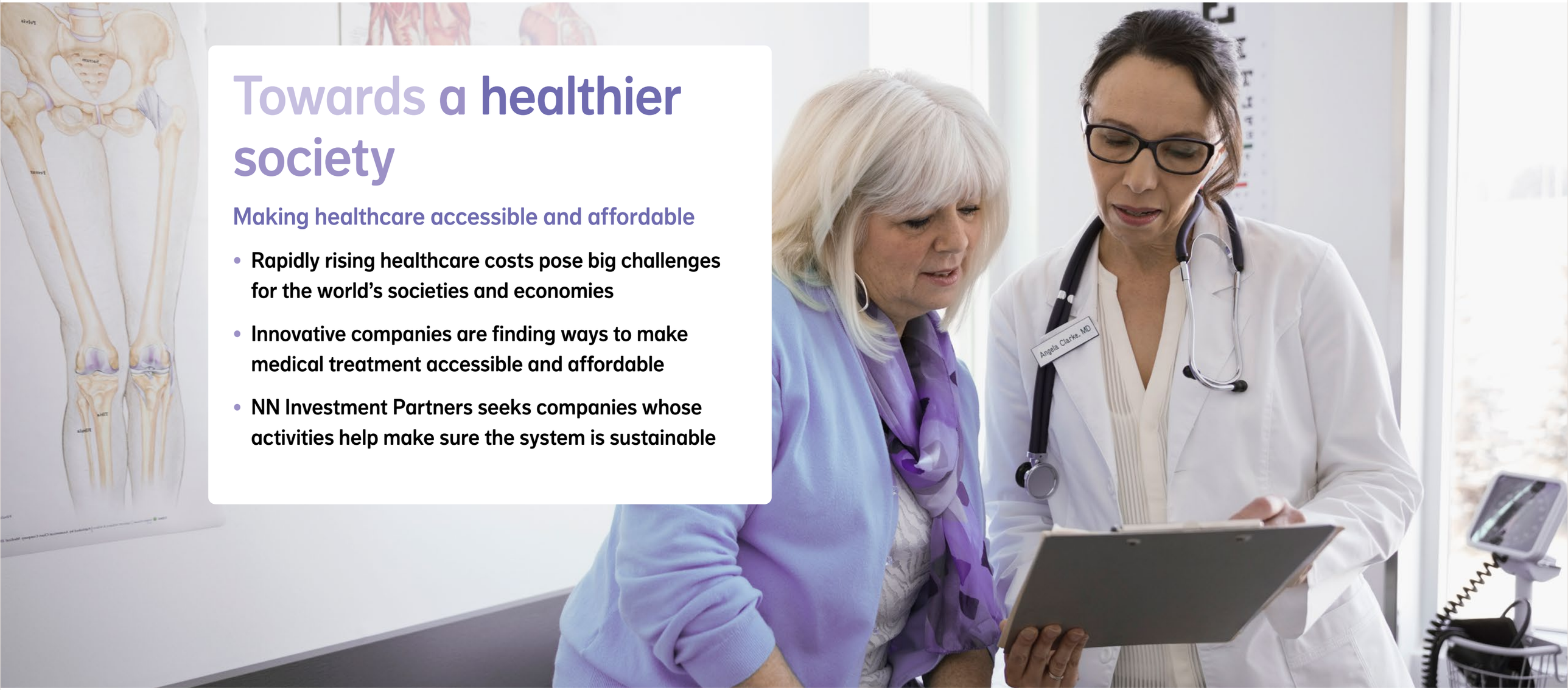
We assess these factors throughout our screening processes to ensure the fullest possible analysis of our investment decisions. Even after taking these risks into account, we still believe it's greener in the cloud. Cloud computing not only saves billions of dollars in energy costs but can also reduce carbon emissions by millions of metric tons. In our view, the digital transition offers significant opportunities for investors seeking to reduce carbon emissions and still benefit from alpha generation. Through our investments in cloud computing shares in our sustainable equity funds, we offer our clients sustainable growth exposure combined with a shrinking carbon footprint, without sacrificing returns.

We believe further opportunities lie ahead for investors seeking exposure to cloud computing. Firms such as Adobe, Intuit and Microsoft play a major role in the digital transformation of our economy. These firms are expected to gain the largest incremental percentage of IT budgets in the next three years, mainly because of the shift from on-premises workloads towards the cloud. The overall industry offers favourable growth, an attractive subscription-based business model and a positive environmental impact. And with boardrooms prioritizing cloud computing and the digital transformation, the sector as a whole looks set to grow apace for the foreseeable future.

Towards a healthier society

Making healthcare accessible and affordable

- Rapidly rising healthcare costs pose big challenges for the world's societies and economies
- Innovative companies are finding ways to make medical treatment accessible and affordable
- NN Investment Partners seeks companies whose activities help make sure the system is sustainable



NN Investment Partners looks for businesses that benefit society and that can generate a high return for shareholders. One industry that plays an especially important role in societal well-being is healthcare. In the US, the institutional complexity of the healthcare sector poses a unique set of challenges for us as investors. We seek candidates whose activities help make sure the system is sustainable by lowering overall healthcare costs. In this Insight, we look at the challenges and opportunities the healthcare industry creates for investors.

US healthcare: a high-cost market

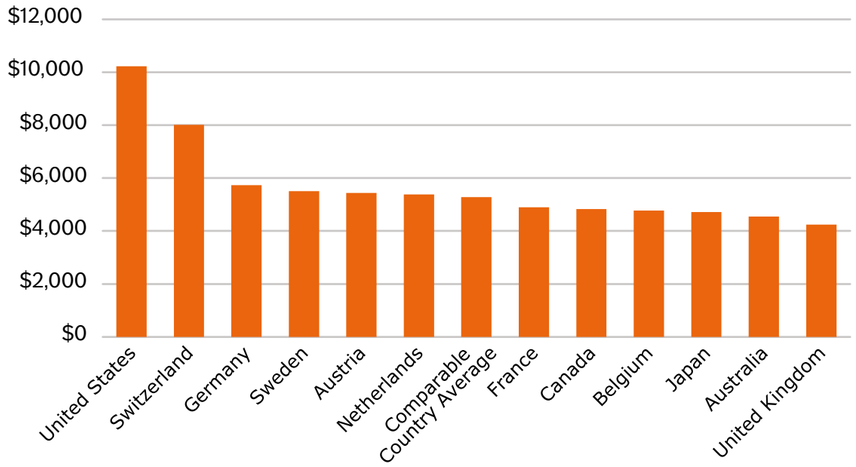
The US is the only large rich country in the world that does not have universal healthcare coverage. The country's healthcare spending as a percentage of GDP is the highest among all OECD countries and is expected to increase steadily in the coming decade. As the 2020 US elections approach, the presidential candidates are unveiling new proposals on how to fix the healthcare system.

In the six years following the 2010 passage of the Affordable Care Act, also known as Obamacare, the number of uninsured Americans fell to about 9% of the population. The number has stagnated since then, partially due to affordability or a conscious decision not to take coverage. Not everyone can afford care, and it is only getting more expensive.

Costs rising faster than GDP

The Centers of Medicare and Medicaid Services (CMS), the federal agency that administers Medicare and other government healthcare programs, projects that US national health expenditure will increase by 5.5% a year until 2027, faster than the GDP growth rate.

Figure 1: Health spending per capita (USD, PPP adjusted, 2016)

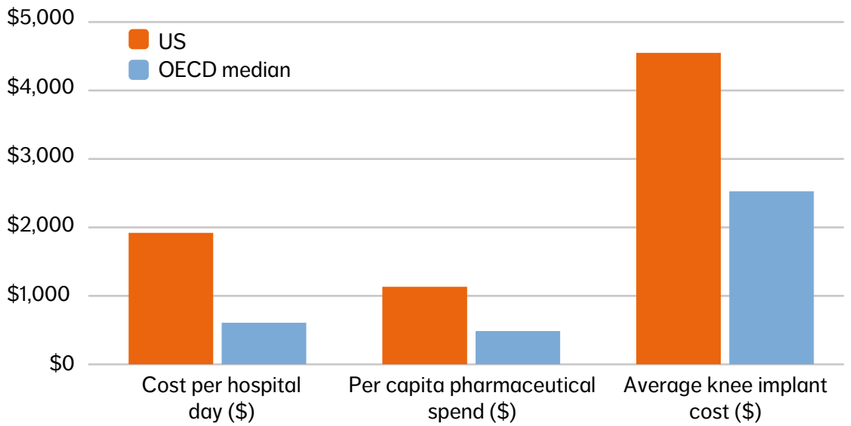


Source: KFF, OECD, National Health Expenditure data

The US now spends about 17% of GDP on healthcare, compared with an OECD average of about 11% (see Figure 1). If health expenditure outpaces GDP growth as projected, healthcare will represent an even larger proportion of the economy.

One of the most commonly cited reasons for the US's lack of universal health coverage is the costs of medical care. There are many reasons why healthcare is so expensive in the US. Drugs, medical equipment, and services are all more expensive than elsewhere in the OECD (see Figure 2). US doctors, moreover, are paid more than their peers in other countries; the medical profession forms one of the largest groups among the top 1% of American earners.

Figure 2: Costs of hospital stays, drugs and medical devices



Source: OECD, Leiyu Shi, Journal of the Royal Society of Medicine, Congressional Research (CRS) analysis of Remuneration of Health Professions, mdsalaries.blogspot.com, Bernstein analysis

Increasing demand, largely as a result of the ageing population and the fact that elderly people typically require more care than the young, is also adding to the rising costs. The number of Americans aged 65 and older is projected to more than double from 46 million today to over 98 million by 2060, increasing from 15% of the population to nearly 24%.

Innovation costs are another major price component. New drugs may represent ground-breaking science, but they carry a high price tag, such as the new $475,000 drug from Novartis, Kymriah, a CAR-T therapy treating a type of leukaemia among children and young adults. Despite high drug pricing, returns on research and development (R&D) continue to fall. Deloitte reported in 2018 that large-cap biopharma companies' R&D returns had fallen to low single digits, their lowest level in nine years[1].

Misaligned incentives for providers

Another reason why healthcare is so expensive is a misaligned incentive in the system. Healthcare professionals are paid on a fee-for-service (FFS) basis and therefore seek to maximize volumes and per-unit prices. As quality and outcome typically do not play a role in a provider's reimbursement, the FFS payment model arguably also contributes to the rising cost of healthcare.

The absence of a single-payer system in the US has resulted in a complex value chain with multiple stakeholders and programs. Traditionally, medical benefits related to hospital costs and pharmacy benefits for self-adminis-

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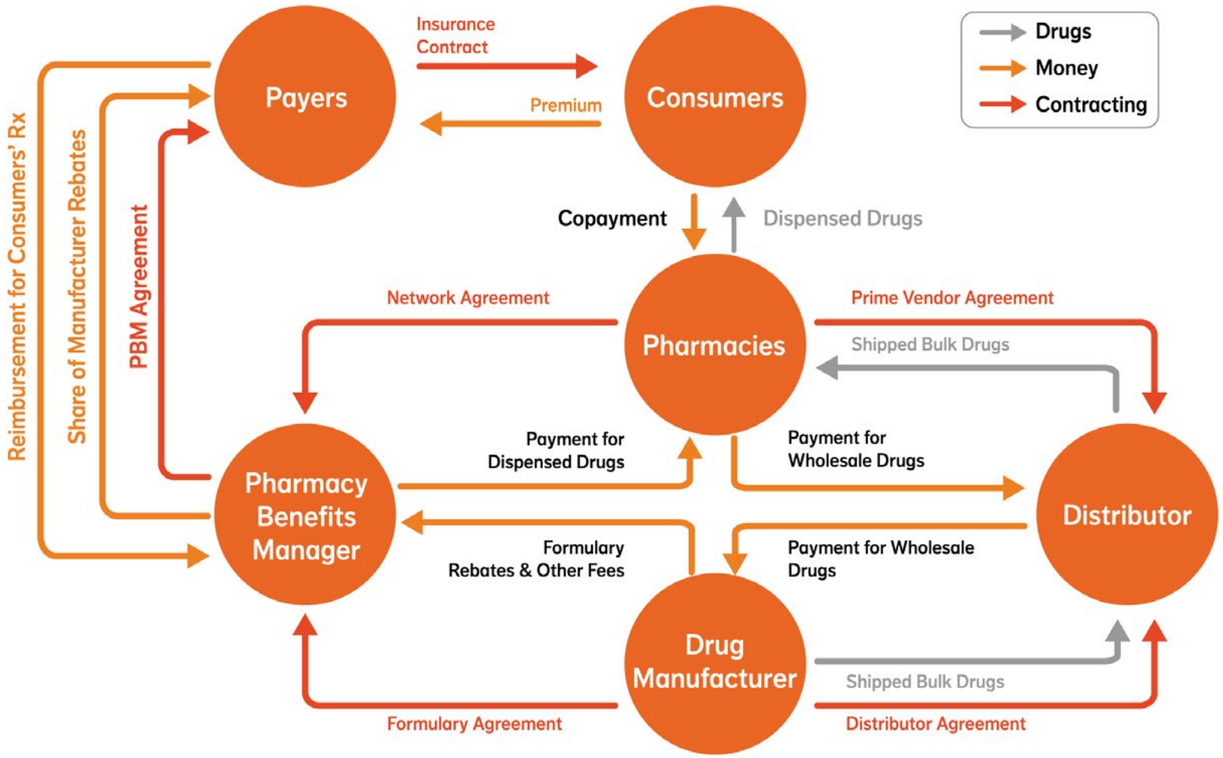
tered drugs are managed by different parties. Medical benefits, which relate to hospital costs, are administered by a Managed Care Organization (MCO) while a Pharmacy Benefits Manager (PBM) reimburses expenses for self-administered drugs. At least six different parties are involved before an end-patient receives the medication and it is paid for (see Figure 3). Multiple payers and provider networks in the US healthcare system result in potentially duplicate procedures and administrative expenses, all of which contribute to the high and still rising costs of healthcare in the US.

Figure 3: Complex procedures add to administrative expenses



Source: Jefferies

A way forward

NN Investment Partners uses environmental, social and governance (ESG) criteria when it looks for solution providers that forge a way forward for society. Portfolio candidates should be able to generate a high return for shareholders and to make sure the system is sustainable by lowering overall healthcare costs. Social aspects – the "S" in ESG – weigh especially heavily for healthcare companies, more so than for other sectors.

One of the most important ESG materiality topics for the healthcare industry as a whole is access to and affordability of healthcare. Healthcare expenditure is claiming a growing share of GDP, not only in the US but in many other countries as well. As government budgets come under increasing strain, healthcare companies need to come up with ways to ensure a sustainable system.

Healthcare varies across the world, so there is no one-size-fits-all solution. A viable business model should go beyond corporate social responsibil-

ity measures such as free medication programs. Partnering with different societal stakeholders can unite sustainability with business impact. Danish healthcare company Novo Nordisk[1], for example, is working with local organizations around the world to treat diabetes among the working poor.

Moving up- and downstream

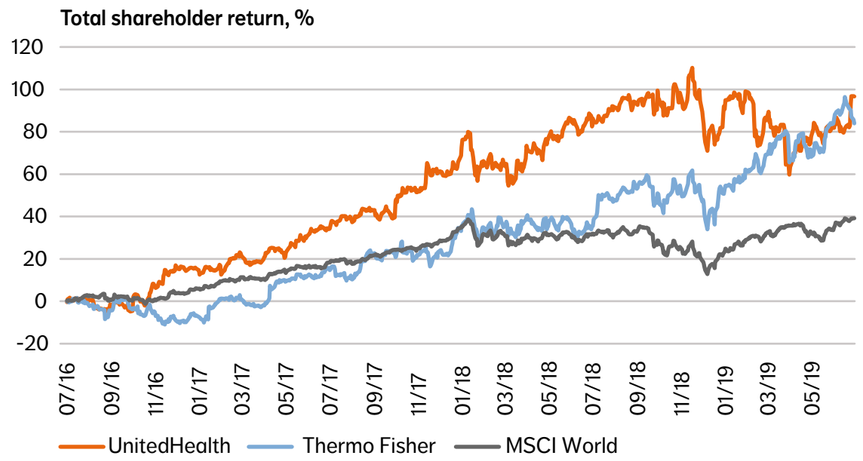
Vertical integration has been touted as a potential solution to streamline the healthcare value chain. As employers focus on the total healthcare expenditure, there is a clear trend among payors toward integrating medical costs with pharmacy costs.

Some payors, like UnitedHealth and Humana[1], have taken an extra step by going upstream and acquiring physician assets. This approach depends on the doctor to limit unnecessary visits to expensive sites of care. Others have gone downstream and combined with pharmacies, with the aim of moving patients to less expensive settings where they can undergo simple check-ups and tests, and purchase medicines as well. CVS-Aetna[1] is an example. These new business models aim to control cost increases. NN IP invests in companies that make the system more efficient by simplifying the value chain.

MCOs, the payors of the system, have been the centre of a series of multi-billion-dollar mergers involving retail pharmacies or PBMs. In the last 10 years, these combinations have generated an average cash flow return on investment (CFROI) of 20%. This measure of efficiency is double that of the overall healthcare industry.

Going forward, MCOs are likely to be on the right side of healthcare reforms, driving innovation and managing costs. UnitedHealth, the largest MCO in the US serving 46 million members, combined its health insurance and pharmacy benefit roles back in 2011, kick-starting the trend of vertical integration. This forward-looking strategy has translated to strong stock price performance, giving a total return of over 95% in a three-year period, outperforming the MSCI World Index's return of about 40% (see Figure 4).

Figure 4: UnitedHealth, Thermo Fisher shareholder returns



Source: Bloomberg

Making the outcome matter

New payment models such as value-based care (VBC) should help align incentives across the value chain. VBC, a pioneering payment model where not only the cost of care matters but also the outcome, is seen as a more efficient way of delivering care and saving costs.

Despite the provisions of the Affordable Care Act, the transition from FFS to VBC remains slow and incomplete. Some interim mechanisms, such as bundling payments and allowing providers to keep the excess of reimbursement rates, do exist. UnitedHealth hires 36,000 physicians to drive aligned incentives and the transition to VBC.

Applying the right incentives should reduce unnecessary utilization and help keep health plans affordable and accessible to the general public. WellMed[1], a UnitedHealth physician practice and clinic network operating in Texas and Florida, achieved a 42% decrease in hospital admissions for their Medicare patients, offering hope that better outcomes and lower costs can co-exist.

Life sciences: enabling innovation

Life science tools and services are an important subsector in enabling innovation and enhancing efficiency in the academic and biopharma field. Providers in this field supply cutting-edge equipment, consumables, and services to accelerate their client's activities and to increase their productivity in R&D, manufacturing, and laboratory testing.

Thermo Fisher Scientific[1] is the world life sciences leader with USD 24 billion in annual revenue. Some 80% of that total is from clients in the healthcare market. For example, Novartis's Kymriah, a CAR-T leukaemia therapy, is enabled and supported by Thermo Fisher's cell therapy systems (CTS) product. Thermo Fisher's CFROI in the past 10 years has been in an enviable range of 18-32%, compared with 11-16% for its rivals. The company's stock price rose more than 85% in the last three years, double the MSCI World's returns (see Figure 4).

Contract research organizations (CRO) run clinical trials and provide outsourced R&D services to biopharma companies. Their more flexible business models facilitate innovation by bringing potentially life-saving drugs to patients for whom all other therapies have often failed. An example is PRA Health Sciences[1], a leading global CRO and owner of Symphony Health, the world's second-largest healthcare data company. PRA's data and analytics capabilities in patient recruitment help reduce drug development costs and bring drugs more quickly to the market. They have made a 27-62% CFROI since 2012, compared with 12-17% for their peer group.

Tackling diabetes

Making therapies available to an ageing population contributes to a healthier and more prosperous society. Treating diabetes is a direct solution to an ageing population. NN IP sees opportunities in companies with an established track record in diabetes care. Based in Denmark, Novo Nordisk has been manufacturing and selling anti-diabetic products for over 95 years. The company makes insulin and other medications available in more than 170 countries. Novo Nordisk is waiting for regulatory approval of oral semaglutide, an innovative pill with unprecedented efficacy in controlling blood glucose level. In the last 10 years, the company has generated a high and stable CFROI in the 15-25% range, roughly double the 8-11% of its big pharma peers.

Novo Nordisk's "Base of the Pyramid" initiative program specifically targets diabetes among the working poor, a group comprising more than 1 billion people that earn less than USD 10 a day. The initiative involves the development of a scalable and sustainable solution to increase access to diabetes care in developing countries by partnering with local governments, religious organizations, and hospitals. The company is committed to an access-to-in-

sulin policy. It sells human insulin at a maximum of USD 4 per 10-milliliter vial in 78 low- to middle-income countries, where it reached about 5 million people in 2018.

Coming to grips with Covid-19

The spread of the coronavirus and the outbreak of the Covid-19 pandemic have further exposed the flaws in healthcare coverage. More than 1,000 trials are underway for products to treat Covid-19 patients. While some look promising, price might be a constraint. Some of these drugs being repurposed have been approved for other indications and are selling at thousands of US dollars per course. We are less optimistic about vaccines; as of the time of writing, no vaccine for the corona family of viruses has ever been approved.

NN IP's sustainable equity strategies generally do not have much exposure to pharma and biotech companies. We prefer the companies that indirectly benefit from those biopharma companies by selling the hardware used in R&D and in the manufacturing of drugs and vaccines, or even by providing biopharma and medtech companies with a contract manufacturing service.

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Koen Oussoren
Experience since 2016

Doug Hatfield
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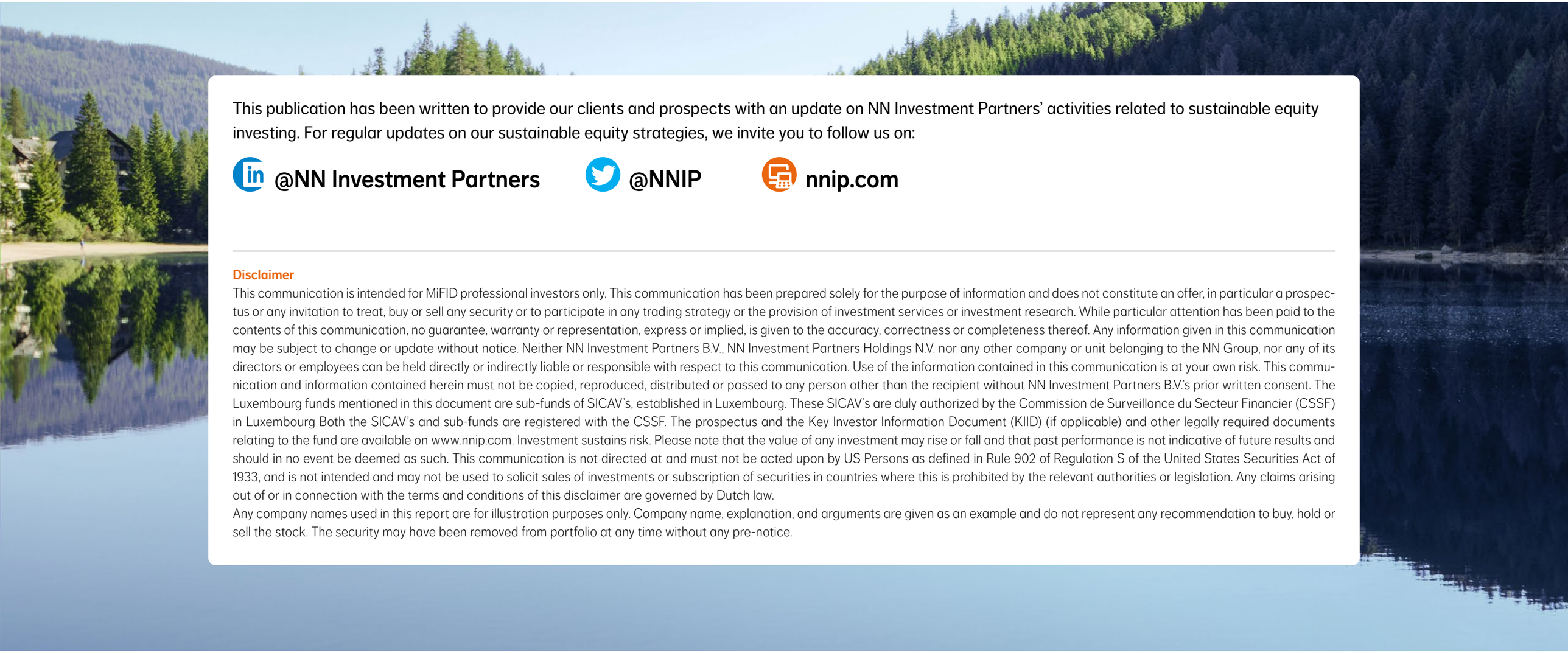

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